UKKW 2024

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ABSTRACTS
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Contents

Poster number:001

Submission number: 201

The treatment and management of moderate-to-severe chronic kidney disease-associated pruritus in adult patients receiving in-centre haemodialysis in England: Clinician perspectives on treatment options and priorities.

Mrs Nitasha Vekaria-Shah[1], Doctor Jyoti Baharani[2], Professor James Burton[3], Professor Philip Kalra[4], Doctor Kieran McCafferty[5], Professor Sandip Mitra[6]

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Mrs Nitasha Vekaria-Shah

Biography

Nitasha Vekaria is the Medical Lead for Nephrology at CSL Vifor Pharma Ltd. She is a registered pharmacist, graduating from Aston University with a Masters in Pharmacy in 2010.

Abstract

INTRODUCTION:

Chronic kidney disease-associated pruritus (CKD-aP) is a serious systemic itch comorbidity prevalent in CKD patients, especially in those undergoing dialysis. CKD-aP is associated with sleep disturbance and poor health-related quality of life (QoL), as well as increased risks of infection and hospitalisation, according to Dialysis Outcomes and Practice Patterns Study analysis (1).

Difelikefalin▼ has been demonstrated to be an efficacious treatment for moderate-to-severe CKD-aP in two Phase 3 trials: KALM-1 and KALM-2 (2, 3). The objective of this study was to investigate through a clinician perspective what the current management of CKD-aP looks like in England, as well as to understand treatment priorities and how difelikefalin may shape this landscape.

METHODS:

During March and April 2022, a three-stage modified Delphi panel was conducted to investigate CKD-aP management in England. Stage 1 involved individual interviews, while Stages 2 and 3 comprised group

calls with the entire panel to consolidate their feedback. 8 Consultant nephrologists participated in all stages.

RESULTS:

The panel members confirmed that available guidelines are often written by specialists not involved in the direct management of CKD, covering pruritus as the symptom from a primary skin disease; this renders them largely inapplicable to CKD-aP specifically. As a result, there was significant variability in the treatments prescribed by kidney Consultants. Current management techniques included ensuring adequate dialysis and optimising the calcium-phosphate balance before employing best supportive care (BSC) treatments. BSC included creams and emollients, antihistamines, gabapentin, and in some cases pregabalin or antidepressants. Although the panel noted some benefits of current therapies, some limitations were named, such as: slow onset of action of treatment; poor ease of administration; associated treatment burden (i.e., side effects), and a lack of efficacy. Panel members generally prioritised treatment for those whose CKD-aP significantly affected their QoL or mental health, or where itching had a profound impact on sleep.

The panel members agreed that the KALM studies were high quality. In terms of difelikefalin's effect on QoL, the panel noted that the impact seen in KALM-2 was significant and that it was likely to reflect real-world experiences. Although some clinicians pointed out the study population may differ from the population in a dialysis unit, there was agreement that the study populations were broadly generalisable to the UK population.

Clinicians noted that they would like to be able to use difelikefalin early in cases of severe itch, with an average of 82% of severe CKD-aP patients being considered eligible for early treatment.

DISCUSSION:

This study underscores the lack of guidelines and consistent approaches for managing CKD-aP, revealing dissatisfaction among clinicians with the treatment options available. Creams and emollients, antihistamines, and gabapentin are among the treatments used, but all come with benefits and limitations. Clinicians prioritised treating patients whose CKD-aP significantly affected their quality of life, mental health, and sleep.

Since the modified Delphi took place in 2022, difelikefalin has been approved for the treatment of moderate-to-severe CKD-aP for CKD patients on haemodialysis in England. Current clinical practice may change as a result of this decision.

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Poster number: 002

Submission number: 221

Comprehensive kidney care: adopting principles of comprehensive geriatric assessment within an advanced kidney care clinic

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Biography
Dr Patricio Abarca Sanhueza (MBBS, MRCP, PGCert Medical and Health Education) is a Chilean Medical graduate and currently Internal Medicine trainee at the North West NHS England Deanery. He plans to pursue a career in both Renal and Intensive Care Medicine and is currently involved in Nephrology projects at the Royal Preston Hospital.

Abstract

Introduction: Chronic Kidney Disease (CKD) is increasingly prevalent among older people, a trend that presents significant healthcare challenges. This project introduces the Comprehensive Kidney Care (CKC) clinic model which incorporates elements from Comprehensive Geriatric Assessment within the Advanced Kidney Care clinic. By focusing on a holistic care, this model aims to enhance symptom management, facilitate appropriate referrals, improve documentation, and offer advance care planning (ACP), ultimately to improve care quality for older people with advanced CKD.

Methods: We evaluated 27 patients ≥65 years old with CKD stage 4 and 5, attending the CKC clinic between 23/11/2022 and 22/11/2023. Demographics and clinical characteristics were recorded, including Charlson Comorbidity Index (CCI). Individual symptoms and total score were screened in each clinic using the Integrated Palliative Outcome Score (IPOS)-Renal Symptom Survey. Geriatric impairments were assessed including frailty (Clinical Frailty Scale [CFS]), mobility, polypharmacy (≥5 medications), activities of daily living (ADLs), falls and cognition. Actions were documented, including initiation of ACP discussions and other relevant interventions.

Results: Patients' average age was 82 (SD 5.8), they were predominantly male (20 patients, 74%) and had a median eGFR of 18ml/min/1.73 m^2 (IQR 10). They exhibited a high burden of comorbidities (CCI mean 8.4, SD 2) and a high prevalence of geriatric impairments: 74% (20 patients) had a CFS score ≥4, 63% (17) required mobility aids, 26% (7) reported falls, 30% (8) required assistance with ADLs, and all had polypharmacy. IPOS was recorded for 20 patients. Mean total score was 10.25 (IQR 8). Figure 1 demonstrates the symptoms reported as experienced 'moderately' or worse at first IPOS completion. Thirteen patients had more than one IPOS completed, allowing each symptom to be compared at two consecutive clinic attendances 239 times. Symptom improvement was more common than worsening (37 [15.5%] versus 11 [4.6%]). Most times symptoms remained stable (43, 18%) or were absent (132, 55.2%), with a minority appearing 16 times (6.7%). Seventeen relevant actions were identified, including

symptom management (14 patients, 51.9%), physical activity advice (7, 25.9%), referrals to other teams (12, 44.4%; 2 referred to more than one), including dietitian (4), psychology (3), frailty team (2), physiotherapy (2), memory assessment clinic, social care, falls clinic and palliative care (1 each). Preferred kidney management was discussed with 9 patients (33%); 9 patients had documented preferences before attending the CKC clinic. Ten (37%) preferred conservative care, 4 (15%) haemodialysis and 13 (48%) remained undecided. Undecided patients had a significantly higher eGFR (median 21 [IQR 4] versus 12 ml/min/1.73 m^2 [IQR 6.75], p-value 0.012). ACP was discussed with 8 patients; these patients had higher CFS scores (median 6 versus 4, IQR 1.25, p-value 0.005) and higher ADL dependence (Odds ratio 8.9, p-value 0.026).

Discussion: The CKC clinic model shows promise as an effective approach for assessing and managing older people with advanced CKD. Most times symptoms improved or remained unchanged, suggesting actions were effective at managing symptom burden. ACP discussions were more commonly initiated in patients with higher frailty severity and ADL dependence; obtaining geriatric impairment information may help prompt ACP discussions.

Figure 1. Frequency of symptoms reported as experienced 'moderately' or worse at first IPOS completion
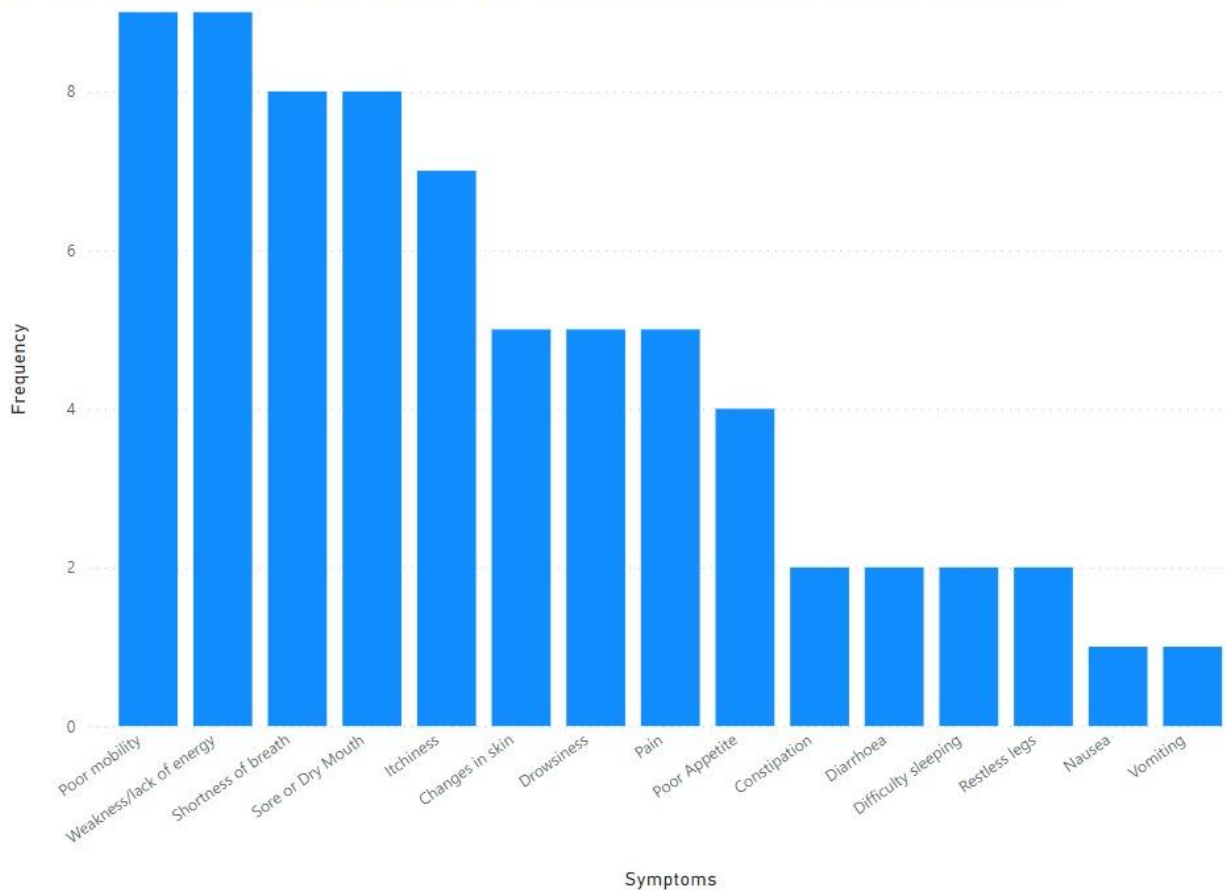
Poster number: 003

Submission number: 224

Accelerated advanced kidney care clinic – a pilot project

Dr Andrea Cove-Smith, <u>Dr Seham Radwan</u>, Katherine Price, Gladys Laurente

Royal London Hospital, London

Biography
Dr Cove-Smith is a consultant nephrologist in Barts Health NHS Trust, based at Royal London Hospital. She has a special interest in CKD and GN.

Abstract

Introduction: Despite efforts to improve early identification of CKD[i], as well as new therapeutic interventions that can delay its progression[ii], there are still significant numbers of people presenting to nephrology services with advanced CKD. Traditionally these 'late-presenters' have poorer outcomes; they are less likely to be established on home therapies and have a higher mortality rate. In East London around 30% of new starters on RRT fit into this category, which is in keeping with published data[iii]. We designed an accelerated outpatient pathway to provide intense education and support for this group of patients, to determine whether their outcomes could be improved.

Methods: Patients presenting to service with an eGFR <10ml/min (with no reversible cause) and/or deemed likely to require RRT within 90 days were triaged to the accelerated pathway. The service was delivered by a band 7 physician associate and band 6 AKCC CNS with support from a consultant. Patients were seen frequently to provide education about their diagnosis and RRT options, as well as monitoring and modifying risks factors. Care was coordinated by the PA and CNS, who linked with surgeons, dieticians and psychology services where needed.

Results: 35 patients fitted the criteria within the 6 month pilot phase; 21 male, 9 female, with a mean age of 55 years. 34% were Asian, 31% black and 20% white (in keeping with the local RRT cohort). Average eGFR at referral was 8ml/min. 16 patients (46%) chose HD, 15 (43%) chose PD, and 4 (11%) chose supportive care. Of those who commenced HD, 5 (31%) commenced via a functioning AVF. 1 patient has been successfully transplanted and 4 others are active on the transplant list. 1 patient sadly died after commencing HD.

Discussion: Having a dedicated pathway for these patients improved uptake of home-based therapy and reduced length of hospital stay compared to a historical cohort. Managing them separately from the general AKCC population enabled a focus on intense education and decision support, acknowledging the shock that comes with a new diagnosis of ESKD. The complementary skill sets of an experienced AKCC nurse and a physician associate with close links to other aspects of the renal service were key to delivering improved outcomes.

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Poster number: 004

Submission number: 250

An evaluation of guideline-based and age-adapted thresholds for older people with chronic kidney disease using routine population health data

Dr Haya Deeb[1], Dr Ping Liu[2], Dr Mintu Nath[1], Prof Pietro Ravani[2], Dr Simon Sawnhey[1]

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[2]Cumming School of Medicine, University of Calgary, Alberta, Canada.

Biography
Dr Haya Deeb. GMC Registered Junior Doctor MSc Student Health Data Science, University of Aberdeen
Research Data Assistant, University of Edinburgh

Abstract

Introduction: Traditionally, kidney function is considered to be "impaired" when the estimated glomerular filtration rate (eGFR) falls below 60 ml/min/1.73m^2. This is contested because kidney function declines with age and some clinicians question whether mild kidney impairment in the elderly should be considered a disease. An age-adapted threshold eGFR of <45 has been proposed for those aged over 65 years who do not have albuminuria but are not commonly used. We examined the prevalence and outcomes of elderly people with mild kidney disease (eGFR 45-59).

We report the characteristics and outcomes of a population cohort aged >=65 with prevalent eGFR 45-59 and without albuminuria (i.e. who meet guideline-based criteria for kidney disease, but would not meet age-adapted criteria), and compared them with those aged >=65 with eGFR 30-44 (i.e. kidney disease based on any criteria), and eGFR 60-74 (i.e. kidney disease on no criteria).

Methods: This analysis covered 81,199 Scottish residents aged >=65 who received kidney function monitoring between January 2013 and December 2014, and were alive on 1st January 2015. Follow-up was from 2015, for 5 years, to 2020. Outcomes included death, sustained (90 days) kidney progression to CKD stage G4/5, new-onset cardiovascular disease, chronic pulmonary disease, cancer, and dementia (i.e. covering kidney disease and the top four reported causes of death in the UK). Respective outcomes were based on validated CKD progression algorithms, or validated ICD-10 codes for admissions and multiple cause of death records. Analyses included cause-specific models for disease-specific events/deaths and death of other causes as a competing risk, adjusted for age, sex, and morbidities at baseline

Results: Of 81,199 older adults with kidney monitoring during the observation period, 18,359 had an eGFR <60, of which 14,832 did not have A2/3 albuminuria. 10,513 (57.3%) had mild impairment (eGFR 45-59 without albuminuria) and would not be considered to have kidney disease if age-adapted thresholds were used. Cumulative incidence plots showed that those with mild kidney disease (eGFR 45-59 vs 60-74) had increased mortality, progression to CKD stage G4/5, new cardiovascular disease, and dementia (see figure). For this group, the absolute risks of progression to more severe CKD stage 4 were

low (2%). Excess cardiovascular and dementia outcomes were partially explained by pre-existing comorbidities leading to attenuation of adjusted cause-specific hazard ratios (see table).

Discussion: Most elderly people with mild kidney disease (eGFR 45-59 without albuminuria) have broadly increased health risks including kidney disease, and more commonly reported causes of death such as cardiovascular disease and dementia. Even so, very few have substantive progression to more advanced CKD stages. This information can inform holistic discussions and secondary prevention for older people with mild kidney disease in the community.
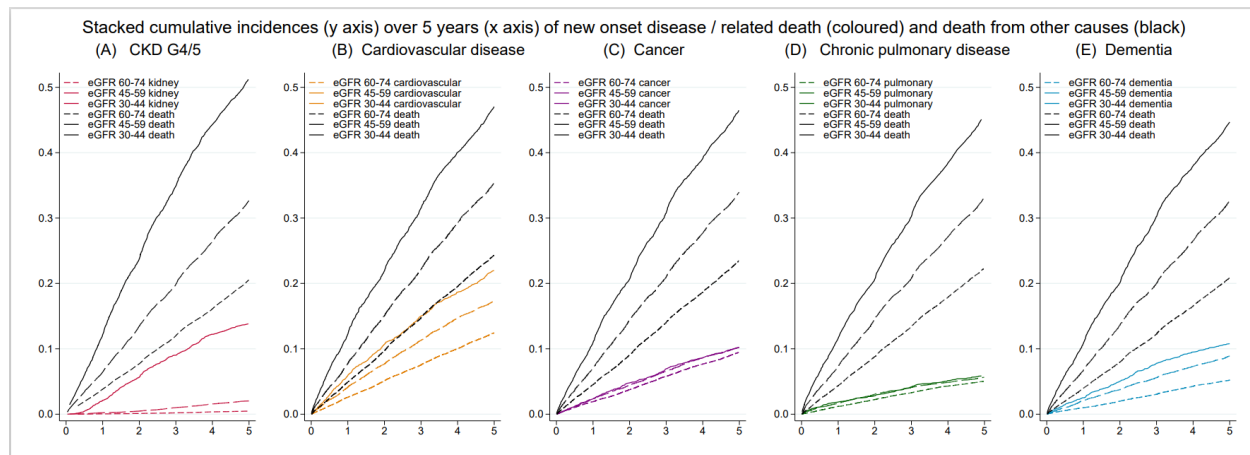
Abstract - Figure: Stacked Cumulative incidences over 5 years of new onset disease/related death (Coloured lines) and death from Other causes (Black lines)

Five year clinical outcomes	eGFR 60-74 no albuminuria n=20332			eGFR 45-59 no albuminuria n=10513			eGFR 30-44 no albuminuria n=3740		
	%	csHR	95% CI	%	csHR	95% CI	%	csHR	95% CI
all cause mortality	(20.3)	1	(ref)	(31.7)	1.12	(1.07-1.17)	(44.2)	1.34	(1.26-1.42)
new CKD G4/5 or related death*	(0.5)	1	(ref)	(2.0)	4.01	(3.14-5.12)	(13.9)	29.30	(23.3-36.8)
new cardiovascular or related death*	(12.4)	1	(ref)	(17.3)	1.15	(1.08-1.24)	(22.0)	1.35	(1.23-1.48)
new cancer or related death*	(9.4)	1	(ref)	(10.2)	1.06	(0.97-1.15)	(10.2)	1.11	(0.99-1.26)
new COPD or related death*	(5.0)	1	(ref)	(5.6)	1.20	(1.07-1.34)	(5.9)	1.36	(1.15-1.60)
new dementia or related death*	(5.2)	1	(ref)	(8.9)	1.18	(1.08-1.29)	(10.8)	1.18	(1.04-1.33)

*new onset disease specific outcomes among those without a prior history
eGFR= estimated glomerular filtration (CKD-EPI)
csHR= age, sex, morbidity adjusted cause specific hazard ratio
95% CI = 95% confidence interval
CKD G4/5 = progression to sustained CKD stage G4/5 based on previously validated algorithm

Abstract- Table: Adjusted cause-specific hazard ratios for the 5-year clinical outcomes.

Poster number: 005

Submission number: 252

The impact of VEGF signalling pathway inhibitors and/or immune checkpoint inhibitors on renal-specific outcomes in people with kidney cancer

Dr Benjamin Elyan[1,2], Mr James Hedley[3], Dr Michael Sullivan[1,2], Dr Nicole De La Mata[3], Professor Angela Webster[3,4], Dr Balaji Venugopal[5,6], Professor Rob Jones[5,6], Professor Ninian Lang[1,2], Professor Patrick Mark[1,2], Dr Jennifer Lees[1,2]

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[2]NHS Greater Glasgow and Clyde, Queen Elizabeth University Hospital.
[3]Collaborative Centre for Organ Donation Evidence, University of Sydney.
[4]Centre for Transplant and Renal Research, Westmead Hospital.
[5]School of Cancer Sciences, University of Glasgow.
[6]NHS Greater Glasgow and Clyde, Beatson West of Scotland Cancer Centre

Biography
Dr Benjamin Elyan. Clinical research fellow in renal medicine at University of Glasgow and honorary nephrology registrar at Queen Elizabeth University Hospital, Glasgow.

Abstract

Introduction: Treatment with vascular endothelial growth factor signalling pathway inhibitors (VSPI) and immune checkpoint inhibitors (ICI) has transformed outcomes in advanced kidney cancer. VSPI and ICI can both independently cause side effects that are risk factors for the development or progression of chronic kidney disease (CKD). We analysed the estimated glomerular filtration rate (eGFR) decline in people with kidney cancer following treatment with VSPI or ICI.

Methods: We linked routine healthcare databases in the West of Scotland, UK (spanning 2010–2020, population 1.4 million) to identify adults with advanced kidney cancer who received a VSPI and/or ICI. The following outcomes were studied using competing risk regression considering the competing risk of death: 40% decline in eGFR, de-novo proteinuria (urine albumin creatinine ratio >3mg/mmol), and progression to eGFR <15 mL/min/1.73m^2. The risk of all-cause mortality was estimated with Cox regression models. In the two years following therapy initiation, eGFR slope (defined as annualised rate of change in eGFR) was modelled using linear mixed-effects models for the whole group and subgroups of people who had nephrectomy, metastatic cancer and a baseline eGFR <60mL/min/1.73m² prior to systemic therapy.

Results: We studied 357 adults (62.5% male; median age 63.0 years, IQI 55.0-71.0) with kidney cancer who were treated with either VSPI and/or ICI. The median baseline eGFR before systemic therapy was 74.6mL/min/1.73m² (58.3 - 91.9) and most received VSPI monotherapy (86.0%).

A ≥40% decline in eGFR occurred in 82 people (23.0%) within one year of starting systemic therapy. People with diabetes were more likely to experience a ≥40% decline in eGFR (subdistribution HR 1.89:

95% CI 1.05-3.41, p = 0.04). A decline in eGFR to <15mL/min/1.73m² or kidney failure with replacement therapy was found in 4 (1.1%) people. Among the 75 people assessed for proteinuria, 30.2% developed de-novo microalbuminuria. Median overall survival was 1.36 years (IQI 1.11-1.75 years), but this was longer in people who had nephrectomy prior to systemic therapy: 2.13 years (IQI 1.82 – 2.57 years). A 40% acute or chronic decline in eGFR was not associated with increased hazards of death on univariable or multivariable analysis (adjusted HR: 1.11: 95% CI 0.85-1.46, p=0.4).

On average, eGFR remained relatively stable over time (average increase +1.03mL/min/1.73m²/year: 95% CI -1.64 to +3.70, p = 0.2). People who had nephrectomy before systemic therapy demonstrated the largest average increase in eGFR (+2.30mL/min/1.73m²/year: 95% CI -1.66 to + 6.26). People with baseline eGFR <60mL/min/1.73m² prior to systemic therapy had a small decline (-1.02mL/min/1.73m²/year: 95% CI -6.55 to +4.50) in eGFR (Figure 1).

Discussion: Despite case series and prescribing guidelines highlighting adverse impact of VSPI/ICI therapy on kidney function, our results demonstrate that there is no significant impact on the average change in eGFR but highlights that people with diabetes are at higher risk of clinically significant renal events. With appropriate monitoring, more widespread use of these agents in patients with renal impairment may be warranted.
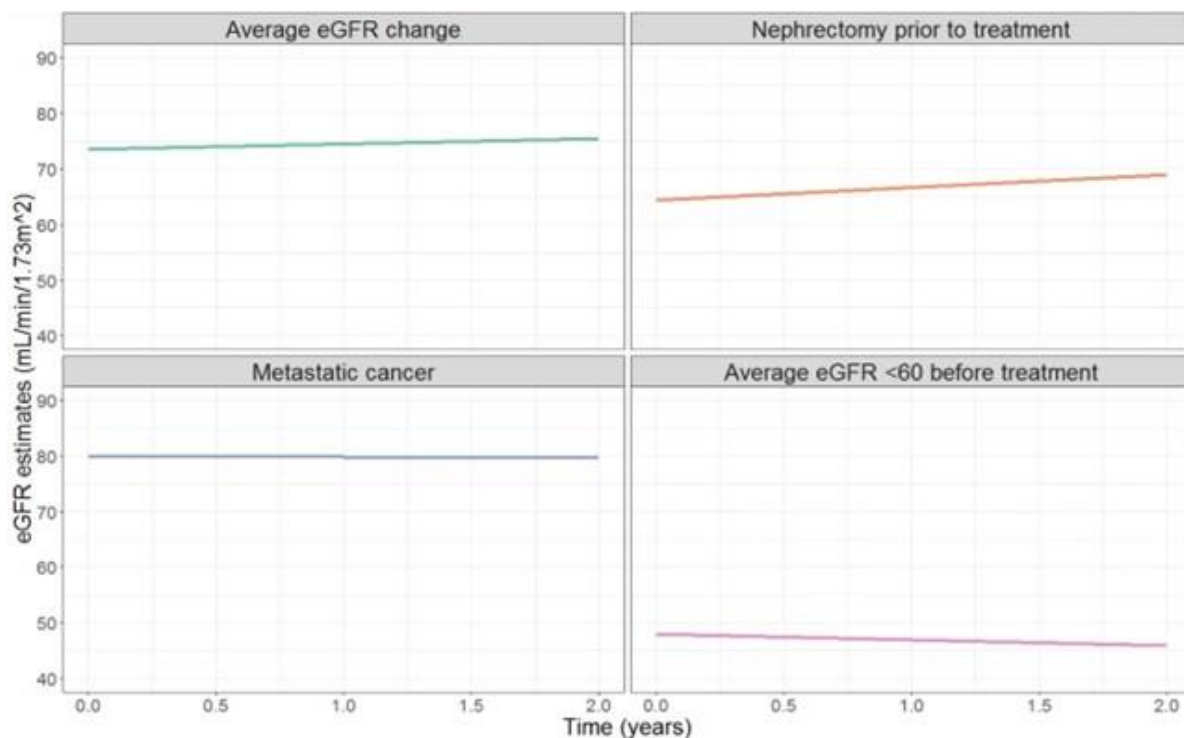
Figure 1: Plot of eGFR slope estimates over time of people with advanced kidney cancer treated with VEGF-signalling pathway inhibitors and/or immune checkpoint inhibitors from the point of systemic therapy to 2 years from follow-up. This demonstrated as the average eGFR change, and specifically for people who had nephrectomy prior to systemic therapy, metastatic cancer at the point of diagnosis and an average eGFR <60ml/min/1.73² before systemic therapy.

Poster number: 006

Submission number: 384

eGFR Slope Correlations, CKD Aetiology and Risk Modelling

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Biography
Oskar Ålund. PhD in computational mathematics from Linköping University. Currently a postdoc at AstraZeneca working on CKD risk modelling.

Abstract

Introduction: Commonly used CKD risk models such as the Kidney Failure Risk Equation (KFRE)[1] do not take into account disease aetiology and have been shown to overestimate risk[2]. Meanwhile there is evidence that the progression profile (and consequently the quality of risk predictions) in CKD patients varies with aetiology[3]. In this work we explore the connection between CKD aetiology, disease progression, and risk modelling.

Methods: Using data from the UK's NURTuRE-CKD cohort[4] with data from 2999 patients we computed Spearman correlations between 47 different biomarkers/clinical parameters and eGFR slope across the following aetiologies: Glomerulonephritis (N=694), Hereditary/Cystic (N=354), Diabetic (N=344), Vascular (N=298), and Other (N=976). We also fitted Cox models for each disease group.

Results: The top ten eGFR slope correlations (by absolute value) for each aetiology are shown in Figure 1. Although U-ACR, P-KIM-1 and U-Clusterin appear high on the list in most aetiologies, markers of progression as measured by eGFR slope vary significantly across disease groups. In particular, the risk marker profile of hereditary/cystic diseases is unique in not having UACR as the top correlating marker. This has striking consequences for risk modelling—while we saw small improvements over the KFRE in all disease groups using disease group specific Cox models—a custom Cox model based on eGFR and P-KIM-1 significantly outperformed the KFRE on the hereditary/cystic group.
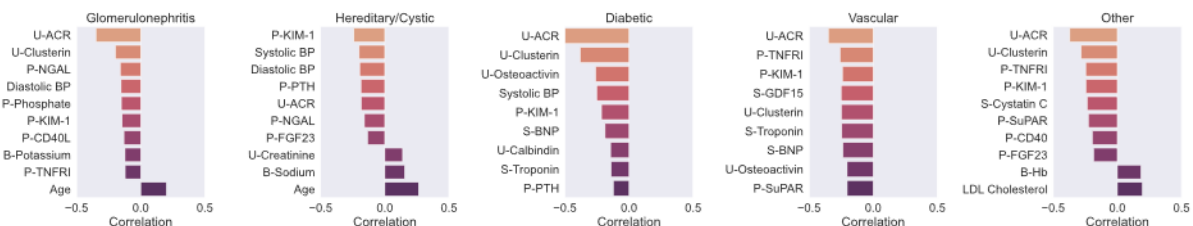
Figure 1: Top 10 eGFR slope correlations across disease groups.
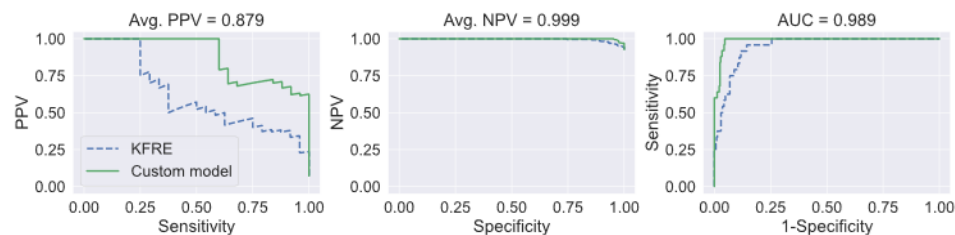
Figure 2: 1-year discrimination metrics for a Cox model fitted to the hereditary/cystic group, based on eGFR and P-KIM-1, compared to the Kidney Failure Risk Equation.

Discussion: These findings suggest that aetiology may play an essential part in producing reliable risk assessments for CKD patients, highlighting the necessity of its capture and further strengthens the idea that CKD as an umbrella term may be too broad of a concept in the context of determining future rate of progression.

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Poster number: 007

Submission number: 438

Estimated glomerular filtration rate using Cystatin-C, but not Creatinine, is associated with mortality following adjustment for body composition: UK Biobank sequences of regressions analyses

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[2]School of Medicine, Keele University.
[3]Institute of Cardiovascular Sciences, University of Birmingham.
[4]Royal Stoke University Hospitals, Stoke-on-Trent

Biography
Matthew Tabinor is a Speciality Registrar in Renal Medicine at the Queen Elizabeth Hospital in Birmingham. He is currently undertaking postgraduate research at Keele University (PhD student) into the associations between lean tissue mass and adverse outcomes in multiple long term conditions, including chronic kidney disease.

Abstract

Introduction: There is data suggesting estimated glomerular filtration rate using Cystatin-C (eGFR$_{Cystatin-C}$) is superior to the creatinine-based (eGFR$_{Creat}$) method when assessing associations between renal function and mortality (Lees *et. al* 2019). Given cystatin-C is derived from all nucleated cells and creatinine from skeletal muscle, there remains a need to understand how controlling for long term conditions (LTCs), ageing, inflammation and estimates of muscle mass will affect the association between mortality and different measures of renal function.

Methods: An observational study was conducted using the UK Biobank cohort. Adults were recruited between 2007-2010 at 22 UK centres. MM was estimated using bioimpedance defined whole body fat-free mass (BI-FFM: Tanita BC418). The primary outcome was all-cause mortality (ACM – data from NHS Information Centre [England / Wales] and NHS Central Registry [Scotland]). Follow up was defined as the period between the first visit date to either date of death / the latest date for central registry downloads (December 2021). Estimated GFR$_{Creat}$ or eGFR$_{Cystatin-C}$ were calculated using the CKD-EPI 2009 equation without ethnicity correction. Albuminuria was defined as a urine albumin / creatinine ratio of > 3mg/mmol. Participants were excluded if they were on dialysis, died from SARS-CoV-2 infection or withdrew consent. Sequences of regressions analyses (SoRA), a graphical Markov modelling technique which assesses complex direct and indirect pathways of association between blocks of variables which are ordered *a-priori* to reflect postulated directions of association, were constructed for both eGFR$_{Creat}$ and eGFR$_{Cystatin-C}$ – controlling for BI-FFM, weight and height as body composition variables.

Results: There were 500,589 participants eligible for analysis (272,623 females / 227,966 males). There were 10,299 and 21,319 participants with eGFR$_{Creat}$and eGFR$_{Cystatin-C}$ < 60ml/min/1.73m^2 respectively, and

25,308 were albuminuric. There were 33,755 deaths over a median follow up period of 12.58 (IQR 11.85-13.30) yrs. Higher eGFR$_{Creat}$ was associated with higher odds of ACM in men (OR 1.012, 95%CI 1.004-1.020) and women (OR 1.010, 95%CI 1.001-1.018) in the presence of an interaction with weight in both sexes. Higher eGFR$_{Cystatin-C}$ was associated with lower odds of ACM in men (OR 0.978, 95%CI 0.968-0.988) and women (Figure 1: OR 0.986, 95%CI 0.984-0.987). In men there was an interaction between eGFR$_{Cystatin-C}$ and weight observed. Interaction plots showed that weight had less influence on the association between ACM and renal function in the eGFR$_{Cystatin-C}$ compared to the eGFR$_{Creat}$ sub-models.

Conclusion: Higher eGFR$_{Creat}$ is associated with higher ACM when controlling for FFM and weight, whereas higher eGFR$_{Cystatin-C}$ is associated with lower ACM. This suggests eGFR$_{Cystatin-C}$ is more resilient to the effects of variable body composition when compared with eGFR$_{Creat}$, providing a potential explanation for the stronger association between eGFR$_{Cystatin-C}$ and mortality. In this model, eGFR$_{Creat}$ should be viewed as a FFM surrogate.
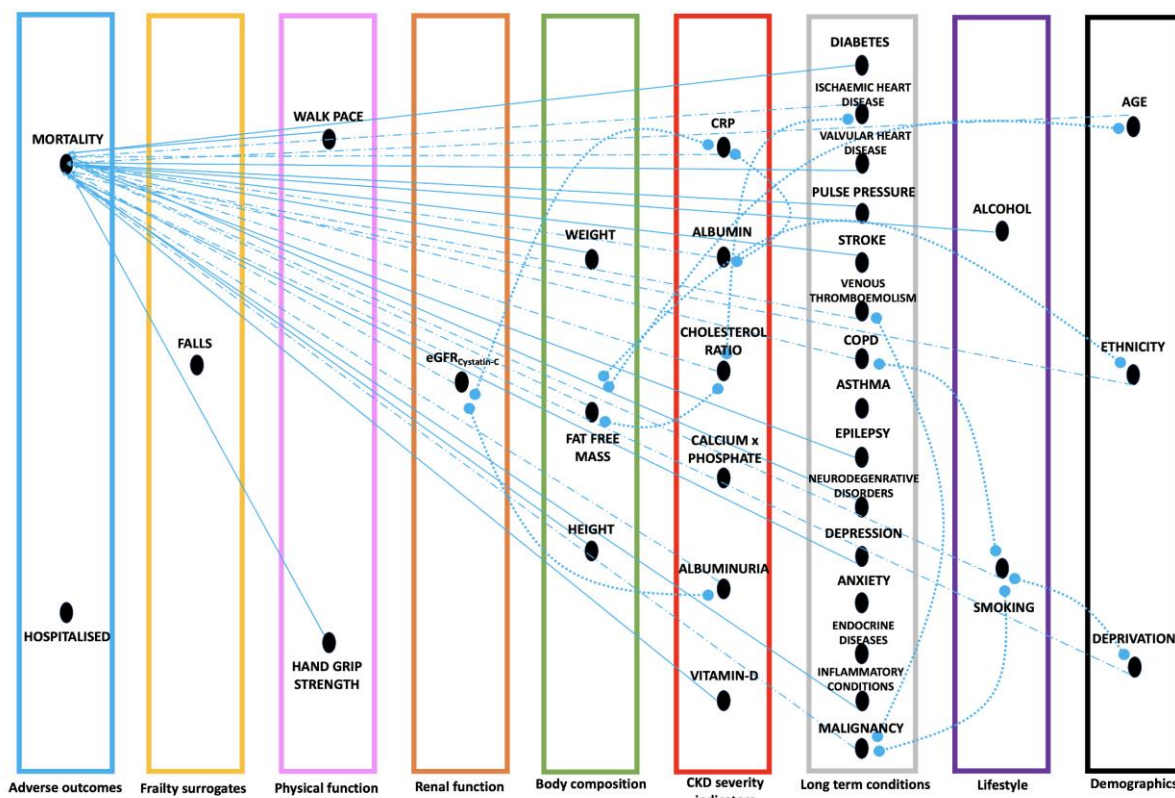
Figure 1: Factors directly associated with mortality using sequences of regressions analyses (SoRA) in females using the eGFR$_{Cystatin-C}$ submodel. Mortality in this model is seen as a response variable to variables to the right on the graph. Direct associations without interaction are depicted as straight lines (continuous line) with the arrow pointing towards mortality. Direct associations with interactions present are depicted as straight lines (dotted-hyphenated line) with the arrow pointing towards mortality. Interaction terms within the final model are depicted as curved lines (dotted), adjoining the two variables involved in the interaction term.

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Study Registration Number

This project was approved by the UK Biobank (Approved Research ID 70918).

Poster number: 008

Submission number: 475

Presenting treatment options to older patients with advanced kidney disease: Two approaches and their consequences

Dr Lucy Selman[1], Dr Chloe Shaw[1], Dr Ryann Sowden[1], Professor Fliss Murtagh[2], Professor Fergus Caskey[1], Professor James Tulsky[3,4], Professor Ruth Parry[5], Dr Rebecca Barnes[6]

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[4]Dana-Farber Cancer Institute, Boston, USA.
[5]Loughborough University, Loughborough, UK.
[6]University of Oxford, Oxford, UK

Biography
Dr Lucy Selman is Associate Professor in Palliative and End of Life Care at the University of Bristol, where she co-leads the research group. As part of an NIHR Career Development Fellowship (2019-2024) she is leading the OSCAR study (Optimising Staff-Patient Communication in Advanced Renal disease). Specific current research interests include treatment decision-making and communication; family care-giving and bereavement; widening access to services; and public health approaches to end-of-life care and bereavement. She has published over 100 peer-reviewed papers and regularly contributes to discussions about end-of-life care and bereavement in the media. In 2020 she founded Good Grief Festival, a public engagement initiative which has now reached over 30,000 people.

Abstract

Introduction: For older people with kidney failure, especially those with comorbidities or poor performance status, the survival benefits of dialysis are uncertain and quality of life impact greatest. There is significant variation in the uptake of the alternative treatment option - conservative kidney management (CKM). How clinicians communicate about treatment options strongly influences patients' decision-making, but this has been under-researched. The OSCAR study (Optimising Staff-Patient Communication in Advanced Renal disease) aimed to identify and describe how these treatment options are presented by clinicians to older people (age 65+) with advanced kidney disease (eGFR ≤20 mls/min/1.73m^2 within the last 6 months) and the implications of this for patient engagement with the decision.

Methods: Outpatient consultations between doctors/nurses and eligible patients were video-recorded at 4 UK renal units with varying rates of CKM. Consultations where clinicians presented both dialysis and CKM were transcribed and analysed using the method of Conversation Analysis. Post-consultation, patients completed the Shared Decision-Making Questionnaire (SDM-Q-9). Comparisons were made between groups according to how treatment options were presented, using a non-parametric Median Test.

Results: A total of 110 outpatient consultations were recorded (104 audiovisual, 6 audio), including 38 clinicians and 94 patients; mean patient age 77 (65-97); 33 female/61 male; mean eGFR 15 (range 4-23). Sequences where clinicians presented both dialysis and CKM as treatment options were analysed (n=21). Two approaches to presenting CKM were identified: 1) CKM as a main option (n=6; Fig 1), 2) CKM as a subordinate option (n=15; Fig 2). The mean consultation length was the same in both groups (23 minutes). Recurrent features of the first approach included: framing CKM as having potential personal benefits to the patient; explicitly labelling it as a treatment option; not framing it as an option preferable/relevant to a minority of patients. In contrast, when CKM was presented as a subordinate option, recurrent features included: framing CKM as not having benefit to the patient; not explicitly labelling CKM as a treatment option; appending CKM to the main decision-making sequence; framing CKM as an option preferable/relevant to a minority of patients. Presenting CKM as a main option alongside dialysis was a less common approach but associated with more interactional opportunities for patients to ask questions about CKM, assert their perspective, and assess CKM as a relevant option, as well as significantly higher post-consultation patient ratings of shared decision-making (total SDM-Q-9 score, p=0.041).

Discussion: This is the first fine-grained analysis of the relationship between the conversational practices used by clinicians and their impact on patient engagement with treatment options and ratings of shared decision-making. Despite evidence that dialysis does not reliably extend older patients' lives at acceptable costs to quality of life, we found that clinicians tend to present dialysis as the default treatment and CKM as a subordinate option, if at all. Our findings demonstrate that presenting treatment options is not enough; *how* clinicians present options has important implications for patient engagement in shared decision-making. Study findings will form the a new communication training intervention for clinicians.

Figure 1: Example of presenting CKM as a main option

```
1    NUR:    .hh So the other option of treatment, is what we call
2            our <conservative care.>=[Okay, so that is a] type of
3    PAT:                              [hmm    hm    hm    ]
4    NUR:    treatment, (0.5)/.hh has a real focus on qtuality of
5            li:fe, (0.3) your wellbeing, .hh okay so it's .hh
6            continues as we are now really is protecting the
7            kidney function that you ha:ve,=
8    PAT:    =hmm,=
9    NUR:    =An that's through your< (.) medication isn't it, an'
10           your< (0.2) di:e:t, .hh that continues, .hh but as
11           the kidney function, (0.3) would get wo:rs:e, (0.2) we
12           wouldn't be looking at st:arting any dialysis, (0.2)
13           it would be more managing the symptom:s [    o]kay,
14   PAT:                                            [hmm:,]
15   NUR:    An again that's really throu:gh, (0.3) uh:m: tcha
16           medication, (0.2) an diets, (0.4) .hh an you know
17           keeping yourself as well as possible.
```

NUR= nurse; PAT=patient

Figure 2: Example of presenting CKM as a subordinate option

```
1    NUR:   =Well not everybody will choose to have dialysis.=

2    PAT:   =No:.=

3    NUR:   =.hh So some people will sa:y, (0.6) 'that's one step too

4           far for me I don't want it.'

5    PAT:   Yeah.=

6    NUR:   =.hh But your kidney function will carry on going

7           do:wn.

8    PAT:   Yeah.

9    NUR:   .hh Ultimately, hh. .hh you wouldn't survi:ve.

10   PAT:   No.

11          (.)

12   NUR:   .hh We can m:anage the symptoms, of the kidney disease,

13          .hhh an get the best out of your kidneys, hh. but

14          ultimately, .hh you wouldn't survive if you didn't have

15          the treatment.
```

NUR= nurse; PAT=patient

Poster number: 009

Submission number: 538

Initiation of Finerenone: a Primary or Secondary Care Process?

Dr Andrew Frankel[1], Dr Kieran McCafferty[2], Dr Jason Diep[1], Dr Anna Wozniak[2], Dr Joseph Gaied[1], Lina Johansson[1], Maryam Khorsandi[1], Dr Arun Ramaswami[2]

[1]Imperial College NHS Trust, London.
[2]Barts Health NHS Trust, London

Biography
Dr Kieran McCafferty is a Nephrologist at Royal London Hospital

Abstract

Intro: Chronic Kidney Disease (CKD) alongside Type 2 Diabetes Mellitus (DM2) mandates a tailored therapies. Recent approval by the National Institute for Health and Care Excellence (NICE) (1) has designated Finerenone as an add-on therapy for patients with CKD and DM2 on standard care (ACEI/ARB plus SGLT2 inhibitors) (2).

We investigated the most effective strategy for initiating and optimising Finerenone therapy comparing two distinct pathways within two prominent renal centres.

Methods: We undertook a multicenter QIP comparing two pathways for commencing Finerenone. In the first pathway, patients in Northwest London (NWL) commenced Finerenone face-to-face in general nephrology clinics, where they received dietitian advice on avoiding hyperkalaemia, with follow-up visits to monitor kidney function, potassium, and blood pressure. In the second pathway in Northeast London (NEL), GPs were requested to initiate and optimise Finerenone by nephrologists for eligible patients.

Both pathways used a standard operating procedure including common patient information, communications with primary care, and low potassium diet sheets.

Outcomes were assessed based on the number of patients who successfully initiated finerenone, effective monitoring of biochemical markers during follow-up, and the maintenance of treatment over the long term.

Results: Analysis after the first four months revealed a similar number of potentially eligible patients (29 NWL, 27 NEL) identified through GP referrals. 21 patients in NWL and 15 patients in NEL were commenced on finerenone. Baseline patient characteristics for NWL/NEL respectively were eGFR 39.4/43.6 mL/min/m^1.73, uACR 186.8/169.6 mg/mmol, K+ 4.6/4.5 mmol/L, Hba1c 57/62 mmol/mol, sBP 140/134 mmHg, dBP 78/75 mmHg. Serum potassium was measured 3-5 weeks after starting finerenone for 13 patients in NWL and 6 patients in NEL. 2 patients in NWL had potassium above 5.5 mmol/L, both were managed without need for hospitalisation. 1 patient in NEL had a potassium of 6.2 mmol/L, and required brief hospitalisation. Longer term follow-up is continuing to examine maintenance

of therapy. Ongoing follow-up will allow further data to assess and compare whether initiation of finerenone therapy was successful in either group.

Conclusions:. Many patients who require finerenone are currently being managed in primary care, but require extensive engagement and education to ensure it is initiated successfully and safely. Managing all these patients in secondary care would be expensive, and lead to significant delays. Novel approaches will need to be considered.

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2. NICE guideline (NG28), published Dec 2015, updated June 2022, guidance 1.8.17.

Predicting kidney failure from trends in serum creatinine: a feasibility study.

<u>Mr. Dave Yeung</u>[1], <u>Dr. Peter Gallacher</u>[1], Dr. Gavin Chapman[1], Dr. Eve Miller-Hodges[1,2], Professor Bean (Neeraj) Dhaun[1,2], Dr. Robert Hunter[1,2]

[1]Edinburgh Kidney Research Group, Edinburgh.
[2]Department of Renal Medicine, Royal Infirmary of Edinburgh, Edinburgh

Biography
Mr. Dave Yeung. Health data scientist.

Dr Peter Gallacher. In May 2023, I completed a PhD in cardio-renal epidemiology at the University of Edinburgh/BHF Centre for Cardiovascular Science. This work utilised routinely collected regional, national and clinical trial healthcare data and was funded through the award of a Clinical Research Training Fellowship from the British Heart Foundation. Previously, I completed a period of training in statistical modelling and epidemiological principles during a Master of Public Health degree at the University of Edinburgh.

Abstract

<u>Introduction.</u>   Chronic kidney disease (CKD) affects ~3.5 million individuals in the UK, but only a small proportion develop kidney failure. Early identification of at-risk individuals is essential for timely disease-modifying intervention and preparation for kidney replacement therapy. NICE recommends GPs use the Kidney Failure Risk Equation, a predictive tool that evaluates age, sex, serum creatinine and urinary albumin:creatinine ratio. This is problematic because it uses data from a single timepoint – discarding potentially informative serial data – and neglects the ~80% of CKD patients for whom urinary albumin data are missing [1]. Our ultimate aim is to develop a risk prediction tool based on serial serum creatinine results. As the first step, we determined the feasibility of such an approach by testing whether trends in serum creatinine are associated with kidney failure risk in the general population.

<u>Methods.</u>   We analysed serum creatinine data from 512,905 individuals in a Scottish Regional Health board (2006-2020), linked to national mortality data and kidney failure events in the Scottish Renal Registry. We built a joint model incorporating longitudinal and survival data (linear mixed effect and Cox models). This approach – unlike classical methods for analysing time-to-event data – incorporates serial measures collected at irregular intervals [2]. Within those individuals who had at least three blood tests over a period of more than 12 months, we computed median eGFR over a rolling 12-month window and included individuals in the joint model if eGFR was <30 ml/min at any time. Serum creatinine data from three years prior to eGFR <30 ml/min and all subsequent timepoints were included in the model.

<u>Results.</u>   413,512 individuals (~57% of the general adult population) had at least three blood tests spanning >12 months. There were 14,602 individuals (78±11 years, 57% women) with eGFR <30. During median follow-up of 2.3 years [IQR 0.68–4.93], the median number of blood results per individual was 22 [10–41]. There were 2929 ESKD events, 3443 cardiovascular deaths and 4951 non-cardiovascular deaths; 3279 individuals were censored before meeting any of these endpoints. After adjustment for

known risk factors, age, eGFR value at any point in time during follow-up and eGFR slope were significant predictors of ESKD in the joint model (Figure). Specifically, the risk of kidney failure increased by one-fifth for every 2.5 ml/min decline in eGFR *per* year (adjusted Hazard Ratio [aHR] 1.19, 95% CI 1.13–1.27, *p*<0.001), whilst for every 2.5 ml/min reduction in eGFR value at any point in time during follow-up the risk of kidney failure doubled (aHR 2.02, 95% CI 1.83–2.15, *p*<0.001).
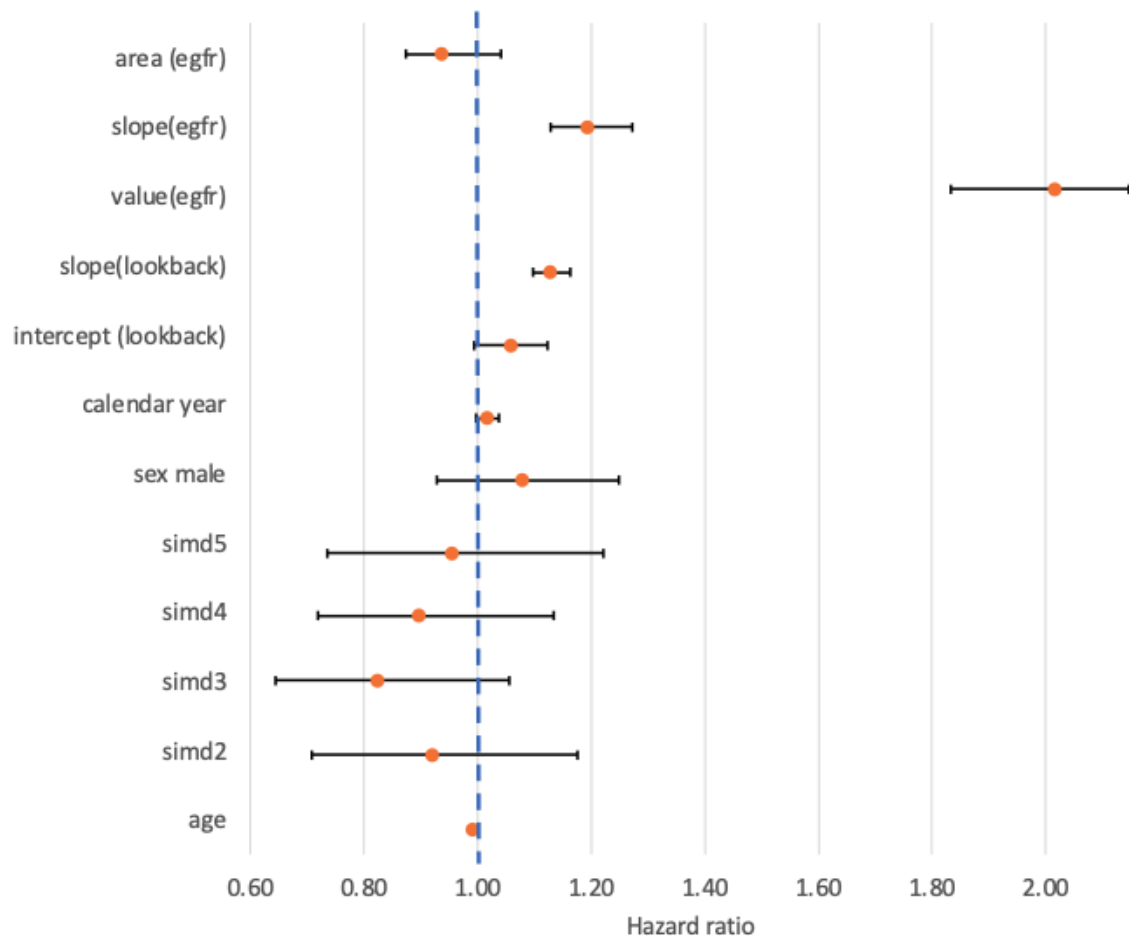
Forrest plot showing output from joint model. Hazard ratio shows relative risk of developing kidney failure per 2.5 ml loss in eGFR (value) or a loss of 2.5 ml per year (slope) or per year (age). SIMD2 – 5 represent quintiles of decreasing socioeconomic deprivation, compared to the most deprived reference category of SIMD1.

Discussion. We have shown that a large proportion of the general adult population have sufficient routinely collected blood test data to support a joint modelling approach to predicting kidney failure and that trends in serum creatinine associate with kidney failure risk. We plan to validate this in other populations and build a clinical alert tool to be embedded into lab reporting systems to alert GPs and other health practitioners to individuals at risk of kidney failure.

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[2] Arisido WM et al. (2019). Joint model robustness compared with the time-varying covariate Cox model to evaluate the association between a longitudinal marker and a time-to-event endpoint. BMC Med Res Methodology 19, 222.

Poster number: 011

Submission number: 597

Feasibility of population-wide automated 'Kidney Failure Risk Equation' (KFRE) reporting for patients in primary care using 'WinPath' Laboratory Information Management System (LIMS)

Dr. Javeria Peracha, Mr. Steve Harris, Dr Clare Ford, Dr. Shashidhar Cherukuri

The Royal Wolverhampton NHS Trust, Wolverhampton

Biography
Dr. Javeria Peracha. Renal Spr and Research Fellow

Abstract

Introduction: The updated 2021 NICE chronic kidney disease (CKD) guidelines[1] recommends routine risk stratification of patients using the 4 variable kidney failure risk equation (KFRE). Patients with a 5 year risk of kidney failure greater than 5% should be considered for specialist referral. Despite these recommendations, clinician awareness and uptake of KFRE in primary care settings remains poor. It has been suggested that automated KFRE reporting for eligible patients by laboratory information management systems (LIMS) may accelerate this but real world data on feasibility and potential workload implications remains scarce.

Methods: At a single UK renal centre, nephrologists and biochemists collaborated to develop a bespoke KFRE calculator within the local LIMS (WinPath software from CliniSys). 5 year kidney failure risk was to be automatically calculated and reported whenever a urine ACR result greater than 3 mmol/mol was reported for an adult whose most recent eGFR, within the last 6 months, was less than 60 mL/min (excluding any eGFR results associated with an AKI alert). This rule was initially limited to samples from primary care settings and run in a "test" system (reports only visible to developing clinicians and biochemists). Data was extracted and analysed from the test system for 6 local primary care networks (PCNs) across a one month period between 01/08/23 - 31/08/23.

Results: The 6 PCNs included in the "test system" had a total registered population of 295,584 patients. During the one month test period, a total of 253 KFRE reports were generated for the population, of these 117 (54%) had a 5 year KFRE risk > 5%. The number of reports generated at PCN level ranged between 23 - 61 (Table 1) and at individual GP practices ranged between 1 - 22 (figure 1).

Discussion: We have successfully developed and tested an automated KFRE calculator within our LIMS. Modelling from the test system suggests that population-wide implementation across primary care locally will only result in a small additional workload at individual practice or PCN level and these numbers can inform ongoing discussions with primary care colleagues about the implications of population-wide roll out. Of note, local CVD Prevent[2] data suggests that presently only 29% of eligible patients on primary care CKD registers have a urine ACR tested in the last 12 months and as measures to improve this gain momentum the number of KFRE reports may also increase considerably. Further work

is also being undertaken to better understand the impact on referral rates and workload for renal units and how services can be optimally configured to accommodate this.

	Table 1: Automated KFRE reports generated in LIMS test system (01/08/23 - 31/08/23)			
	Registered Patients	Number of reports	KFRE <5%	>5%
PCN 1	30,658	23	11	12
PCN 2	38,144	45	21	24
PCN 3	49,637	38	17	21
PCN 4	54,119	39	18	21
PCN 5	56,293	47	21	26
PCN 6	66,733	61	29	32
Total	295,584	253	117	136

Figure 1: Number of automated KFRE reports generated via bespoke 'WinPath' Laboratory Information Management System (LIMS) pathway, for community patients across 6 primary care networks (PCNs) in England
01/08/23 - 31/08/23

References

1- https://www.nice.org.uk/guidance/ng203

2 - https://www.cvdprevent.nhs.uk/data-explorer
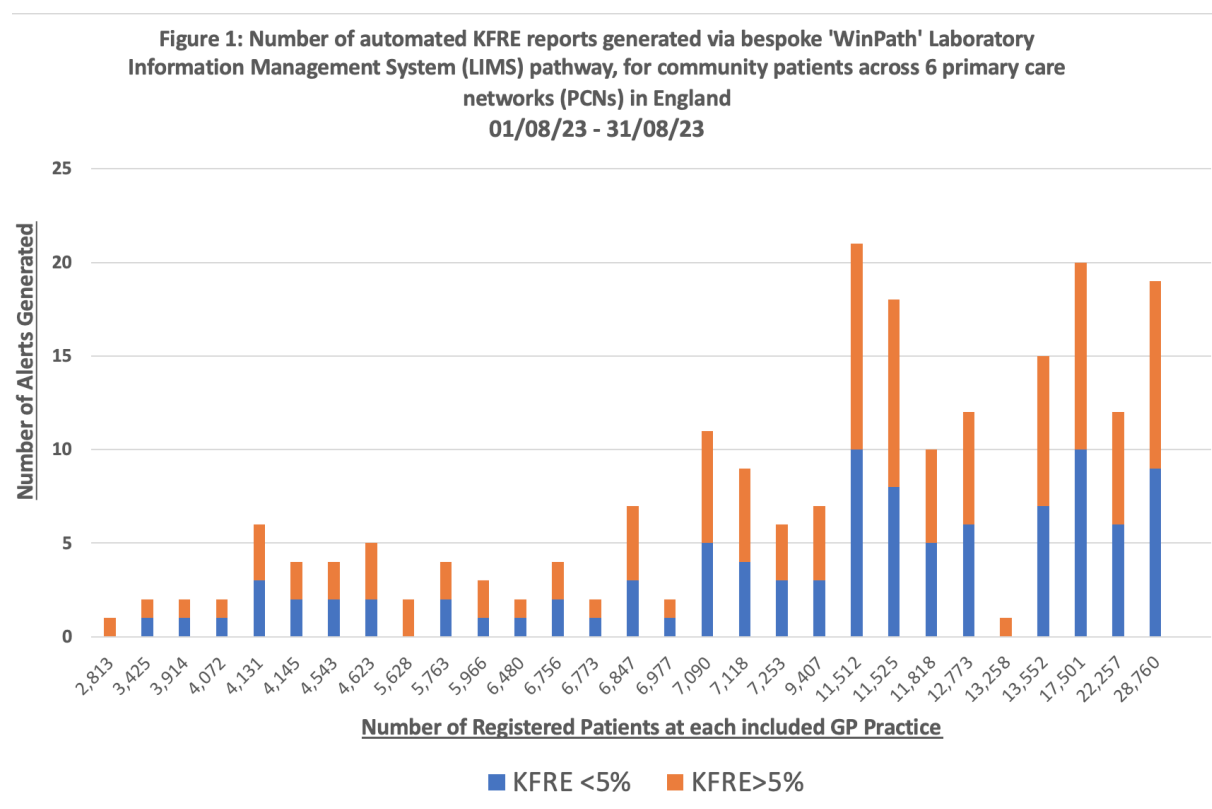
Poster number 012 - WITHDRAWN

Poster number: 013

Submission number: 561

A Quality Improvement Project to Implement an Enhanced Supportive Care Framework in the Dialysis Population.

Natalie Erickson, Dr Olivia Worthington, Dr Hannah Sammut

Liverpool University Hospitals Foundation Trust, Liverpool

Biography
Natalie Erickson. Renal Nurse Practioner currently working in the Renal Acute Care Team and the KQUIP lead nurse for the Nephrology department.

Abstract

Introduction: Enhanced supportive care is a key priority in the Renal Services Transformation Plan (RSTP) and is a recognised unmet need in the dialysis population. Locally there is no framework to support this. Local data suggested a high prevalence of frailty and comorbidity. We recognised that the development of an enhanced supportive care framework had the potential to significantly improve patient's quality of life. We applied the KQUIP methodology to develop this for our patients on haemodialysis in a centre in the North West of England. We report on a pilot to implement the iPOS questionnaire as the 'Plan, Do, Study, Act' (PDSA) methodology.

Methods:

Planning: We created an MDT to support this work, and a patient representative is also involved.

IPOS renal was identified as a validated, reproducible holistic assessment for this group of patients. Using the IPOS with the support of the MDT we hoped would drive change and lead towards the creation of an enhanced supportive care framework. We created a driver diagram (figure 1) and process map to guide the steps in using the iPOS renal (figure 2).

Figure 1 Driver Diagram
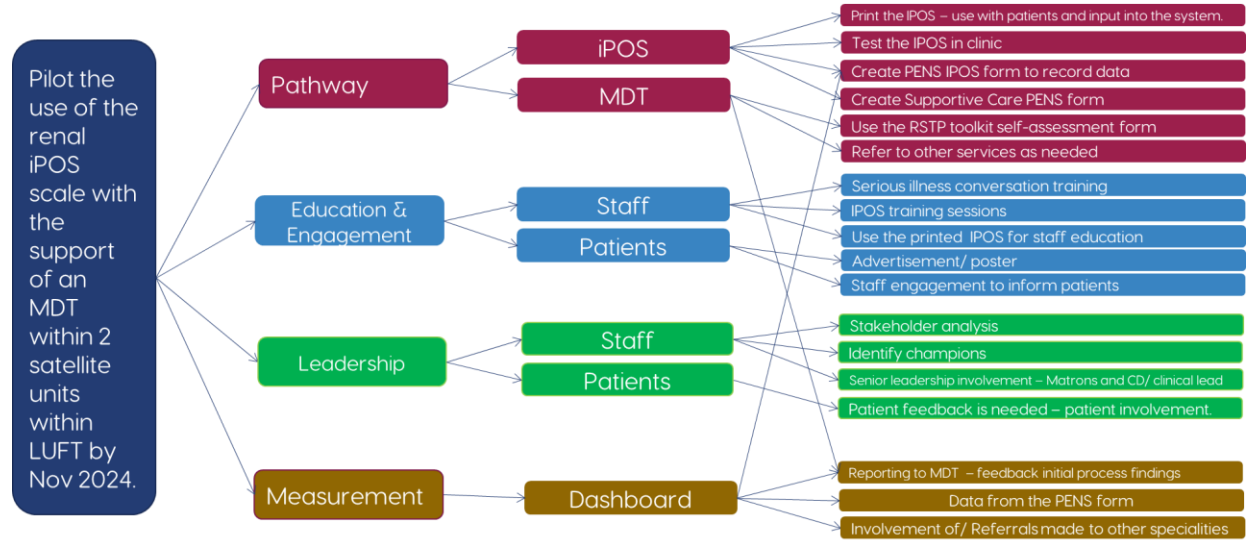
Figure 2: Process Map to Guide Implementation of the iPOS.
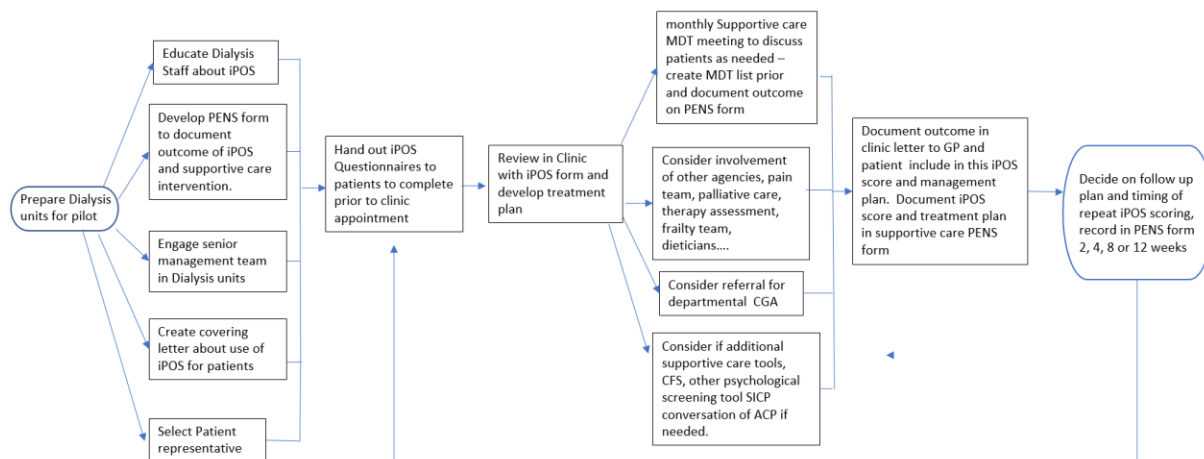
Doing: We piloted the IPOS questionnaire in two haemodialysis units as part of the routine clinic review. The MDT is supported with advice for the management of symptoms or concerns.

Results Study: IPOS questionnaires have been completed in 20 patients. The total IPOS Score ranged from 1 to 39, with a median score of 21 and a mean score of 19.9.

3 patients have had their scores repeated so far and each showed improvement with a reduction in overall scores from 27 to 23, 21 to 16 and 21 to 1. The graphs summarise symptoms recorded;

Graph 1 – Summary of physical symptoms for each patient according to IPOS score

Summary of symptoms
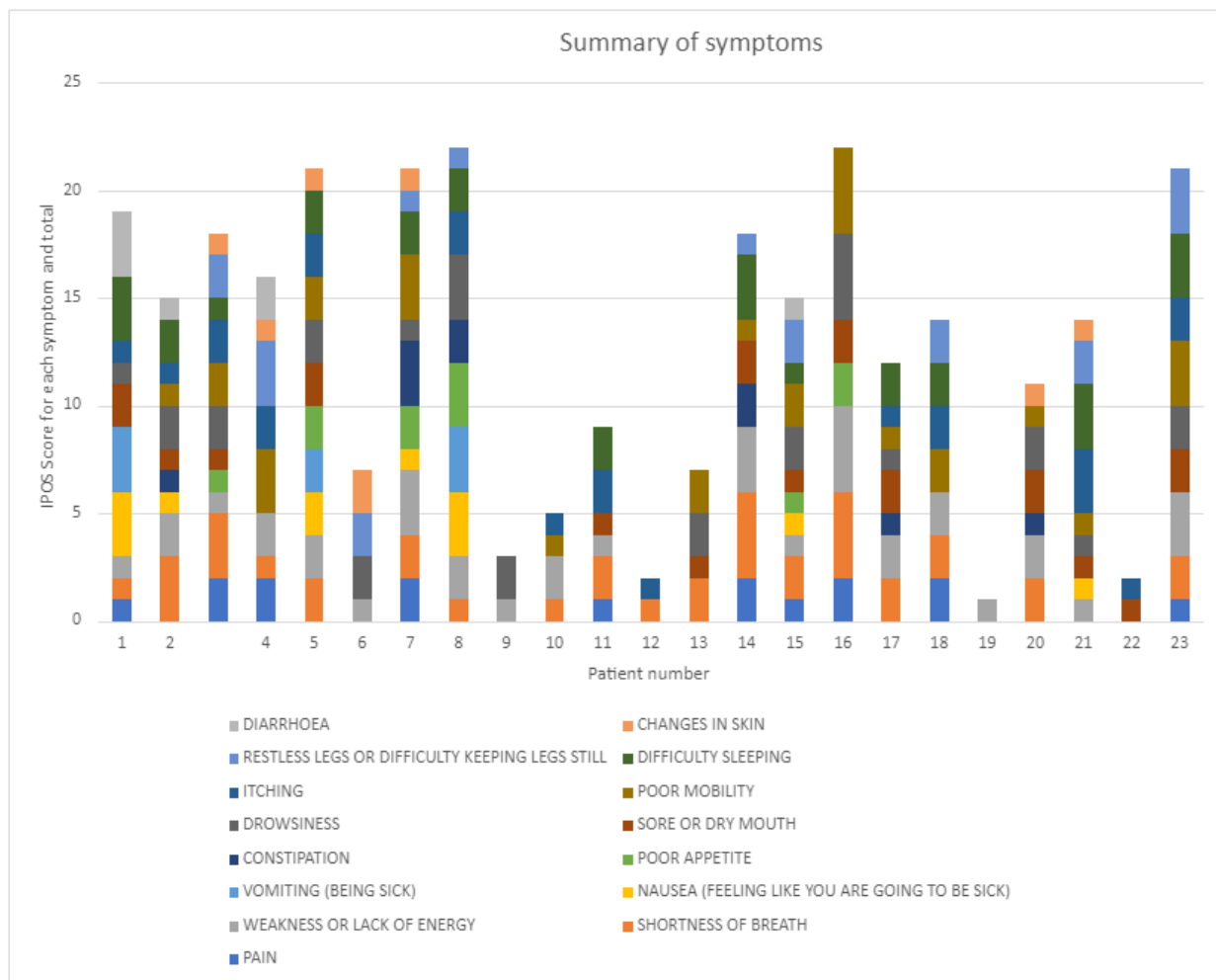
Graph 2 Number of patients scoring >3 in psychological symptoms
scoring
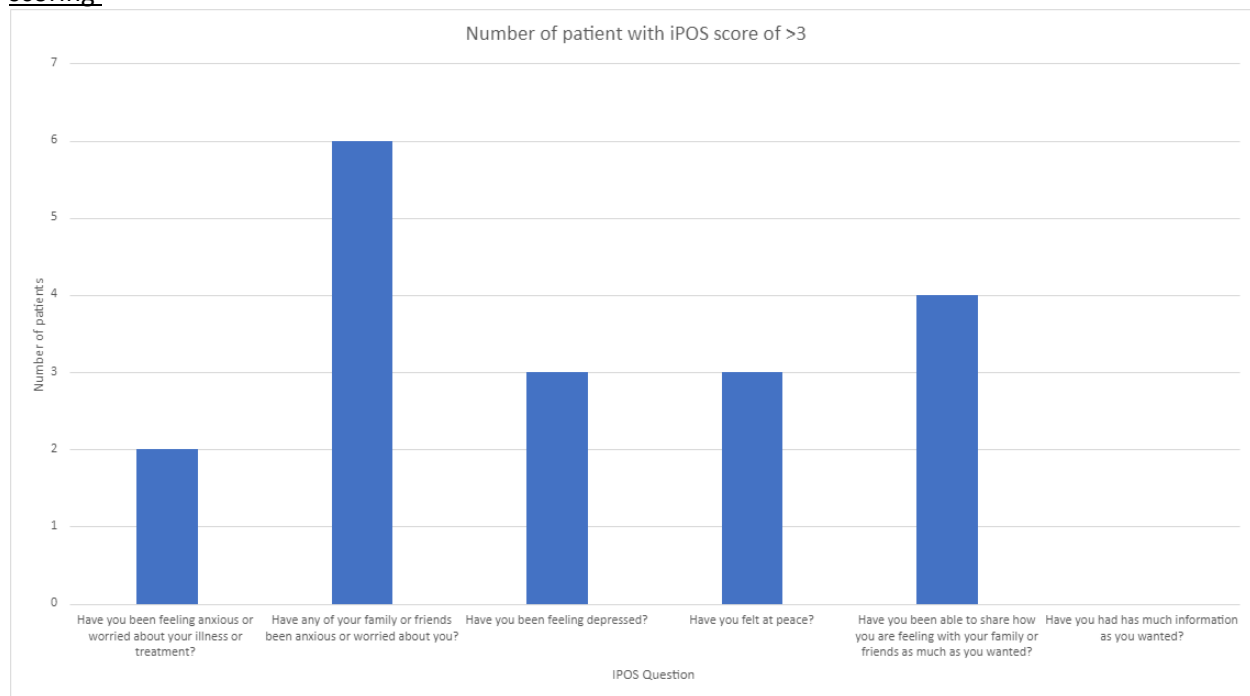
6 patients reported financial or practical problems were only partly addressed or hardly addressed

Focused reflection following discussion in the MDT highlighted.

1. Used of the IPOS identified previously unrecognised social needs that had an impact on patient health and dialysis adequacy.
2. The use of the IPOS allowed people to open up about mental health needs.
3. An MDT approach to review complex symptoms was very useful.
4. For some patients having the questionnaire prior to clinic review would have been preferable.

Discussion

Act: We have demonstrated that the iPOS questionnaire can be used within a clinic consultation. The use of the questionnaire identified previous unmet needs. We have been able to use an MDT approach to support patients. With the application of Quality improvement methods, we continue to learn and modify this process. In doing so we hope to create a sustainable, resilient and equitable approach that will support our patients to live as fully as possible with end-stage kidney failure.

Poster number: 014

Submission number: 187

Embedding foot screening into the dialysis setting - a quality improvement project

Ms Kirsty Yates, Mrs Myleen Almanza, Ms Jodie Buckingham

Oxford University Hospitals NHS Foundation Trust, Oxford

Biography

Kirsty Yates has worked as a Specialist Podiatrist within the acute podiatry service of Oxford University Hospitals NHS Foundation Trust since 2014. During this time Kirsty has predominantly worked within the inpatient setting, initially being an instrumental part of the team establishing the ward based podiatry service. She has contributed to the wider programme of work aimed at improving the quality of diabetes related care locally. Kirsty has been involved in ongoing audit, quality improvement and staff education workstreams. She has led on projects in the development of a pathway for managing foot complications in the ambulatory setting and foot risk screening and staff education in renal disease. Kirsty has a wealth of clinical experience in wound care and diabetes, which has been enhanced by successfully completing an MSc in Diabetes from University of Warwick in 2011 followed by an MSc in Wound Healing and Tissue Repair from University of Cardiff in 2018. This has led to the wider opportunities of annual teaching on The Diabetic Foot Module course and ongoing work as an honourary tutor with University of Cardiff as part of their Masters programme within the School of Medicine.

Abstract

Introduction: End stage renal disease and dialysis treatment are independent risk factors for foot ulceration and lower limb amputation, both as standalone conditions[1,2] and when presenting in co-existence with diabetes[3,4]. Foot screening is essential for identifying risk factors (POAD, neuropathy, existing foot disease) and so those who will benefit from preventative foot care or management of active foot disease, and has been shown to reduce major amputations[5]. Those attending for dialysis often struggle to access services outside of this setting[6] and so dialysis sessions present an opportunity for regular foot surveillance. The aim of this quality improvement (QI) project was to embed foot screening into haemodialysis sessions across all Oxford Kidney Unit (OKU) centres, with a package of education and referral pathways to enable the prevention and management of foot problems.

Method: Face to face surveys and foot checks of 373 patients receiving haemodialysis and anonymous survey of 44 dialysis staff were completed. This provided baseline data on access to foot checks, foot care needs and staff knowledge/skill level in foot screening. To implement the intervention, all staff completed a bespoke Renal Foot Health e-learning package, supported by practical training sessions. A foot screening tool was designed along with a patient information leaflet, and referral pathways to local Podiatry services were developed. Following implementation initial metrics were re-audited.

Results: The foot screening programme has been rolled out in all 7 OKU centres. Initial scoping revealed only 52% of patients to have received a foot check, with improvement to 68% seen after implementing the programme in 2 centres.   Of these, 87% received foot health education and 45% were offered heel

pressure offloading. A further 9% were referred to local Podiatry services. More modest improvements were seen in interim results from the other centres.

Starting staff survey responses demonstrated 23% had received formal training around renal foot health, 45% felt confident screening feet and 61% knew where/how to refer an individual with foot complications. Post intervention results improved to 88% having received training, 92% feeling confident to do so and 94% knowing the referral pathway.

Discussion: The provision of foot screening integrated into dialysis sessions is fundamental to screening uptake and so identifying risk factors and foot problems as per national guidelines[7,8]. When delivered by appropriately trained staff within a framework of supporting patient education and onward referral, it should ultimately reduce foot complications and amputations. Our QI project results demonstrate we have successfully introduced foot screening to our patient group. For this intervention to be truly embedded it is essential that 3 monthly foot screening is sustained, with all dialysis staff completing the e-learning package every 3 years.

Key challenges we faced during the project were accurate data collection through available IT systems and maintaining momentum during the COVID-19 pandemic when pressure on both the Podiatry and Dialysis services were high. Going forward we will continue to embed foot screening into all dialysis centres, where uptake has been lower we will establish the barriers to this and ways to overcome them.

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8. Joint British Diabetes Societies for Inpatient care (JBDS-IP) 2023. *Management of adults with diabetes on dialysis*. Available at: [JBDS 11 Management of adults with diabetes on dialysis | The Association of British Clinical Diabetologists (abcd.care)](#)

Poster number: 015

Submission number: 189

Analysing the impact of the Covid-19 Pandemic on Hepatitis B vaccination compliance on In-Centre Haemodialysis Patients: Vaccination Fatigue Theory.

<u>Miss Lucy Porter</u>, Mr Marcus Chastauneuf

University Hospitals Birmingham, Birmingham

Biography
Miss Lucy Porter. I am a Satellite Dialysis Nurse with 5 years experience. I am the Blood Bourne Virus/Hepatitis Vaccination link nurse and I am responsible for overseeing timely vaccination of patients. I became interested in exploring patients reasons for non-compliance since the covid-19 pandemic.

Abstract

Introduction: Haemodialysis patients are a vulnerable group of people at increased risk of acquiring Hepatitis B Virus (HBV) compared to the general population, due to regular exposure to blood, skin breaches and sharing of dialysis equipment (Hettenbaugh, et al, 2021).

With no current cure or treatment options available for HBV, determining a patients immunity status and offering vaccination is prioritised for patients on haemodialysis.

Vaccination Fatigue is defined as "People's inertia or inaction towards vaccine information or instruction due to perceived burden or burnout" (Cheshmehzangi, 2022). Vaccination Fatigue is a recent concept – likely accelerated by the Covid-19 pandemic and the subsequent vaccination programmes.

Methods: Comparing historical and current Hepatitis B, Covid-19 and Flu vaccination data and compliance from the pre-covid, during covid and post-covid periods (2019-2023), from our single centre dialysis unit.

Exploring the reasons for non-compliance with vaccination and establishing if any correlation can be identified with the covid-19 vaccination programme and the vaccination fatigue theory.

Results: Results from historical Blood Bourne Virus (BBV) reports (2019 – pre-covid), show that Hepatitis vaccination non-compliance was low at 4% (2 patients), although reasons for non-compliance were not recorded at this time.

Vaccination data from 2020 is unavailable, likely due to the onset of the pandemic taking precedent. However, the subsequent reports from this period (2021-2022), which coincides with the rollout of the covid-19 vaccination programme, have mixed results. The 2021 report shows no changes – 4% (2 patients), refusing vaccination. However, the following report (2022), shows a slight improvement in compliance rates and the number of patients refusing vaccination reduced to only 2% (1 patient).

The most recent post covid-19 BBV report (2023) shows a significant increase to 14% (8 patients) refusing vaccination. More than half of this patient group had previously received Hepatitis vaccinations prior to, or during the pandemic. Hepatitis vaccination refusal in most cases appears to have commenced after the covid-19 vaccine rollout, despite half of these patients receiving two or more covid vaccines in 2021/22. In addition, it is worth noting that all but one of these patients refused the 2023 annual flu vaccination, despite receiving it on previous years.

Further examination shows all but one patient had the same or similar reasons documented for non-compliance, which supports the vaccination fatigue theory – particularly the inaction of vaccination instruction element. Patients seemingly did not trust or want to receive any further vaccinations, regardless of their therapeutic indication.

Discussion: Evidently, there is an increase in vaccination non-compliance since the pandemic and vaccination rollout. However, variations in results will occur due to the total number of patients we treat in-centre. We are currently treating a higher number of patients in 2023 than we did in 2019. This will likely be reflected in the data.

It must also be noted that reliable comparisons cannot be made regarding patients' reasons for non-compliance as these were not documented prior to the pandemic.

Vaccination Fatigue can be detrimental to personal and public health and will continue to be a major obstacle in maintaining immunity for at risk patients (Stamm, et al, 2023)

Patient education is vital in understanding the pre-cursors to vaccination fatigue. Nurses are able to address misunderstandings surrounding vaccination efficacy, dispel vaccination myths, and explore vaccination options and alternatives, to encourage patients to make an informed decision.

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Poster number: 016

Submission number: 257

Compliance with antifungal prophylaxis in peritoneal dialysis associated peritonitis – results from a single UK centre with a quality improvement Initiative approach.

Dr Jyoti Baharani[1], Dr Danladi Nmadu[1,2]

[1]International society of peritoneal dialysis (ISPD)), Brussels – Belgium.
[2]University Hospitals Birmingham (Heartland), Birmingham

Biography
Dr Jyoti Baharani. Consultant Nephrologist

Abstract

INTRODUCTION: Peritonitis remains a significant risk in peritoneal dialysis (PD) patients, necessitating timely intervention to prevent systemic infections and preserve peritoneal membrane integrity. Fungal peritonitis, although rare, presents a particular challenge, due to its resistance to standard antimicrobial therapies. The International Society for Peritoneal Dialysis (ISPD) guidelines therefore recommends antifungal prophylaxis during peritonitis treatment to mitigate the risk of fungal peritonitis (ISPD Guidelines 2022). We wished to investigate compliance with antifungal prophylaxis during treatment of peritonitis at our centre as well as look at reasons for non-compliance.

METHODS : Retrospective analysis of all peritonitis episodes between January 2022 and December 2023. Demographic information and prescription details was obtained from the electronic medical records (PICS) and other patient unit records. The number of patients who did not have co-prescription of antifungals was determined.

RESULTS : A total of 141 episodes of peritonitis were recorded. Repeat peritonitis occurred in 35 episodes (25%), recurrent peritonitis in 7 episodes (5%), and relapsing peritonitis in 6 episodes (4%). One case of PD catheter insertion-related peritonitis was noted. The most common causative agents were Gram-positive organisms (52%, 73 episodes), followed by Gram-negative organisms (21%, 30 episodes), fungi (1.4%, 2 episodes), and acid-fast bacilli (0.7%, 1 episode). Polymicrobial growths were observed in 17 episodes (12%), and 11 episodes (7.8%) had negative cultures. Half of the fungal peritonitis cases were secondary infections following bacterial peritonitis. There were 23 patient dropouts, with 18 (78%) switching to haemodialysis (HD), 3 (14%) undergoing renal transplantation, and 2 (8%) associated with peritonitis-related deaths. Both patients who developed fungal peritonitis transitioned to HD. The average time to the first peritonitis episode was 23 months, with only one patient receiving prophylactic antifungal treatment during the study period.

DISCUSSION: Previous research highlights the risk of secondary fungal peritonitis following antibiotic therapy. Prophylactic antifungal co-prescription with antibiotics, as recommended by ISPD guidelines, is effective in preventing secondary fungal peritonitis. Despite a low incidence of fungal peritonitis in our centre, adherence to routine antifungal prophylaxis co-prescription is suboptimal. The clinical records

did not clarify why antifungals were not prescribed. An educational campaign is planned to increase awareness and improve adherence to antifungal prophylaxis guidelines. We also plan to change documentation to include reasons why antifungals are not prescribed if that is the case.

Poster number: 017

Submission number: 376

An implementation project aimed at promoting shared haemodialysis care to patients within the kidney unit.

Mrs Marianne Reyes

Oxford University Hospitals NHS Foundation Trust, Oxford

Mrs Marianne Reyes

Biography
Marianne has had an extensive career in renal nursing. Her current role is as a Ward Sister, this includes demonstrating leadership and clinical expertise as well as providing service development and Trust protocols. After working as a Ward Sister for 6 years, Marianne applied for the Greenshoots funding to be able to explore shared care in haemodialysis. The funding has helped to focus on its implementation hence improving patient outcome not only in her own unit but across all the dialysis units in her Trust. She is committed to continue the service and sustain shared care with the help of her team.

Abstract

Introduction: The Oxford Kidney Unit embarked on a quality improvement project to increase the number of in-centre hemodialysis patients performing Shared Haemodialysis Care (SHC). Prior to project initiation, SHC awareness and engagement was minimal amongst staff and patients with few in-centre haemodialysis (HD) patients performing any aspect of SHC. The aim of this project was to increase the percentage of all prevalent patients receiving maintenance in-centre HD treatment across all the OKU's dialysis facilities, and engaging with some degree of SHC, to over 20% within 12 months.

Methods: Following an initial PDSA cycle it was evident the need of more education and engagement amongst the clinical staff; therefore, espresso teaching sessions were rolled out, SHC study days with the national Shared Care lead. Monthly meetings were set up, 5 stages of SHC to allow easy identification and data collection, posters were displayed in waiting rooms to enhance patient engagement as well as patient feedback questionnaire and finally a robust data collection.

Results: Prior to project initiation the rate of SHC uptake across all dialysis centers was below 5%. It was noted a steady but consisted uptake of SHC across the OKU who resulted into a growth of the SHC project counting 160 patients participating in SHC, for a total of 36% as for September 2023.

Discussion: The OKU has 2 centres in Oxford and 6 satellite centres located in other towns and cities across the OKU's catchment area for a total of 500 patients. SHC describes an intervention whereby a patient is educated and facilitated to take on aspects of their care during HD treatments. These tasks can range from the basic: such as checking weight; or measuring their blood pressure, to more complex: such as programming the dialysis machine, needling their access, or heading towards a self-care treatment where patients would perform their treatment independently. There are benefits to both the patient and the centre if SHC is encouraged and promoted. Patients report an increase in energy, control

and understanding of their treatment, which can lead to increased confidence levels enabling them to improve their level of activation, allowing them to be less overwhelmed by their disease, and even to consider the transition to a home therapy[i]. There is also evidence to suggest that motivated and educated patients are more likely to achieve good fluid and phosphate control[ii],[iii] – both important markers of adequate hemodialysis treatment.

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Poster number: 018

Submission number: 411

Pruritus amongst in-centre haemodialysis population- a cross-sectional survey

Dr Shin Bey Ho, Miss Charlotte Nixon, Miss Toni Stanley, Dr Joanna Mckinnell, Dr Khai Ping Ng

Royal derby Hospital, derby

Biography
Dr Shin Bey Ho. Renal registrar in Royal derby Hospital

Abstract

Introduction: Pruritus is prevalent amongst patients with end stage renal failure, with 40% reporting moderate to severe symptom [1]. It remains an under-reported and under-treated condition with wide variable in the use of unlicenced medications [2]. KALM-1 study demonstrated significant reduction in itch intensity and improved quality of life (QoL) with difelikefalin treatment compared to placebo amongst haemodialysis patients with moderate to severe pruritus [3] and has recently been approved by NICE for its use [4]. To improve our awareness and management of this condition, we aim to examine the prevalence and severity of pruritus among haemodialysis patients in a single renal unit, assess its impact on their QoL and explore contributing factors.

Methods: We conducted a cross-sectional survey of pruritus symptom on all in-centre haemodialysis patient in a single renal unit using both 'worst itch numerical rating score' (WI-NRS) and '5-D itch scale' questionnaires, which examined the intensity, duration and distribution of pruritus as well as its effect on daily living. We defined moderate or severe pruritis as score > 4 in WI-NRS. Baseline demographics, clinical diagnosis, laboratory parameters and medications were retrieved retrospectively via local electronic renal database (VitalData). Data was analysed using SPSS v27.

Results: In total, 213 of the 288 in-centre haemodialysis patients completed the survey. Their mean age was 65 (SD:4) year-olds, 65% were male, 54% had a diagnosis of diabetes (type 1 and 2) and median dialysis vintage was 26 (IQR:53) months. Of these, 47% reported symptoms of pruritus, with 24% reported moderate to severe pruritus.

Amongst patients with moderate/severe pruritis (n=51), 35% (n=18) reported symptoms >12 hours/day, 94% (n=48) rated intensity of moderate or more over past two weeks, and 20% (n=10) noted a worsening pruritus past one month. 22% of them reported pruritus frequently affecting sleep or social activities. Pruritis predominantly affected the back (21%) and the scalp (18%). According to renal electronic record, 30% (n=15) with moderate/severe pruritus were prescribed either on antihistamines (9%), amitriptyline (15%) or gabapentin (6%). None was on difelikefalin at the time of survey. Only 12% (n=6) self-reported having medication for pruritus, with majority (n=11) felt it improved the symptom. Four patients with pruritus had pre-existing dermatological diagnosis, and none amongst patients without pruritus. There was no statistically significant difference in age, diabetes diagnosis, dialysis vintage, serum phosphate, parathyroid hormone and dialysis adequacy (Kt/V) between patients with moderate/severe pruritus and their counterpart.

Conclusion: In this study, nearly half of the haemodialysis patients surveyed reported pruritus, with significant proportion experienced moderate to severe symptoms, affecting sleep and social activities. While some were prescribed antihistamine, amitriptyline and pregabalin, it appeared that not all patients were aware of the treatment. This survey highlighted the issue of under-reporting of pruritus and emphasized the need for thorough review of treatment to improve symptom and quality and life amongst haemodialysis patients.

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Poster number: 019

Submission number: 454

The role of social prescribing in haemodialysis care: a qualitative description of two cases

Maisha Ahmed, Trishala Varma, Sajeda Youssouf, Tara Mastracci, Cassim Schott, Tadala Kolawole, Ben Oliveira, Katie Gallagher

Barts Health NHS Trust, London

Biography
Maisha Ahmed. I am the Healthy Living Advisor at the Royal London Hospital New Starters Dialysis Unit, supporting patients who have newly started dialysis to navigate healthcare and other services. My role includes triaging patients, signposting and referring them to relevant support services that best meets their needs, to deliver personalised care for all. My background is in Psychology and I have a deep passion for supporting people with their mental health, helping people to reach their potential and optimal well-being. I plan to pursue further training in Clinical/Counselling Psychology.

Abstract

Introduction: Social prescribing is a key component of the NHS Long Term Plan to improve health-related quality of life. It connects people to services in their community to meet practical, social, and emotional needs that affect health and wellbeing. Barts Health recently initiated a pilot project aiming to reduce health inequalities in our haemodialysis population. In conjunction with the Public Health team, funding was obtained for a Healthy Living Adviser (HLA) to support incident haemodialysis patients to address their social, financial, dietary, legal, and medical needs.

After screening a structured questionnaire was used to identify needs. The majority of patients (73%) benefited from referral to additional support services. We describe two cases in detail of 131 patients reviewed, demonstrating the breadth and complexity of the work involved.

Patient 1 was a 62-year-old male with ESKD, T2DM, hypertension and a history of alcohol excess. He had been living in short-term accommodation and was not previously known to renal services. A brain injury had left him unable to work. He had limited English and had not previously been able to discuss non-medical needs. The HLA spoke to him in his native language and EQ5D revealed feelings of depression. With consent, the HLA contacted his support worker. The patient was living in a hotel with no access to a washing machine, microwave, or fridge. The HLA explained the implications of end stage kidney disease and dialysis to the support worker. He was subsequently moved to a care home able to meet his needs. He was referred to physiotherapy and received a walking aid to address his poor mobility. The HLA also went through renal dietary advice that had been provided in the patient's native language and provided this to the care home.

Patient 2 was a 34-year-old female patient with ESKD due to T2DM, obesity, poor mobility, and a history of mental health problems. Issues including financial difficulties, resulting in a poor diet of low cost

ready meals, the need for psychiatric support due to depression and previous divorce, were identified. Psychiatric referral was made, and mobility aids were obtained. The Red Cross were contacted to support and provide care packages as she could not travel to get food without difficulty. She was signposted to a charity that provides free hot meals and a chance to interact with others to reduce feelings of loneliness. The patient reported enjoying cooking, and a recipe book from Kidney Care UK was provided to encourage cooking healthier meals. The patient was also signposted to charitable grants for assistance with bills and appliances and supported by the HLA in applying.

Examples of referrals from Renal Healthy Living Advisor

- Referrals to HCPs: Social worker, GP, Physiotherapist, Dietician
- Carer
- Mental Health
- Exercise
- Diet (advice and referrals)

Physical and mental health

- Benefits including disability allowance
- Pension
- Citizens Advice
- Kidney Care Grant
- Other financial support and advice

Financial support

- Housing
- Digital Support (For example, access to health records, completing forms)
- Travel
- Legal Advice (including advice for asylum seekers)
- Mobility (requests for a wheel chair or walking stick)
- Shower bags

Other

- Loneliness and isolation
- Befriender services
- Translation and Language
- Holidays - Freedom Dialysis
- Religious support
- Holistic and practical wellbeing support

Social and cultural

Discussion: These cases illustrate the challenges facing patients navigating a complex health and social care system, whilst undergoing a major upheaval to their lives in starting dialysis. The current medical model does not provide for holistic care to empower patients to manage their health. The support provided by the HLA enables an approach that takes into account the complex health and social care needs of our population.

Poster number: 020

Submission number: 459

Establishment of a Hep B vaccination programme.

Mrs Magdalena Cusick, Dr Zoe Pittman

University Hospitals of Royal Derby and Burton NHS Foundation Trust, Derby

Biography
Mrs Magdalena Cusick. The author is an experienced registered nurse with 8 years background of renal working in one of the East Midlands hospitals seconded to this post in January 2023.

Abstract

Introduction: Patients with kidney disease are at particular risk of HBV infection due to their increased exposure to blood products, haemodialysis, and an impaired immune response. It is recommended that all patients who require renal replacement therapy (RRT) [dialysis or kidney transplantation] should be assessed for current or past infection with Hepatitis B and offered vaccination against Hepatitis B virus (HBV) if indicated.

In 2019 commissioning responsibility and associated funding for Hepatitis B vaccination for patients with chronic kidney disease transferred from Primary Care to Specialised Commissioning.

NHSE was clear the responsibility to deliver Hepatitis B vaccinations to renal patients rests with the renal service and block payments were made to Trusts to facilitate this.

At this unit more than 800 patients required Hepatitis B vaccinations however, the major barrier to delivering this was a lack of workforce.

Methods: In January 2023 a 0.6 whole time equivalent (WTE) Band 5 Registered Nurse was seconded to establish and deliver this vaccination programme. In collaboration with the renal pharmacist a Hepatitis SOP and PGD was developed. Training needs were identified including generic immunisation training, the e-LfH e-learning module on 'Vaccine Preventable Diseases – Hepatitis B, the Trust's e-learning module on PGDs. Patients were identified and GP records were interrogated to establish who may have received vaccination in the community. Comprehensive patient information was developed and Vaccination and consumable supplies were coordinated.

3 clinics were created with the capacity to see almost 50 patients weekly. In addition, appointments were combined with routine nephrology follow up where possible

We identified a number of barriers to setup and uptake including:

Setup:

- Clinic room space,

- Training and sign off for Hep B vaccination
- Organising office space and equipment (laptop, phone etc).
- Ordering and storage of stock of Hep B vaccinations of different brands
- Time taken contacting GP's to check patient's Hep B vaccination status (this improved with access to SCR)
- Creating and maintaining a database of patients who require vaccination

Uptake:

- Cold calling patients to counsel on the phone (sometimes bad timing)
- Poor response to patient letters information about Hep B vaccinations and not getting many responses
- patients not turning up for their appointments as there was no automated NHS reminder message system in place

Results

The post was created in January 2023 and the first doses were given in 02/2023.

Since then the number of patients being vaccinated has continued to increase.

From October 2023 we've been able to increase available hours to 1 WTE which has improved accessibility for our patient group as well as increasing capacity. Prior to that we ensured that there was prominent literature in the outpatient areas and that the consultants were discussing the importance of vaccination in clinics. The nurse vaccinator is available at the time of clinics and patient information sessions to answer any questions and give doses if appropriate.

Doses	HBvaxPRO	Fendrix/EngerixB
1st	159	4
2nd	146	5
3rd	64	4
4th	N/A	8
Booster	16	16

Table 1 Doses delivered

Only a small number of those that have completed the course have had the post vaccination serology check to date. Hep B vaccination Responders (HBvaxPRO, Fendrix, Engerix) :

	Responder	Partial Responder	Non Responder
Full Course	18	19	17
Booster dose only	16		12

Discussion: The establishment of the Hepatitis B vaccination programme has been a success with an increasing number of patients achieving immunity. During the process we have developed a patient centred service that sits alongside our existing kidney care team.

Poster number: 021

Submission number: 489

A multicentre service evaluation of the role and impact of renal pharmacist participation in haemodialysis patient multidisciplinary team reviews.

<u>Miss Olivia Kanka</u>[1], Mr Issac Tseng[2], Ms Natasha Moore[3]

[1]Cambridge University Hospitals, Cambridge.
[2]Oxford University Hospitals Foundation Trust, Oxford.
[3]Guy's and St Thomas' NHS Foundation Trust, London

Biography
Miss Olivia Kanka. Senior specialist renal pharmacist at CUH since 2019. High cost drugs and medicines optimisation pharmacist for East of England renal network. Honorary Lecturer University of East Anglia.

Abstract

Background: Patients with end-stage renal disease (ESRD) who undergo chronic haemodialysis (HD) are associated with higher rates of mortality and morbidity, with cardiovascular deaths accounting for nearly 50% of mortality.[1] Dialysis patients are often non-adherent to dialysis management, including medication, leading to poorer clinical outcomes.[2,3] The renal Getting It Right First Time (GIRFT) national report supports the UK Renal Pharmacy Group (UKRPG) on the recommendation of dedicating 0.5 – 1.5 whole time equivalent (WTE) pharmacist in dialysis units. Renal pharmacists play an integral part of the multidisciplinary (MDT) care in the routine monthly review of dialysis patients, but variation in practice and service provision across renal units are common.[4,5]

Methods: A survey was designed and piloted by the members of the UKRPG Research and Development (R&D) Subgroup and disseminated to haemodialysis MDT review attendees in three participating renal centres. Survey was open for a three-week period in June 2023 for data collection and all submitted responses were anonymous. Data was input into Microsoft Excel for descriptive statistical analysis.

Results: Forty-eight responses received from consultant (n=11), registrar (n=7), dialysis unit manager (n=12), dialysis nurses (n=12), rotational pharmacist (n=1) and dietitians (n=4). Ninety percent (n=43) of the respondents indicate haemodialysis MDT reviews occur monthly. Whilst 75% (n=36) of respondents indicate a pharmacist attend the HD multidisciplinary (MDT) meeting, 25% (n=12) of responses conclude pharmacists rarely or never attend the routine dialysis patient reviews. Seventy-one percent (n=34) of participants felt the pharmacist's attendance to the MDT was extremely helpful. The survey found pharmacists are often involved in the prescribing (75%), but the responsibility is shared with other MDT members such as consultants, junior doctors and specialist nurses. The survey responses indicated the pharmacist roles most commonly involve prescribing dialysis and other renal medication, confirming patient medication history, providing advice on renal drug prescribing and prompting therapeutic drug monitoring. The qualitative feedback found that renal pharmacist's support on prescribing, helpfulness and specialist knowledge were amongst some of the qualities that are acknowledged and appreciated by the MDT attendees. The responses suggested stated that increased attendance of pharmacists in

monthly MDTs is an area for improvement. The disparity of existing service delivery should also be addressed to hone the equity of access to dialysis pharmacy services.

Conclusion: This survey identified the core roles and responsibilities of a renal pharmacist in the haemodialysis MDT reviews in current practice. Feedback on the existing service delivery and impact on patient care are overwhelmingly positive from the viewpoints of doctors, nurses and allied health professionals. However, there is currently no national guidance or benchmark tools to suitably measure the advanced pharmacy service delivery pertinent to this particular clinical activity. Further quantitative analyses are needed to establish the resources and time required for pharmacists to deliver more consistent and systematic delivery of services within the monthly MDT meetings, and improve equity of access to renal pharmacist's input in routine dialysis patient reviews.

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Poster number: 022

Submission number: 507

Intravenous Iron dosing for in patient haemodialysis patients and administration compliance.

Dr Ahmed Elsolia, Sister Joni Dizon, Dr Ana Statesco, Dr Dawood Misbah, Dr Helena Edward

Wessex Kidney Centre, Portsmouth

Biography
Dr Ahmed Elsolia. Renal Registrar

Abstract

Introduction: Intravenous Iron (IV Iron) stands as a pivotal element in the treatment of anaemia among haemodialysis patients, enhancing anaemia management and reducing the required erythropoietin dose to maintain target haemoglobin levels. However, we observed a concerning trend of missed IV Iron doses when dialysis patients were admitted to renal wards. Consequently, we initiated the Iron Compliance Project to address this issue, employing various strategies to enhance adherence to prescribed Iron regimens.

Plan: Our primary objective was to assess the current compliance with IV Iron in renal wards, introducing a Compliance measure as the ratio of administered doses to prescribed doses. We utilized electronic patient records (Vitaldata) to calculate the prescribed doses during a three-month period in early 2023, excluding patients with admissions shorter than one day or those who had deceased.

Study: During the specified three-month period, 37 doses were intended for administration, but only 18 doses were actually given, resulting in a compliance rate of 48%. Further investigation revealed that many patients received initial doses but missed subsequent ones.

Action: To address this issue, we aimed to increase compliance to over 75% within the next four months. Our interventions included regular educational sessions, integrating reminders into electronic patient prescriptions (Digimed), and opting for high-dose, less frequent Iron for inpatients.

Results: Following the implementation of these interventions, compliance improved significantly to 93%, with 41 doses administered out of 44 prescriptions. This positive trend is depicted in the run chart below. Interestingly, the use of a single Iron dosage notably contributed to improved compliance, as all single prescriptions were successfully administered, reducing the risk of missed doses compared to multiple-dose regimens.

Compliance

Before: Given 18, Not given 19
After: Given 41, Not given 3
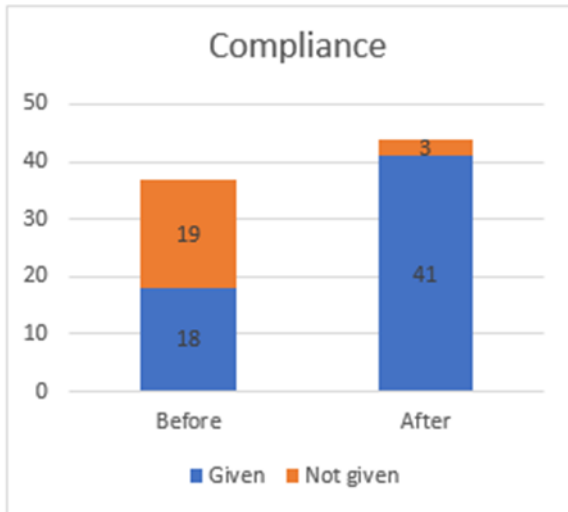
Discussions: Addressing compliance issues in IV Iron administration within renal wards is crucial for achieving optimal outcomes. Modifications to Iron replacement regimens may be necessary. Various Iron preparations have different recommended administration regimens; for example, Iron sucrose is suggested weekly at 100-200 mg during hemodialysis, while Ferric carboxymaltose can be administered as a total dose infusion of up to 1 gm. In our project, utilizing Ferric carboxymaltose for inpatients resulted in enhanced compliance and reduced burden on the inpatient nursing team. This emphasizes the importance of tailoring Iron regimens to specific patient populations to achieve improved adherence and, ultimately, better clinical outcomes.

Poster number: 023

Submission number: 541

Comparing effect of differing practice at two large renal units on infection in dialysis central venous catheters.

Dr Bhrigu Raj Sood[1], Dr Jyoti Baharani[2], Ms Tami Stevenson[2], Ms Heidi Jimenez[2], Dr Joseph DHLANDHLARA[1]

[1]Epsom and St Helier Hospitals NHS Trust, Carshalton.
[2]University Hospital BNHS Foundation Trust, Birmingham

Biography
Dr Bhrigu Raj Sood. Consultant Nephrologist and Lead for home therapies at St Helier Hospital, Carshalton . Quality lead for peritoneal dialysis access for London Kidney Network. Lead for ISN centre for Interventional Nephrology.

Abstract

Introduction: Infections related to dialysis access are a significant cause of morbidity and mortality in dialysis patients. Despite multiple guidelines and initiatives to promote dialysis through arteriovenous fistula, a significant number of patients still dialyse through tunnelled central venous catheters (TCVC). Units have varying rules around thresholds for infection markers before inserting TCVC with an aim to reduce the risk of line infection. C-reactive protein (CRP) is commonly used marker of inflammation used to monitor response to treatment during bacterial infections. We aim to compare the practices in two large renal units and their effect on the outcomes, especially incidence of repeat line infections in relation to the CRP at the time of TCVC insertion. These two units have differing practice with one team having a lower limit for CRP at the time of procedure.

Methods: We reviewed data 28 patients from each unit. Information was collected about circumstances of line insertion including cause of increased CRP, previous line infection and use of antibiotics at the time of procedure. Outcome data was collected on repeat line infection within 30 and 90 days, as well as any other infection in that time period.

Results: Average CRP of patients having TCVC was significantly different between two units - 93 (range 55 – 367, median 79) at Unit 1 and 37 (range 2-121, median 27) at Unit 2. Other variables were:

	Unit 1	Unit 2
Recent infection	23 (82%)	14 (50%)
Recent line infection	6 (21%)	0 (0%)
Ongoing antibiotics	12 (43%)	8 (29%)

Outcomes: 2 patients developed line infection within 30 days at Unit 1 (CRP 76 and 77 at baseline) and there was no other new line infection till day 90. Similarly 1 patient developed line infection within 30 days at Unit 2 (CRP 15 at baseline) and there were no new episodes recorded in 90 days.

	Unit 1	Unit 2
Repeat line infection (30 days)	2 (7%)	1 (4%)
Repeat any infection (30 days)	9 (32%)	1 (4%)
Repeat line infection (90 days)	0 (0%)	0 (0%)
Repeat any infection (90 days)	4 (14%)	NA

CRP at the time of TCVC insertion was not related to development of line infection in 30 and 90 days. Repeat line infection was similar at the 2 units despite differing thresholds of CRP at the time of insertion.

Discussion: The concern about morbidity and mortality from TCVC related infections has led to practices targeted at reducing that risk. Most of these practices are guided by intuitive response rather than research based clinical evidence. Delay in inserting a tunnelled line is associated with increased use of non-tunnelled temporary CVC associated complications and increased length of stay.

This is a good example of collaborative work between colleagues at different units to help understand impact of differing practices. A structured and collaborative approach is needed to develop strong evidence base around good practices to improve safety of procedures as well as outcomes for renal patients.

Poster number: 024

Submission number: 112

Utility of nursing target weight assessment tool in haemodialysis

Mrs Samantha Inger, Mr Peter Jurczak, Dr Richard Fluck, Dr Khai Ping Ng

Renal medicine department, Univ. Hospitals Derby & Burton

Biography
Mrs Samantha Inger. As Senior Sister on the renal dialysis unit, I recognise how important it is to improve patient outcomes whilst on haemodialysis. I am passionate about improving haemodialysis care and ensuring that tools are efficient and fit for purpose, given nursing time is so valuable. I have been a renal nurse for 11 years and a Senior Sister for 3 years. Alongside the clinicians, we are always striving to improve dialysis care.

Abstract

Introduction: Target weight assessment (TWA) is an important aspect of haemodialysis (HD) care. Under- or over-hydration negatively impacts on patients' symptoms and increases risk of adverse outcomes [1]. Historically, in our HD unit, TWA has been carried out by HD nurses using a clinical scoring system based on intradialytic hypotension, post-HD systolic blood pressure (SBP), peripheral oedema, symptoms of cramps of dialysis, recent hospital admission and change of appetite. However, it has not been implemented consistently in the recent years. Since the COVID pandemic, there has been a significant increase in number of in-centre haemodialysis (ICHD) patients which has impacted the nursing workforce. We therefore aimed to examine the feasibility of a revised nursing TWA tool.

Methods: This is a pilot quality improvement project of 57 ICHD patients. We performed a baseline, cross-sectional audit to examine the compliance of nursing TWA completion using the original TWA tool in December 2022. Following the audit, two consultant nephrologists revised and simplified the TWA tool by altering the parameters and weighting of the scores. The HD senior sister piloted nursing educational sessions on TWA and reintroduced the revised tool. A repeat compliance audit was performed in November 2023. We also examined the TWA outcomes based on the revised tool and its concordance with clinicians' assessment.

Results: The baseline audit found only 48% of patients had a nursing TWA completed. Issues of miscalculation of the scores and lack of confidence in using the tool were noted. Following the interventions, compliance of completion of nursing TWA increased to 72%. Of the 41 patients with completed revised nursing TWA, 68% were male with mean age of 69 (SD:14) year-old. For their TWA scores, 14%, 14% and 2% of patients recorded to have intra-dialytic hypotension within 30 days, post-HD SBP> 150mmHg and post-HD SBP< 100mmHg in last three sessions, respectively. Presence of peripheral oedema, symptoms of cramps on HD, having ≥3 in-patient days in last 30 days were noted on 19%, 4% and 4% of patients, respectively. 4% recorded worsening appetite whilst 34% recorded improving appetite. Based on the TWA scores, 14% had their TW reduced and 17% had their TW increased by nurses, whilst 69% had no change. Overall, clinicians' assessment agreed with 83% of the nursing TWA. Of the 17% (n=7) with disparity between nurses' and clinicians' assessment, two had complex medical

conditions requiring bioimpedance assessment, while five had no TW changed based on the tool but required minor TW adjustment by clinicians.

Discussion: This pilot study demonstrated that the revised nursing TWA tool is feasible and safe on an ICHD unit. Supported with education sessions, nurses were able to complete TWA on majority of the patients. The nursing TWA tool resulted in TW adjustment in 31% of the patients and showed good concordance with clinicians' assessment. We aim to roll it out across our whole ICHD unit of 250 patients and examine its impact on the monthly intra-dialytic hypotension and interdialytic weight gain index as well as blood pressure control in our future audit.

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Poster number: 025

Submission number: 334

Time to get calciphylaxis on clinicians' RaDaR? - A multicentre case series

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Biography
Sharon is Renal Dietetic Service Lead at Royal Devon University Healthcare NHS Foundation Trust and Honorary Senior Research Fellow at The University of Exeter. Sharon works clinically as an advance practice kidney dietitian and has a specialist interest in chronic kidney disease-mineral bone disorders (CKD-MBD). She currently chairs the UK CKD-MBD clinical study group and is co-lead of the UK calciphylaxis rare disease group; her research work focuses on the areas of both calciphylaxis and vitamin D metabolism in CKD.

Abstract

Introduction: Calciphylaxis is a rare, severe complication of chronic kidney disease mineral bone disorder. It is characterised by arteriolar calcification of the subcutaneous fat and dermis, and associated with a mortality rate of approximately 50% within a year of diagnosis. The reported prevalence of calciphylaxis in dialysis patients ranges from 1–4%. Between March 2012 and March 2020 the UK calciphylaxis study (UKCS) recruited 139 patients from 36 enrolled renal centres; an average of 1 case every 2.6 years per centre. The multicentre case series presented here includes patients from two NHS Trusts. The aim is to raise awareness of i) calciphylaxis and possible risk factors and ii) the UK registry of rare kidney diseases (RaDaR).

Methods: Patients were included if they had a diagnosis of calciphylaxis between 01.02.2020 and 01.02.2022. Data regarding demographics, dialysis modality, BMI, medications, and mineral bone parameters were collected from clinical databases. A representative sample of results was recorded from initiation of renal replacement therapy through to diagnosis of calciphylaxis. Data regarding calciphylaxis lesions, treatments and current vital status are summarised.

Results: 17 patients with end stage kidney failure (ESKF) and clinical features of calciphylaxis were included; 8 of 17 (47%) had a skin biopsy of which 6 reported evidence of calcification. Median age was 57 years (IQR: 50-74), BMI 26.8kg/m^2 (IQR: 22.9-31.1), 100% were white, 53% female and 59% had diabetes. Median time from onset of ESKF to calciphylaxis diagnosis was 5.5 years (IQR: 1-16). 53% (9 of

17) had history of recurrent hypercalcaemia (corrected calcium >2.55mmol/L) and 82% (14 of 17) recurrent hyperphosphatemia (phosphate >1.5mmol/L). 41% (7 of 17) had refractory secondary hyperparathyroidism. Warfarin therapy exposure was recorded in 47% (8 of 17) patients; a finding consistent with the literature. 76% (13 of 17) had received active vitamin D and 76% (13 of 17) a calcium-based phosphate binder. 76% (13 of 17) had lower leg lesions; 2 of whom also had upper leg lesions. 1 patient had a thigh lesion and 2 patients had an abdominal wound. Median follow up time was 8.5 months (range 1-24). 9 of the 17 patients remain alive, of whom lesions have completely healed in 6 patients. All patients received sodium thiosulphate and 1 (transplant patient) received hyperbaric oxygen therapy and sodium thiosulphate. Only 1 patient has been enrolled into RaDaR.

Discussion: Calciphylaxis is a devastating condition for which there are no proven treatments. In this case series a history of hyperphosphataemia, calcium-based binder, alfacalcidol, and warfarin use were common. It remains unknown why some patients develop calciphylaxis and others do not. National registry data, such as RaDaR, plays a crucial role in furthering knowledge and understanding of rare diseases; it helps to determine calciphylaxis incidence, and inform possible prevention and treatment strategies. Yet, in reality, few patients maybe being recruited into RaDaR. We propose that barriers to RaDaR recruitment need exploring, and if possible addressing, to ensure the data is as reflective as possible and offers the most impact.

Poster number: 026

Submission number: 333

A powerful collaborative network driving research in Alport syndrome: people living with Alport syndrome, clinicians, researchers and pharmaceutical companies

Susie Gear[1], Hannah Russell[2], Professor Colin Baigent[3], Professor Frances Flinter[4], Professor Daniel Gale[5], Professor Rachel Lennon[6], Dr Amanda McLean[7], Tim McLean[8], Jules Skelding[9], Alice Turner[10], Professor Neil Turner[11], Sam Clarke[12], Patrick Walker[13], Aura Zealey Smith[14]

[1]Chief Executive, Alport UK. Patient volunteer and parent of young adults living with Alport syndrome, Oxford. [2]Engagement and Fundraising Manager, Alport UK. Parent of a young person living with Alport syndrome, Bury St Edmunds. [3]Trustee, Alport UK. Emeritus Professor of Epidemiology, University of Oxford and living with Alport syndrome, Oxford. [4]Trustee, Alport UK. Emeritus Professor of Clinical Genetics at King's College London, London. [5]Trustee, Alport UK. Professor of Nephrology, University College London, London. [6]Trustee, Alport UK. Professor of Nephrology and Honorary Consultant Paediatric Nephrologist, Director of the Wellcome Centre for Cell-Matrix Research, Director of the Stoneygate and Kidney Research UK Alport Research Hub, Manchester. [7]Pharmacist NHS Lothian. Patient and parent of a young adult living with Alport syndrome. Strategic Advisory Board Member, Stoneygate and Kidney Research UK Alport Research Hub, Edinburgh. [8]Trustee, Alport UK. Clinical Operation Manager, European Huntington Disease Network (EHDN) and parent of a young adult living with Alport syndrome and kidney transplant donor, Edinburgh. [9]Trustee, Alport UK. Flower Farmer, patient and parent of a young adult living with Alport Syndrome, Tewkesbury. [10]Trustee, Alport UK. Fundraiser and friend of families living with Alport syndrome, Cheltenham. [11]Trustee, Alport UK. Emeritus professor of nephrology, University of Edinburgh, Edinburgh. [12]Volunteer, Alport UK. Documentary Director and Filmmaker. Person living with Alport syndrome, Reading. [13]Volunteer, Alport UK. Person living with Alport syndrome, London. [14]Volunteer, Alport UK. Medical Student. Person living with Alport syndrome, Winchester

Biography
Susie's passion is using her 30 years' experience in international business and dialogue to create a brighter future for those living with Alport syndrome. Susie finds it very humbling to collaborate with her fellow Trustees at Alport UK as they work with incredible people who live with Alport syndrome, amazing clinicians, inspiring laboratory scientists and business-focused pharmaceutical companies all round the world. Susie's career in international business started in the design and communications industry, followed by twelve years at management consultancy Accenture plc. Susie worked with multi-national organisations on complex culture change programmes to improve business performance. Susie then spent two years in the UK's Cabinet Office as Director of Change for the Civil Service. Susie now has a portfolio of roles that includes supporting patients living with Alports and supporting the delivery of outcomes in priority collaborations e.g. improving diagnosis, naming, clinical guidelines, outcomes for women living with Alport syndrome, and patient registries. As a creative person with a degree in

information design and training in motivational theory, Susie thrives on the privilege of engaging diverse teams developing new ideas. Susie's mother was diagnosed with Alport syndrome over 40 years ago and it impacts many members of the family.

Abstract

Background: Ten years ago, there were no specific treatments for Alport syndrome, limited research and no commercial companies involved. A group of people living with Alport Syndrome, partnered with individuals, families and the scientific community to set up Alport UK to:

- Facilitate a support network for individuals and families
- Develop high quality information
- Raise the profile of Alports
- Collaborate on the international research agenda – registries, clinical trials.

The international collaboration work of Alport UK created a virtual global network, advancing treatments and knowledge. This became known as the Alport Syndrome Alliance. Alport UK is a founding member.

Strategy: In 2014, the strategy of the Alport Syndrome Alliance:

- Research repurposed drugs (eg ACEi and Flozins) to delay the progression of kidney issues, inspired by x-linked Alport patients who can 'crash' into kidney failure at a critical stage in their lives coinciding with leaving home for work/further education, and transitioning to adult services.
- Develop a better understanding of the genetics of Alport syndrome to help develop gene-based therapies for the long-term.

Outcomes: Alport UK collaborated with national patient organisations and researchers to set up the Alport Syndrome Alliance and as a founding member:

- Delivered six transformative **international 'lock-in' workshops** (**https://youtu.be/QH8mDTmKaVU**). This created a vibrant international research community of 350+ researchers and patients engaged in 66 countries, with 50+ new research abstracts a year. 23 commercial companies are developing drug and gene therapy treatments with multiple international clinical trials ongoing.

- Encouraged a focus on patient-driven research and international publications eg:
  1. Investing time to get Alport-specific genetic data into RaDaR and contributed to a rare disease natural history paper in the Lancet.
  2. Focusing on Women and girls with Alport syndrome
  3. Improving diagnosis with international clinical guidelines including genetic testing.
- Prioritised interventions to encourage a research ecosystem to emerge, enabling a step change in research investment for the Stoneygate and Kidney Research UK Alport Research Hub to offer resources for pre-clinical testing to interested pharma companies and seed funding for UK research.

- Quickly adapted during Covid to reduce isolation for patients and researchers, using social media and a series of 30 Alport online workshops (**https://tinyurl.com/y9cuhgby**) to engage diverse audiences in 33 countries enabling the global community to thrive.
- Transformed the way young people live with Alport syndrome – from isolation to a renewed focus on careers, hobbies and living lives to the full, with helpful information and support about healthy lifestyles, family planning and avoiding harmful treatments.
- Supported other countries eg in the set up of a **patient organisation that supports tens of thousands of patients in China** (**https://youtu.be/icxhSHYTY8M**).

Future direction: Over the next 10 years, the Alport Syndrome Alliance will:

- Sustain the activities of the global network, advancing treatments and knowledge to build a cohesive organisation, rotating shared leadership, and continuing to use the principles that deliver results.
- Work with early career researchers to further develop specific areas of research, eg natural history and endpoint studies for clinical trials using RaDaR, and understanding potential genetic modifiers that impact outcomes for patients.

Poster number: 027

Submission number: 353

Evaluating a newly developed renal genetic service – quality improvement and service analysis

Dr Simon Williams, Mrs Paula Meah, Dr Matthew Howse

Liverpool University Hospital NHS Foundation Trust, Liverpool

Biography
Dr Simon Williams. I am a renal registrar in the Mersey Deanery. I recently undertook a year out of training in a sub-specialty clinical fellow role in which my chosen sub-specialty was renal genetics. I lead the development of a local renal genetics service, creating a new renal genetics pathway and clinic. This included working with the North West Kidney Network, in developing a regional service to provide an equitable access to genetic testing amongst renal patient across the North West. I have led the embedding of the service into practise within my trust and continue to lead the service alongside a renal consultant and local geneticist.

Abstract

Introduction: Inherited kidney diseases, although individually rare, collectively account for 5-10% of end stage renal disease (ESRD). Mainstreaming of genomic medicine resulting from the legacy of the 100,000 genomes project, has early indications showing 1-in-4 patients with rare diseases, received a diagnosis they would not have previously received.

Identifying a genetic cause of a patients' renal disease can aid prognosticating a patient's clinical course and guide management. With live donor transplantation affording the best outcome for patients with ESRD, it allows at risk family members access to predictive testing impacting live donor selection.

As the knowledge of genetic renal disease expands, the aim is for therapeutic options to be developed.

The local renal genetic service, set up eighteen months previously, was evaluated as part of the PDSA cycle, allowing further improvements to the expanding service.

Methods: A retrospective review of genetic testing on renal patients locally was undertaken. Outcomes of all cases referred for testing were reviewed.

An online proforma on our in-house Patient Electronic Notes System (PENS) had already been created allowing clear documentation of MDT decisions, as well as timing and indication of testing.

Ongoing data collection to evaluate the impact of the renal genetic clinic was collected in an automated fashion by creating a renal genomic electronic dashboard that extracted data from the Renal Genomic MDT form within PENS.

Qualitative data via consultant interviews were undertaken to evaluate the views of the service in its current form and its impact on the Polycystic Kidney Disease Clinic (PCKD) within which the genetics service sat.

Results: Seventy-four referrals have been made to the renal genetics service.

Sixty-six referrals were eligible for testing according to the National Genomic Testing Directory, with cystic kidney disease being the most frequent indication with thirty-four cases, followed by nine for haematuria, five for proteinuric kidney disease, and five for unexplained young onset ESRD.

Thirty-one results have been returned with twenty-two (70%) having a genetic mutation identified to explain the clinical phenotype.

Interviews with the renal consultants had identified widespread positive opinions of the service. However, with the renal genetics clinic sitting within the monthly PCKD clinic, concerns were voiced of the impact on clinic availability for PCKD patients and too few slots available for genetic testing to keep with the rate of referral.

Discussion: Since establishing a renal genetic service there has been a marked increase in referrals for genetic testing, demonstrating the under utility and inequitable access to genetic testing within our population previously.

The existing system was unable to meet the demand of increasing referrals. The workload involved with genetic testing including counselling and consenting patients, and associated administrative work compounded the evidence that the service had expanded beyond its existing format.

A standalone monthly renal genetics clinic was therefore created to allow extra clinic appointments. This was supported by the recruitment of a renal genetics' specialist nurse for half a day per week to assist with consenting patients in a separate clinic stream, plus assisting with the administrative work and the regional renal genetics MDT.

Poster number: 028

Submission number: 610

Introduction of Renal Genomic Nurse Practitioners across the North West Kidney Network

Amy Garraway[1], Hayley Nutall[2], Paula Meah[3], Toni Clough[4], Elizabeth Critchley[5], Joshua Storrar[4], Simon Williams[3], Alice Marsden[6], Helen M Stuart[7], Kate Hillman[8], Robert Finnigan[9], Vicky Ashworth[5], Prof Smeeta Sinha[4]

[1]Nephrology, Wirral. [2]Nephrology, Preston. [3]Nephrology, Liverpool. [4]Nephrology, Salford. [5]NHS England, Liverpool. [6]Genetics, Liverpool. [7]Genetics, Manchester. [8]Nephrology, Manchester. [9]NHS England, Manchester

Biography
My name is Amy Garraway and my background is all renal after first being exposed to dialysis as a newly qualified nurse in ITU. I loved renal then I still do now! After working in the dialysis unit over two sites for 12 years, I am now a Practice Educator, teaching both staff and patients. I love my job and feel very fortunate to be involved in this exciting project which is going to make a huge difference to so many patients lives

Abstract

Introduction: The Northwest Kidney Network established a genomic renal transformation programme in 2022. This multi-disciplinary programme brought key stakeholders together, including patients, geneticists, nephrologists, and nurse specialists to address:

1. Awareness/benefits of genomic testing within nephrology
2. Gaps in knowledge, barriers to accessing genomic testing and propose solutions
3. Equity of access to renal genomic services
4. Education and assessment need to enable a renal genomics service

Workshops identified that equitable access to genomic testing and information was an area of significant need within renal services and teams required further education and training on the topic.

NWKN received grant funding from the Northwest Genomics Medicine Service Alliance and Health Education England to conduct a quality improvement project, focused on developing a standardised regional renal genomics pathway.

Project monies funded redesign of the Northwest renal genomics pathway, educational resources, education events and the creation of a centralised website. In addition, local renal genomics services were established and a new regional MDT meeting.

Four, Band 7 Renal Genomics Practitioners were funded for 4hours/per week on a non-recurrent basis for 12 months; the posts were within renal services apposed to genetics services. Funding for MDT coordinator also provided.

Methods: The Practical steps to improving the quality of care and services using NICE guidance[1] and quality improvement principles were adopted. This included 'Plan, Do, Study, Act' (PDSA) and 30, 60, 90 cycles model for improvement[2].

Practice steps	Actions taken	Impact
Be informed	Information events Baseline data Introductions: Renal genomic MDT	• Embed Northwest renal genomics pathway. • Understand goals of service. • Identify inequity of access/barriers in renal genomic testing. • Understand baseline measures/data. • Embed roles within renal genomics MDT.
Take a lead	Peer support Stakeholder group MDT coordination Educational events	• Prioritise unified approach. • Identify local genomics educational gaps. • Raising awareness of the importance/benefits of genomics within Nephrology.
Understanding current ways of working	Scope current renal genomic services Shadow genetic teams Patient engagement	• Utilise baseline data, develop process maps. • Structure services on working models in specialist centres. • Patient collaboration.
Make a plan	Definition of role Regional clinic structure	• Equity of access to resource/genetic education. • Credible education package. • Clear dissemination of nurse practitioner roles. • Northwest approach with local influences addressed.
Improve and measure	Sustainability MDT communtion platform Specialist data	• MDT coordinator/practitioner combined role. • Equity of access of specialist genetic advice. • Safe information sharing. • Greater insight of benefits/outcomes.

Keep going	Business case Raise awareness	• Continuity of care. • Sustainability of services. • Embed genomic testing within diagnostic pathway.

Results & Discussion: The role of the Northwest renal genomic practitioners has been developed and now incorporates the following roles and responsibilities:

- Genetic education/awareness within Nephrology.
- Updated specialist renal genomics knowledge/guidance.
- Renal genomic clinics: education, consent, blood sample management.
- Patients follow up, chasing results, updating referring Nephrologist.
- Refer patients to the NW Renal Genomic MDT.
- Embed the NW Renal Genomics pathway.

Clinics commenced in January 2024. Data collected between January-May 2024 will be compared with baseline data from January–May 2023.

To date the Northwest renal genomics transformation programme has introduced:

- Design/implementation of a Northwest renal genomic pathway.
- Monthly Northwest renal genomics MDT.
- Electronic renal genomics referral platform.
- 4 renal genetic clinics based in Nephrology at 4 Northwest sites.
- 20 additional hours/week renal genomic clinics.
- 45 renal patients booked into local renal genomics services.
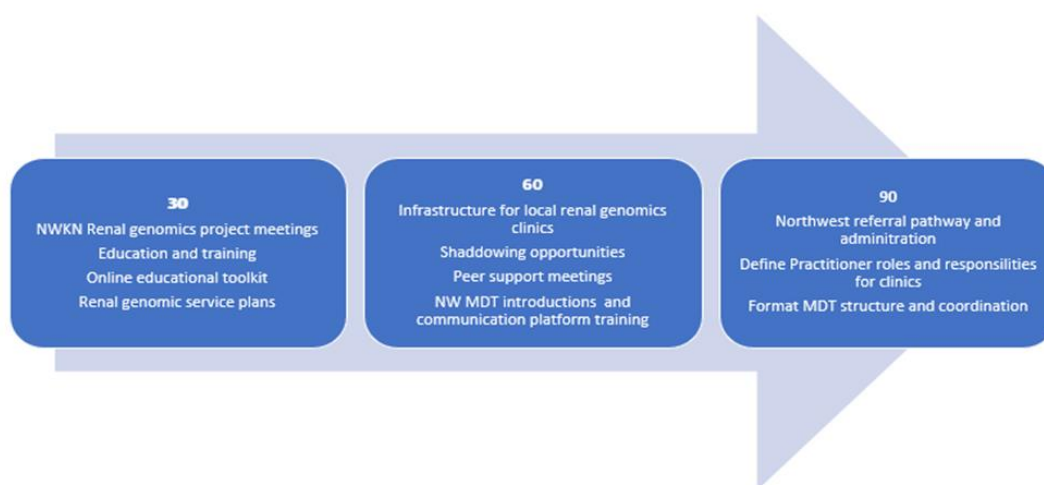
References

1. Practical steps to improving services using NICE guidance

2. Layout 1 (england.nhs.uk) Layout 1 (england.nhs.uk)

Poster number: 029

Submission number: 389

A Multidisciplinary Approach to Alport syndrome Management – Lessons from the Adult Nephrology Clinic

Dr Holly Mabillard[1,2], Professor John Sayer[1,2]

[1]Newcastle University, Newcastle upon Tyne.
[2]Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne

Biography
Dr Holly Mabillard. I am a renal registrar in Newcastle upon Tyne and commenced a MRC Clinical Research Training Fellowship in 2021 to undertake my PhD project, 'Deep phenotyping and precision medicine approaches to understand and treat autosomal dominant tubulointerstitial kidney disease (ADTKD) due to UMOD mutations'. I wish to improve genomic literacy amongst Nephrologists and intend on subspecialising in both genetic kidney diseases and CKD of unknown cause (CKDu) , a neglected area in Nephrology that accounts for a large proportion of our patient population.

Abstract

Introduction: Monogenic kidney diseases are a very common part of our daily practice as Nephrologists and our global understanding of genetic kidney disease is rapidly expanding. With many more patients being diagnosed, our genetic literacy and multidisciplinary management need to catch up to better serve these patients where data now shows that monogenic disease-causing variants among patients with Chronic Kidney Disease (CKD) is 20-30%[1][2].

Alport syndrome is a primary example of a multisystem monogenic disease where a patient's medical journey involves multiple primary and subspecialty providers. Characterised by haematuria, kidney failure, hearing loss and ocular abnormalities (lenticonus, fleck retinopathy), Alport syndrome presents a complex challenge requiring a comprehensive and multidisciplinary management strategy. 30% of patients have negative genetic testing suggesting the need for deep phenotyping approaches and academic collaboration[3]. Here, we outline the challenges and lessons learned from our genetic kidney disease clinic to highlight the benefits of an integrative approach to optimise patient outcomes.

Methods/Results: Genetic insights play a pivotal role in early diagnosis, risk assessment, reliable identification of affected family members and preconception counselling. Advanced genomic technologies can aid identification of genetically negative Alport syndrome, personalised therapeutic interventions, family counselling and identification of family members suitable for kidney donation. Nephrologists contribute their expertise in renal function preservation through tailored treatment plans, clinical trial recruitment, angiotensin-converting enzyme inhibitors, and emerging renal protective modalities such as SGLT2 inhibitors and non-steroidal mineralocorticoid receptor antagonists. Otolaryngologists play a crucial role in addressing sensorineural hearing loss, essential for preservation

of higher neural pathways, by employing innovative auditory rehabilitation strategies and cochlear implantation when necessary. Ophthalmologists play a key role in disease phenotyping in addition to treatments for the variety of ocular manifestations. Many available national organisations support the various psychosocial challenges of people living with Alport syndrome. These communities are a driving force for research, guideline, and treatment development internationally.

Discussion: We wish to emphasise the significance of a collaborative and multidisciplinary approach to Alport syndrome learned from our adult kidney genetics clinic. Fostering a holistic patient-centred model not only addresses the kidney manifestations but also incorporates genetic counselling, improved genetic diagnosis and specialised care for associated comorbidities. By synergising these diverse fields, we aim to enhance the overall quality of life for individuals affected by Alport syndrome, ushering in a new era of integrated healthcare management for monogenic kidney diseases which constitute a significant part of every Nephrologist's workload.

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The Influence of PKD1-Mediated Apoptosis Modulation on Proliferation and Autophagy in Human Embryonic Kidney Cells

Dr Ebtehal Ahmed, Dr Maria Fragiadaki

William Harvey Research Institute, Centre for Translational Medicine and Therapeutics (TMT), Lifelong Health Theme, Queen Mary University of London, London, UK

Biography
Ebtehal Ahmed is a post-doctoral research associate in the laboratory of Dr Maria Fragiadaki, based at William Harvey Institute, Queen Mary University of London. Her project is funded by a Future Leader's Fellowship (UKRI; MR/T04201X/2). After completing her bachelor's degree in veterinary medicine from Assuit University, Egypt in 2011, Ebtehal pursued a master's degree in veterinary pathology from the same institution. She then obtained her Ph.D. degree from the Regenerative Medicine and Stem Cell Institute at Kangwon National University, South Korea in 2020. Following her Ph.D., Ebtehal worked as a Senior Lecturer at the Veterinary Pathology Department of Assuit University, Egypt. Throughout her academic career, she has made significant contributions to the field and has published several research papers as both a first author and co-author. Ebtehal has also presented her work at various international seminars and conferences in Japan and Korea. Recently, in 2021, she served as a visiting researcher at the Centre for Advanced Biomedical Imaging, Division of Medicine, at the University College London. Currently, her project is focused on the undiscovered roles of PKD1, a gene causing ADPKD a devastating and common genetic form of renal failure.

Abstract

Introduction: Polycystic Kidney Disease (PKD) is the most common genetic cause of chronic kidney disease. It is a devastating multi-organ genetic condition affecting millions worldwide. Kidney cysts, excessive proliferation, apoptosis, and widespread fibrosis are the defining features of PKD. The condition arises from a mutation in Polycystic Kidney Disease 1 (PKD1), encoding for polycystin-1 (PC1), a large transmembrane protein. Loss of PC1 is linked with centrosome amplification and genomic instability, but the underlying mechanisms are unknown. To offer new therapies for PKD we must first understand how PC1 loss affects renal cell physiology. In this study, we will focus on the direct role of PC1 in controlling proliferation and apoptosis, two clinically relevant processes elevated in patients with PKD.

Methods: We investigated the multifaceted functions of PKD1 loss in Human Embryonic Kidney Cells (HEK293T), OX161c1, and SKI001. We silenced PKD1 using gene-specific siRNAs and verified gene knockdown by qPCR. We measured cell viability after silencing with a high-throughput MTT viability assay. The effect of PKD1 deletion on cell proliferation was examined via KI67 and PCNA immunostaining and quantification. Its effects on apoptosis and autophagy were tested via Cleaved caspase3,8 and LC3B immunostaining, respectively. We employed apoptosis-inhibitory small molecules (Z-DEVD-FMK, 10uM),

to examine the effect of PKD1 loss on viability in HEK293T cells and human ADPKD-derived cell lines (SKI001, OX161c1). Lastly, we generated spheroids to assess the effect of apoptosis inhibition in three-dimensional cultures.

Results: PKD1 loss led to a significant reduction in cell viability (39.35% reduction, P=0.0004), emphasizing the role of PKD1 in metabolic activity. To understand if the loss of viability was due to changes in proliferation or apoptosis, we carried out staining. Notably, PKD1 silencing did not significantly affect proliferation detected by KI67 or PCNA (n=4 independent experiments; P=0.2). Instead, loss of PKD1 led to a significant induction of apoptosis (42% induction, p=0.0119) which was comparable to the effects of the potent apoptosis-inducing agent, staurosporine (57.8% induction, p=0.0064). These data highlight the direct link between PKD1 and apoptosis. Use of the caspase-3 inhibitor (Z-DEVD-FMK) led to enhanced viability and reduced apoptosis in cells following PKD1 loss, showing that the observed reduction of viability in response to PKD1 loss was mediated by apoptosis and is independent of autophagy.

Discussion: Our study uncovers the critical role of PKD1 in controlling apoptosis and advances our understanding of ADPKD pathogenesis, offering potential therapeutic avenues to mitigate disease progression. These findings provide insights into the complex interplay of cellular processes governed by PKD1, emphasizing the role of control of apoptosis as a key function of PKD1.

Keywords: Apoptosis, PKD1, Polycystic Kidney Disease, Proliferation, Autophagy, HEK293T cells, Gene silencing.

10 year analysis of the epidemiology of kidney failure in young adults - A single centre study

Dr Gavin Esson, Professor John Sayer

Freeman hospital, Newcastle

Biography
Dr Gavin Esson. Renal ST5 in North East of England, Newcastle.

Abstract

Introduction: UK population-wide data is readily available for adults on kidney replacement therapy, however there is less data available on young adults. Young adults (<40 years old) provide a unique category of patients, in which the causation and burden of disease may be different to older adults. It is important to understand these differences as they may influence transplant status, graft survival, and overall mortality – especially where the cause of end-stage renal disease is due to modifiable and treatable factors. Of particular interest to our unit was the impact and burden of genetic diagnoses causing, or contributing to, end stage kidney disease in young adults.

Methods: Over a 10 year period from 2013-2023, we analysed the epidemiology of all young adults (ages 18-40 years) who were started on renal replacement therapy in the Freeman Hospital renal unit, North East England, between 2013 and 2023. Diagnoses were taken from outpatient documentation, and we noted if this was confirmed with genetic testing. Diagnoses were grouped together in an identical way to the UK renal registry data. Additionally, we created a new category termed "genetic causes" which included monogenetic causes of end stage renal disease. We compared our results to UK registry data annual report (2021) for young adults aged 18-44.

Results: We identified 141 adults aged between 18-40 years old who started kidney replacement therapy between 2013 and 2023. The diagnoses are shown in figure 1a. Glomerulonephritis was the most common cause of kidney failure (28%) followed by other (23%), diabetic kidney disease (21%), , genetic (10%), unknown (8%), polycystic disease (7%), hypertensive (3%), pyelonephritis (1%). Figure 1b shows the UK wide data for adults aged 18-44. A subgroup analysis of the genetic causes (including polycystic kidney disease) are shown in figure 2. The most common genetic diagnosis was ADPKD, followed by Alport syndrome. There were 9 ''rare' genetic diagnoses. In total, 58/141 (41%) of patients had genetic testing.

Discussion: These results show that overall, there were generally similarities between our cohort and the UK renal registry data on young patients starting kidney replacement therapy. The majority of patients in both cohorts had glomerulonephritis, diabetic kidney disease, or "other".

Notably to our data, a significant proportion (10%) of young adults progressing to kidney failure have a monogenetic diagnosis, with this number increasing to 17% when including polycystic kidney disease.

There is minimal UK registry data showing the prevalence of monogenetic kidney disease in young dialysis populations. While individual genetic diagnoses may be considered rare, this data shows that when taken together as a group, inherited kidney disease is a significant cause of end stage kidney disease. Furthermore, whilst 41% of our cohort had genetic testing, the majority (59%) did not. Recent data suggests a significant percentage of patients initially diagnosed with unknown, hypertensive, and diabetic kidney disease have been subsequently found to have monogenic causes of kidney disease[1], therefore the true prevalence of genetic kidney disease may be higher still.

An apparent issue with the UK registry data is that genetic causes of kidney failure come under the "other" umbrella. Given the significant prevalence, it may be beneficial to create a separate subcategory for these cases. This would aid recognition and perhaps prompt an increase in genetic testing. It would also allow for epidemiological data on this cohort to be more readily available.

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Poster number: 032

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Real-life efficacy of Tolvaptan for Polycystic Kidney Disease (PKD) and association with patient adherence in London North-West specialist clinic

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Biography
Dr Zahra Mohamedali. IMT doctor in Renal Medicine at Imperial College Healthcare NHS Trust. Qualified Bachelor of Medicine, Bachelor of Surgery, Kings College London 2020, Distinction in Pre-clinical Medicine (2016), Distinction in Clinical Medicine (2018), First class iBSc in Clinical and Molecular Endocrinology

Abstract

Introduction: Tolvaptan is approved by NICE in the treatment of PKD after randomised controlled trials demonstrated a reduction in decline in eGFR. Aquaresis occurs as an effect, and this may limit tolerability as the second dose in a day causes nocturia and disturbed sleep. Thirty-three patients in our specialist PKD clinic were treated based on criteria of bipolar renal length >=15cm and decline in eGFR by > -5ml/min/yr. We evaluated their real-life outcome regarding measures of adherence including an adapted Basel Assessment of Adherence to Immunosuppressive Medication Scale © (by permission http://baasis.nursing.unibas.ch/) originally validated for immunosuppression medications in transplant patients. A further 24 patients had finished treatment at our centre and were excluded as BAASIS could not be applied in hindsight. However, they illustrated a notably high level of intolerance leading to cessation in 16/24 (9 with nocturia, 4 transaminitis, 1 angioedema, 1 rash, 1 fatigue) emphasizing the importance of this work on adherence and response.

Methods: BAASIS addresses recall of treatment adherence in the preceding 4 weeks, all 33 patients currently treated as of 16/1/24 were screened on telephone by two independent auditors with a standard non-judgemental introductory script designed to result in candid engagement. Investigators were blinded to renal outcomes. A decline in eGFR of less than 5 ml/min/yr was defined as treatment response.

Results: Of the 33 patients included, 14 males and 19 females, median age 49yrs (range 32-72), were on treatment for a mean of 2.7yr (SD 2.2, range 0.3-7.5). Mean eGFR (CKD-EPI) was 58ml/min (SD 19, range 28-110) at start and 48ml/mi (SD 23, range 17-102) at end of treatment. Median total daily dose was

120mg/d (range 60-120). Attendance at clinic for monitoring was 100%. 18/33 patients had responded to treatment, with delta eGFR –0.1ml/min/year (SD 3.4) versus non-responders' delta eGFR –13ml/min/year (SD 8.7)

There was a total of 35 instances of non-implementation in 23/33 patients with missed (20 instances), delayed (13 instances) or self-alteration in doses (2 instances). Only 10/33 patient made no failure to implement Tolvaptan at any time. There were 9 patients with non-persistence of Tolvaptan treatment.

Associative analysis of renal outcome with adherence was made for all 31 patients who had more than 6 months treatment, 2 patients being excluded because treatment had been too short-term. 25/31 had non-adherence defined by non-implementation or non-persistence or both, but this did not statistically associate with treatment failure ChiSq 1.951 p=0.16. The element of non-implementation alone was however associated with treatment failure ChiSq 4.949 p=0.03, this term includes patient behaviour of not taking and mistiming drug taking, and patient-initiated dose reduction and drug holidays.

Discussion: Just over half (55%) of currently treated patients had made a clinical response to Tolvaptan. 23/33 patients had non-implementation within the 4 weeks preceding the validated adherence survey, and this was significantly associated with treatment failure. This study is limited to a small single-centre patient cohort but could easily be applied more widely. This study informs shared-decision making and we should encourage our patients to take this high-cost drug in the right amount and at the right times, and notably not to miss doses, thereby to achieve higher clinical response rates.

Poster number: 033

Submission number: 540

Improving Care Co-ordination for Patients with Tuberous Sclerosis Complex (TSC): The role of the TSC Clinical Nurse Specialist (TSC-CNS)

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Biography
Miss Lydia Israel. Philippines in 1997. She has held various roles in the NHS since 2001 - working in renal and intensive care - and in the last four years has been the Clinical Nurse Specialist for Tuberous Sclerosis Complex at St George's Hospital, helping coordinate the care of the largest TSC patient cohort in the UK.

Abstract

Introduction: Tuberous Sclerosis Complex (TSC), caused by *TSC1/TSC2* mutations, occurs in around 1:6,000 births, affecting >10,000 people in the UK. Upregulation of the mammalian target of rapamycin (mTOR) pathway leads to characteristic benign tumours in the brain, heart, lungs, kidneys, eyes, & skin. Brain involvement is frequently complicated by epilepsy, learning disability, and TSC-Associated Neuropsychiatric Disorders (TAND), which may significantly impact patient access to education and healthcare[1,2].

Over 80% of patients develop benign kidney angiomyolipomas (AMLs); many develop cysts, chronic kidney disease (CKD), or rarely, kidney cancers; 5% of patients have a contiguous *TSC1/PKD2* mutation, associated with a more rapid progression to end stage kidney disease (ESKD)[1]. Many patients require input from multiple healthcare disciplines, education and social care. In 2016, approval was given by NHS England to use mTOR inhibitors (mTORi) to treat growing AMLs, thus preventing life-threatening bleeding, leading to the creation of the TSC-Renal clinic, enabling mTORi therapy initiation and monitoring for more patients, and complementing the TSC-Genetics clinic[3,4].

Clinical nurse specialists (CNS) complement patient health-care: convening multiple disciplines involved in co-ordinated care, involving families & carers, facilitating patient-centred care. Twenty UK NHS trusts offer a TSC service: few have a dedicated CNS to support co-ordinated patient care[5]. We sought to evaluate the impact of introducing a TSC-CNS to improve care coordination at our service for this group of complex, often vulnerable, patients.

Methods: The TSC-CNS post commenced on 16/12/2019. Clinic activity for each TSC clinic was measured annually between 2019-2023, and similarly for a novel TSC-CNS-led clinic. Serial audits were performed for 10 patients, randomly selected, in 2020, 2021 and 2023 against the UK guidelines for the management and surveillance of TSC (UKGMST)[4]. Data for adult MRI scans and procedures under general anaesthetic (GA) were monitored annually. Data for unplanned contact (email/phone) activity was monitored throughout the study period.

Results: Between 01/01/2019-31/12/2023, the number of patients under surveillance in the TSC-Genetics clinic grew from 239 to 444; numbers for mTORi therapy in the TSC-Renal clinic grew from 66 to 107. There has been a corresponding increase in: patients seen in TSC-Genetics (15.5/month-16.1/month), TSC-Renal (10.6/month-12.08/month); nurse-led TSC clinics (0/month-7.5/month); completed scans under GA (9 in 2019; 16 in 2023), with five independent procedures under GA between 2022-2023.

The TSC-CNS supported an evolution toward mixed face-to-face and virtual clinic appointments (0:0 in 2019 to 70:30 in 2023), and increased numbers of unplanned contacts. These developments have been associated with excellent patient satisfaction, and maintenance of TSC service delivery standards, measured against the UK GMST over the pandemic and beyond.

Discussion: Safe expansion of TSC services has been achieved through central care co-ordination, supported by the TSC-CNS. The introduction of the TSC-CNS role has been associated with an increase in clinic activity in all TSC clinics, and increased capacity to safely monitor patients on mTORi therapy through the nurse-led clinic, reflecting an improvement in access to treatment and healthcare.

Patient satisfaction surveys highlight the value of the CNS, as a dedicated specialist to help answer questions, reassure, and signpost.

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Modelling Diabetic Kidney Disease in Drosophila melanogaster Nephrocytes (fly podocytes)

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Biography
Lulwah Y. AlShamali has obtained her bachelors degrees from Arizona in the United States of America in and has continued to obtain her Masters degree in Genomic Medicine at the Barts and The London School of Medicine and Dentistry – Queen Mary with a focus in myocarditis and is currently a third year PhD student at the Bristol Medical School, researching kidney disease and nephropathy, and type II diabetes. She is a demonstrator for medical, dental, biochemistry and molecular biology students and has seven years of experience at the Ministry of Health in Kuwait, working as specialist at the Chest and Heart Diseases Hospital and the Kuwait Cancer Center specializing in hematology, cancer genetics and stem cells.

Abstract

Introduction: Type 2 diabetes mellitus, accounting for 90-95% of diabetes cases, is a metabolic disorder marked by hyperglycemia due to insulin resistance. Diabetic kidney disease, affecting about 40% of diabetic patients, is the leading cause of end-stage kidney disease globally. In the kidney, glomerular podocytes play a crucial role in filtration. Podocyte dysfunction, evident in early DKD stages, includes changes in cell shape, foot process effacement, proteinuria, and glomerular basement membrane thickening. This project examines the excretory system in Drosophila melanogaster, a model organism with a renal system of nephrocytes, similar to podocytes, and Malpighian tubules. Nephrocytes are vital for waste elimination and homeostasis. Nephrocyte abnormalities, like in human podocytes indicate EKD, offering insights into DKD pathophysiology and potential treatments.

Methods: *Drosophila melanogaster* W118 was placed on a standard diet (0.15M sucrose- nondiabetic) and a high sucrose diet (1M sucrose-diabetic), to observe effects of chronic HS diet due to the nature of nephrocytes analogue to podocytes both in structure and function. Control (W118) flies were crossed with Dorothy-Gal4>UAS-InR^{DN} flies, enabling pericardial nephrocyte specific expression of Green Fluorescent protein (GFP) for imaging on days 7, 15 and 21. Survival assays were performed to observe survival rate of female and male diabetic and nondiabetic flies. Glucose assay was performed to quantify the hyperglycemia levels in hemolymph of female and male diabetic and nondiabetic flies and weighed.

Results: A high sucrose (HS) diet resulted in significant hyperglycemia in both sexes with an average hemolymph glucose measurement in HS males of 42.2 mmol/L in comparison to 23.1 mmol/L in non-diabetic male controls. HS females glucose was 46.6 mmol/L in comparison to 27.7 mmol/L in non-diabetic control females (50 combined flies for each condition (repeated n=3). Figure 1. shows morphological changes occurring to control (W118) flies crossed with Dorothy-Gal4>UAS-InR^{DN} flies on HS diet and control diet imaged at days 7, 15 and 21. Nephrocyte average number (figure 1) was

reduced on a HS diet from 31 (control) to 24 (HS) (average of 24 flies in each condition – P<0.0001). Area of nephrocytes (figure 1) was also reduced from 5μm^2 on nondiabetic diet to 2μm^2 on HS diet (average of 24 flies P<0.0001). Solidity and circularity also altered in diabetic compared to non-diabetic flies. Diabetic HS female flies had 17% reduced life survival compared to female nondiabetic flies; diabetic HS male flies had 16% reduced life survival compared to male controls. Female flies on diabetic diet appeared to be the heaviest averaging 0.015g in comparison to female controls that weighed 0.012g. Interestingly male flies on a diabetic diet had the lowest weight averaging 0.007g in comparison to male controls averaging 0.008g. Thirty flies from each condition weighed day 21 (repeated n=3), performed a t-test respectively; comparing male diabetic HS flies and male nondiabetic flies showed significance P<0.0001; and female HS diabetic in comparison to female nondiabetic flies showed significance P<0.0001 and male diabetic HS flies showed decrease in weight to female diabetic HS flies weights showed a statistical significance of P<0.0001.

Discussion : We have successfully developed a fly model of diabetic kidney disease which will be useful for studying this condition in the future.

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Genomic Notes for Clinicians (GeNotes): an online 'just in time' educational resource to support renal healthcare professionals through the genomic testing pathway

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Abstract

Introduction: As mainstreaming of genomic medicine, particularly genomic testing, is being implemented rapidly throughout the NHS in England, it is critical that healthcare professionals are effectively upskilled in a timely fashion (1). Genomic Notes for Clinicians (GeNotes) is an NHS England National Genomics Education freely accessible, online, 'just in time' educational resource, designed to meet this need. Content is aligned to the National Genomic Test Directory and supports clinicians, at the point of care, to identify when and how to request genomic tests and return results ('In The Clinic'), and provides linked information on core genomic concepts, specific genetic conditions, genomic technologies and genomics in action ('Knowledge Hub'), for extended learning. GeNotes is underpinned by robust governance and funding, and resources are developed by multi-professional, specialty working groups ensuring that the resource is sustainable and updated regularly. Renal content to support mainstreaming in nephrology will be launched on the public beta website in June 2024.

Methods: Prior to the launch of content on the public beta website, we assessed ease of access and navigation, likelihood of use and content of oncology, paediatrics and primary care GeNotes resources, in order to test the format and its application to other specialties. Usability testing took place between September 2021 and March 2022 and comprised user testing sessions in which participants completed a series of tasks using GeNotes by following a relevant clinical scenario. Data were collected via moderated user testing sessions, a feedback questionnaire and follow-up interviews. The sessions and interviews included a System Usability Scale (SUS) assessment (2).

Results: 14 user testing sessions, 74 feedback surveys and 15 follow-up interviews were conducted. Respondents included consultants, general practitioners, trainees, and non-medical healthcare professionals working across quaternary, tertiary, secondary and community healthcare across various

UK regions. 88% said they would be likely or very likely to use GeNotes in the future. The mean SUS score was 89, indicating a high usability (the mean score for digital services is 68). Respondents reported that content is easy to navigate and appropriately detailed. These findings support the roll-out of the format to other specialties, hence the establishment of the renal GeNotes working group. Both adult and paediatric renal resources are in development and aligned with the UK Kidney Association rare disease groups, and Genomics England's Generation Study, covering topics such as cystic renal disease, haematuria, proteinuria, renal tubulopathies, and congenital anomalies of the kidneys and urinary tract (CAKUT).

Discussion: User testing suggests that GeNotes is a well-received, highly usable educational resource appropriately pitched at a variety of healthcare professionals working across various specialties. The continued development of renal resources will support the mainstreaming of genomics in nephrology, ultimately resulting in improved diagnosis and management for patients and their families. Further work is required to improve accessibility by exploring other routes of access, such as a mobile application.

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Poster number: 036

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Analysis of the characteristics of IgA nephropathy patients using real-world data from five European countries

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Abstract

Introduction: Immunoglobulin A nephropathy (IgAN) is the most prevalent primary glomerulonephritis globally, with a significant health burden and a variable disease course. As IgAN is a heterogeneous disease, it is important to appreciate patient characteristics to understand disease progression and tailor treatment regimens.[1] To determine the patient characteristics associated with IgAN, a physician questionnaire and patient chart audit were conducted.

Methods: From 21 December 2022 to 6 February 2023, physicians from France, Germany, Spain, Italy and the UK completed a questionnaire and chart review. Physicians were required to have ≥50 patients with stage 1–4 chronic kidney disease (CKD); at least four of these were required to be non-dialysis IgAN patients. Patients whose charts were included were required to be 12 years or older, non-dialysis IgAN patients with an estimated glomerular filtration rate ≥15 mL/min/1.72 m^2. The charts included were from patients who had seen a participating physician within the prior 6 months.

Results: 261 physicians answered the questionnaire and completed chart audits on 473 of their most recently seen patients. Charts audited were largely from male (71%) Caucasian (78%) patients from 31–49 years of age (38%). 22% of patients were referred to their current physician within the past year. 70% were referred by a primary care physician and 9% by another nephrologist. Of those referred by a nephrologist, 32% were referred for specialised care. Participating physicians perceived that close to 30% of patients were referred to them late or extremely late, with contributing factors including lack of engagement from patients with follow-ups and patients remaining asymptomatic for a long time. At the most recent visit, 24.3% had CKD stage 1 or 2, 26.6% of patients had CKD stage 3a, 30.4% had stage 3b and 18.6% had stage 4 disease. The symptoms reported with greatest frequency at the most recent visit included fatigue (59%), blood in the urine (41%) and increased weight gain (41%). In total, 71% of patients had proteinuria >0.5 g/day (8% had no values available), 8% of patients had nephrotic syndrome. 54% of the patients whose charts were audited had comorbid hypertension. Other comorbidities included hyperlipidaemia (22%), obesity (17%), type 2 diabetes (15%) and peripheral oedema (7%). Counterintuitively, when asked about the overall health of their patients, physicians perceived 98% to be in good or excellent overall health. Patients were prescribed five medications on average, with 92% taking an angiotensin-converting enzyme inhibitor and/or angiotensin receptor blocker. 66% of physicians felt that patients completely adhered to their treatment regimen. However, 54% of physicians reported some form of dissatisfaction with patient response to the overall treatment regimen; though, levels of satisfaction varied between individual treatments.

Discussion: Physicians often perceived patients as being in good health despite high levels of proteinuria and many being in late-stage CKD, highlighting a potential gap in their understanding of the disease course of IgAN. This perception may lead to late diagnoses and referrals. These findings highlight an unmet need for early diagnosis and treatment of IgAN to ensure timely and appropriate care.

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Poster number: 037

Submission number: 109

Impact of incremental peritoneal dialysis on cardiometabolic parameters - a retrospective cohort study

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Biography
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Abstract

Introduction: Glucose remains the predominant osmotic agent of peritoneal dialysis (PD) fluid. Higher systemic glucose exposure is linked to insulin resistance and consequent cardiovascular morbidity. Standard full dose PD is associated with greater cumulative glucose exposure, compared to incremental PD. However, there is limited evidence on the impact of incremental PD on cardiometabolic parameters. Therefore, the aim of this study was to evaluate the impact of incremental PD on cardiometabolic measures.

Method: This was a retrospective study with a 2 year follow up period. The John Walls Renal Unit research database was interrogated for data pertaining to adult patients who had received PD up until 2022. The eligibility criteria included a minimum vintage of 12 months and a 24-hour urine volume of at least 500mls at the onset of PD. Demographic and clinical data, including PD prescriptions, were collated, Cardiometabolic parameters including dry weight, BMI, Hba1c and cholesterol levels were collected as outcome measures, at 6 monthly timepoints. The identified cohort were categorised into incremental PD and full dose PD groups, based on prespecified criteria. A descriptive analysis was undertaken to evaluate baseline differences between cohorts. Generalised linear mixed methods analysis was used to evaluate the effect of incremental PD on the trend in outcome measures.

Results: 117 (incremental = 46; non-incremental = 71) patients were included in the study. The cohort was predominantly of male sex (53%) and white ethnicity (76%). There was no significant difference in baseline demographic or clinical parameters, except for Hba1c which was lower in the incremental cohort [5.3 (5.2 -6.6)] compared to the non-incremental cohort [6.6 (6.0 – 7.5), p = 0.04]. 11 patients in the incremental cohort had a dose escalation during the study period, 4 of whom reached full dose.

The mean estimated cumulative glucose exposure was substantially lower in the incremental cohort [74.5 (68 - 90.2) kg at 24 months] compared to the non-incremental group [119.2 (112.6 -125.7) kg at 24 months, p = < 0.001]. After considering baseline characteristics (age, ethnicity, sex, diabetes status and index of deprivation), there was no statistically significant difference in BMI [Coefficient for incremental vs standard PD*time = 0.014 (- 0.001 to 0.029)], dry weight [Coefficient for incremental vs standard

PD*time = 0.007(- 0.004 to 0.018)] and cholesterol [Coefficient for incremental vs standard PD*time = 0.00 (-0.02 to 0.021)] trends between the groups. There was also no significant difference in Hba1c in the diabetic subgroup [Coefficient for incremental vs standard PD*time = 0.008 (- 0.013 to 0.052)].

Discussion: Despite differences in cumulative glucose exposure, there was no statistically significant difference in cardiometabolic trends between patients who started PD incrementally and those who did not. The study limitations include selection bias, confounding and the lack of information pertaining to dietary intake, physical activity, insulin use and other measures of insulin resistance. A suitably designed clinical trial is needed to determine whether incremental therapies have an impact on cardiometabolic parameters and cardiovascular risk in PD patients.

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A real-world observational study on the prophylactic use of mupirocin ointment in reducing PD catheter exit site infections

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Biography
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Abstract

Introduction: Peritoneal dialysis (PD) catheter exit site infections (ESIs) pose a serious risk to the continuation of peritoneal dialysis (PD) as this can predispose one to tunnel infections and PD peritonitis. Further to ISPD recommendations, the Salford Royal Hospital PD-associated infection prevention guideline was updated in 2021 to advocate the application of 2% Bactroban (Mupirocin) nasal ointment as prophylactic treatment at the PD catheter exit site during each dressing change. This study aimed to assess the effectiveness of applying mupirocin ointment to prevent PD catheter ESIs and ensure there were no adverse evolutions in the causative organisms.

Methods: This single-centre observational study was conducted by retrospective review of electronic patient records of the patients recorded with PD catheter ESIs. A comparison was made between ESI cases in 2019 (group 1: 58 patients) and 2022 (group 2: 30 patients) (i.e. before and after the introduction of prophylactic Mupirocin application). Data including demographic information, microorganisms, associated complications and subsequent management (tunnel infections, peritonitis, and catheter removal or repositioning) was collated and analysed.

Results: The ESI rate was 3.8% in 2019 and 2.6% in 2022. The median age of our cohort was 62 years (range 42-72) with Male (76%) and White ethnicity (82%) predominance. The time interval between PD

catheter insertion and ESI was noted to be shorter in 2022 (3.7 vs 8 months; p=0.03) **(Table 1)**. *Staphylococcus Aureus* was the most common organism with a two-week course of flucloxacillin being the standard management approach **(Table 2)**. Complications associated with ESIs remained statistically similar between the 2019 and 2022 groups **(Table 3)**.

Conclusion: Our results show a 32% reduction in ESI rates in 2022 compared to 2019, suggesting the prophylactic application of mupirocin ointment has effectively reduced rates of PD exit site infections in our centre. Importantly, there was no increase in gram-negative organism-associated infections.

Table 1: Clinical and laboratory characteristics of the exit site infection cases

Characteristic	Total (88)	Group 1 (2019) (58)	Group 2 (2022) (30)	P-value
Age	62 (42-72)	64 (48-77)	52 (41-68)	0.044
Gender, Male	67 (76.1%)	49 (84.5%)	18 (60%)	0.011
Ethnicity, White	72 (81.8%)	55 (94.8%)	17 (56.7%)	<0.001
PD catheter insertion, Medical	64 (72.6%)	42 (72.4%)	22 (73.3%)	0.927
PD modality, CAPD	54 (63.5%)	34 (58.6%)	20 (74.1%)	0.168
Time between PD catheter insertion and infection, months	7 (2-16)	8 (3-18.5)	3.7 (0.6-11)	0.035
Continuous variables are expressed as median and inter-quartile range and p-value by the Mann-Whitney U test. Categorical variables are expressed as a number (%) and p-value by the Chi-Square test.				

Table 2: Causative microorganisms found in the exit site infection cases

Type	Organism	Group 1	Group 2
Gram Positive	MRSA	2	
	Staph. aureus	37	9
	Enterococci	1	
	Group B Streptococcus	1	
Fungal	Candida parapsilosis	1	2
Mixed	Anaerobes	2	1
	Mixed skin flora	12	13
Gram Negative	Serratus Marcescens	4	
	Klebsiella Oxytoca	1	3
	Pseudomonas	5	3
	Mixed Coliforms	7	2
	Raoultella Ornithinolytica	1	
	Enterobacter Asburia		1
	E.coli	2	

Table 3: Complications and subsequent management of the exit site infection cases

Parameters	Group 1 (58)	Group 2 (30)	P-value
Recurrent Infections	18 (31%)	6 (20%)	0.271
Exit site infection leading to PD peritonitis	4 (6.9%)	4 (13.3%)	0.319
Exit site infection leading to a tunnel infection	8 (13.8%)	2 (6.7%)	0.318
Need for tube removal	7 (12.1%)	3 (10%)	0.772

How to maintain and grow a successful and sustainable home dialysis program.

Mr Christopher Swan, Miss Carol Rhodes

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Mr Christopher Swan

Biography
Christopher Swan worked at Royal Derby Hospital since 1995 within renal services I have have now worked worked in home haemodialysis for the last 15 years and have helped in the design and delivering a training program to empower and support patients to undertake haemodialysis in their own homes.

Abstract

Background: The home haemodialysis program in this unit is successful, well established and internationally recognised, with around 35% home therapies population maintained for more than 5 years.

Problem: However, we are faced with the challenge of both maintaining the prevalent population and growing the programme. We recognize our programme has been impacted by an increasing number of transplants, and a reduction in referrals from pre dialysis and shared care. Our aim is to continue to support the existing number of patients at home, reinvigorate the current HHD programme, and look at how to improve pathways to HHD from pre dialysis and shared care.

Design:

1. Nx2me connected health is an iPad-based platform that collects cycler data and transmits this to a clinical portal following each dialysis session Having such a large number at home on haemodialysis it has been invaluable that we have had the Nx2me system to remotely monitor patients at home.

2. We are working closely with the shared care team to offer a "try before you buy " option for patients considering home haemodialysis. Our unit has the advantage of having our home training area and shared care area on the main dialysis unit. Patients can go onto the Nxstage machine, which is our designated home machine, in the training bay to see what is involved in both the training and at home with this device.

3. Earlier this year we had an open day for the staff from the dialysis unit, renal ward, renal Registrars, and other members of the MDT. We have had a new influx of junior staff on the dialysis unit, and we wanted to ensure they understood the importance of home therapies. We invited them to meet the team and see the equipment, and give them confidence and knowledge to support patients who may want to choose HHD as an option and consider shared care. We plan to do a similar open day targeting patients, both pre and in centre in the New Year.

4.We have also liaised with our pre dialysis lead, and shared care lead, to try and improve the pathway from pre dialysis and the incentre dialysis population. We have arranged to start to offer more information on HHD to patients attending the pre dialysis sessions to encourage them to think about home at an early stage and gain a better understanding of what is involved.

Findings: Remote monitoring using the Nx2Me portal has allowed us to monitor a large population, covering a wide geographical area with minimal staffing numbers. We can see real time data which has allowed us to monitor and support patient adherence whilst also helping them feel more confident at home.

Feedback from the open day was positive and has given staff a renewed interest and confidence in home therapies, allowing sharing of knowledge with the wider dialysis patient population. We await further feedback from the patient focused open day and pre dialysis information sessions planned for the forthcoming months.

Conclusion: As a unit our program has grown and evolved. We continue to develop our program and embrace new technologies to help and encourage more patients to dialyse at home. We recognise the need to frequently engage in both staff and patient information sessions to ensure HHD is considered as an optimal treatment option.

A multidisciplinary team approach in utilising drug levels to guide the management of peritoneal dialysis-associated peritonitis

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Biography
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Abstract

Background: Bacterial peritonitis is a complication of peritoneal dialysis (PD), which can result in significant morbidity and, more rarely, mortality. Timely antibiotic treatment is crucial in its management. Our Hospital PD peritonitis treatment guidelines were modified in 2021, introducing measurements of vancomycin level on day 3 and gentamicin level on day 14 of antibiotic treatment to guide drug dosing. Drug levels were monitored, and dosing was tailored by a multi-disciplinary team (MDT) approach.

Aim: To evaluate the utilisation of drug level measurements and association with clinical outcomes in the management of PD peritonitis by an MDT approach.

Methods: This is a single-centre retrospective observational study in which data was collected from electronic patient records. Comparisons were made between the antibiotic management of PD peritonitis cases reported in 2019 (group 1: 63 patients) and 2022 (group 2: 48 patients). Drug levels were performed as per guidelines by the community PD team and dosing was planned by discussion with Nephrologist and Microbiologist. Data relating to patient demographic and clinical status, management and outcomes were collected. Data were analysed using SPSS version 26.

Results: The peritonitis rate in 2019 was 0.41 episodes per patient-year, whilst it was 0.42 episodes per patient-year in 2022. The median age of our cohort was 62 years, and the groups were predominately male (67%) and of white ethnicity (85%). Gram-positive organisms (50%) were most frequently detected, in which coagulase-negative staphylococcus was the most common organism **(Figure 1)**. Group 2 patients had a longer time interval between PD catheter insertion and their episode of peritonitis (29 vs 14 months, p= 0.006). The cumulative dose of vancomycin received by group 2 patients was significantly higher (4 vs 3; p<0.001), with a median time interval between the first dose of vancomycin and subsequent doses being shorter (4 vs 5.5; p<0.05). Although 101 patients (91%) received their first dose of gentamycin, only 27 received a second or subsequent dose. 62 patients (56%) received ciprofloxacin. There were no significant differences observed between the groups regarding overall clinical outcomes **(Table 1)**.

Conclusion: Dosing of drugs based on levels was successfully managed by an MDT approach. Though treatment-related clinical outcomes remain unchanged, the introduction of a drug level-based dosing management strategy highlighted the indication for increasing dosing requirements to keep vancomycin within therapeutic range in patients receiving treatment for PD peritonitis.

Table 1. Demographic, clinical characteristics and outcomes of PD peritonitis

Variable	Group 1 (63)	Group 2 (48)	P-value
Age	64 (24-85)	61 (20-87)	0.356
Gender, Male	40 (63.5)	34 (70.8)	0.416
Ethnicity, White	50 (79.4)	44 (91.7)	0.765
PD modality, APD	46 (73)	30 (62.5)	0.237
Time between PD tube insertion and peritonitis, months	14 (3.5-35)	29 (13.5-41.6)	**0.006**
Vancomycin dosing			
Doses of vancomycin	3 (2-3)	4 (2-4)	**<0.001**
Time between first and second dose, days	5 (4-5.5)	4 (4-5)	0.090
Time between second and third dose, days	5 (4-5.5)	4 (4-5.5)	**0.038**
Time between third and fourth dose, days	7 (5.5-7)	4 (4-5)	**<0.001**
Outcomes			
Medical cure	33 (52.4)	27 (56.3)	0.685
Refractory peritonitis	11 (17.5)	8 (16.7)	0.912
Recurrent peritonitis	7 (11.1)	3 (6.3)	0.376
Relapse peritonitis	7 (11.1)	7 (14.6)	0.585
Repeat peritonitis	6 (9.5)	3 (6.3)	0.531
Need for tube removal	12 (19)	7 (14.6)	0.487
Fungal growth	2 (3.2)	0 (0)	0.213
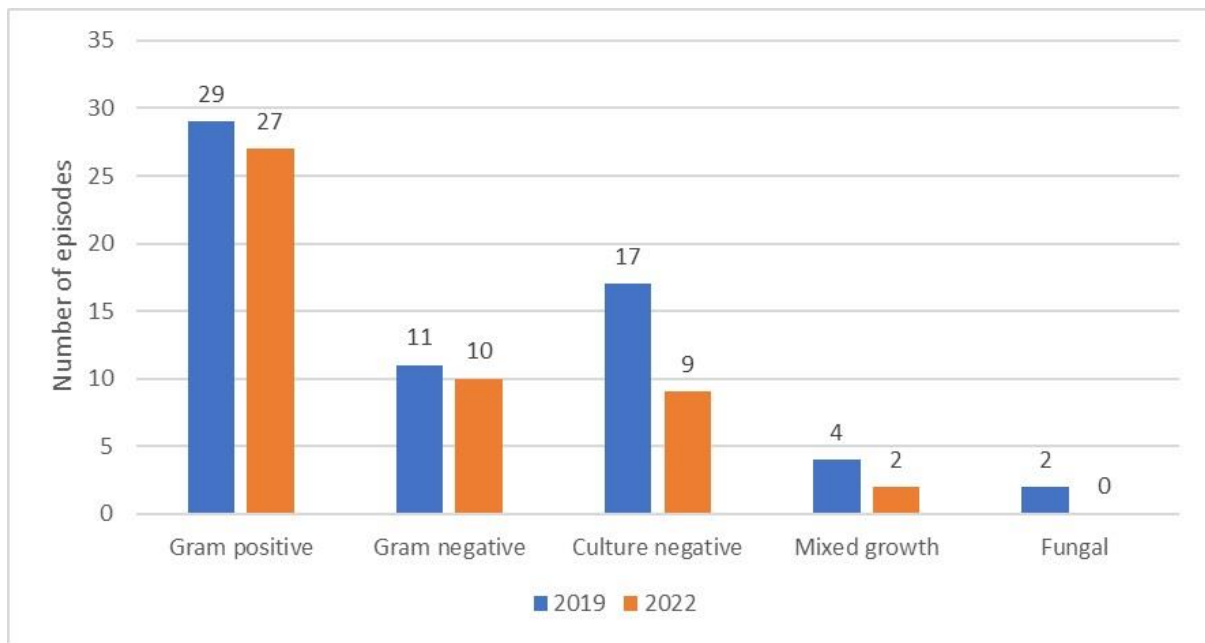
Figure 1. Distribution of organisms causing PD peritonitis

Poster number: 041

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"Predict-PD": A Machine Learning Tool to Predict Patient Survival in Peritoneal Dialysis Patients

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Biography
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Abstract

Introduction: With the rising prevalence of chronic kidney disease (CKD), particularly among the elderly, the need for effective renal replacement therapy has become increasingly crucial. Peritoneal dialysis (PD), recognized as a gentler alternative to haemodialysis, offers advantages in cognitive preservation and overall quality of life. Patient survival on PD, a tangible outcome measure, gains particular importance, especially in an aging demographic confronting end-stage kidney disease. Predicting survival thus becomes vital in facilitating individualized treatment planning and has implications on resource allocation and patient counseling.

Methodology: Our study analysed data from the UK Renal Registry and included 22,711 incident dialysis patients choosing PD between 2007 and 2022.
Our objective was to employ Artificial Intelligence (AI) algorithms in developing an advanced risk stratification indicator with high predictive capabilities, specifically tailored for use in the United Kingdom's transplant selection procedure. We conducted experiments using three distinct machine learning models and evaluated their performance in terms of calibration and discrimination, utilizing metrics such as the integrated Brier score (IBS) and Harrell's concordance index. We assessed the potential clinical utility using decision curve analysis.

Results: The XGBoost model demonstrated excellent predictive efficacy for patient survival, with a concordance of 0.78. Further scrutiny revealed AUC values at 1 year (0.81), 3 years (0.78),and 5 years (0.77). The integrated Brier score, a comprehensive measure of predictive accuracy, was 0.09. There was no statistical difference between the actual and predicted survival probabilities (P=0.74). Decision curve analysis accentuated the model's clinical applicability.

Conclusion: This study illustrates the potential of machine learning in prognosticating patient survival in PD, offering a pathway towards individualized patient-centric management in nephrology. The findings advocate for the integration of data-driven methodologies in clinical decision-making, paving the way for enhanced personalized care in CKD management and can serve as a guide for future research.
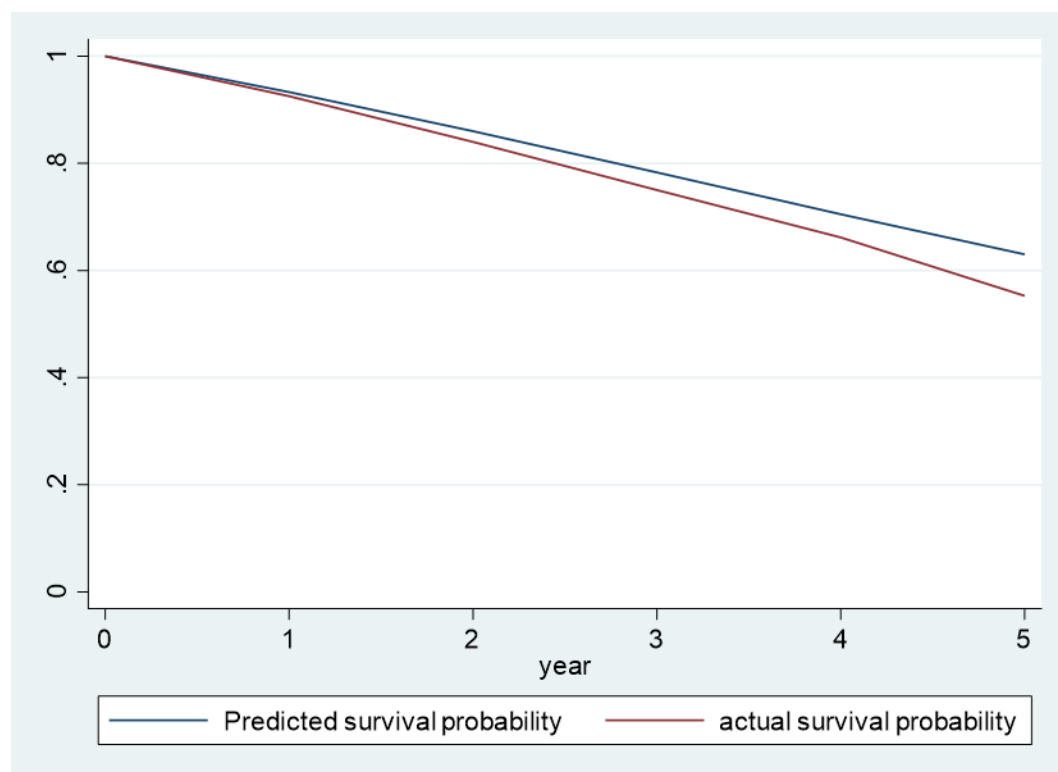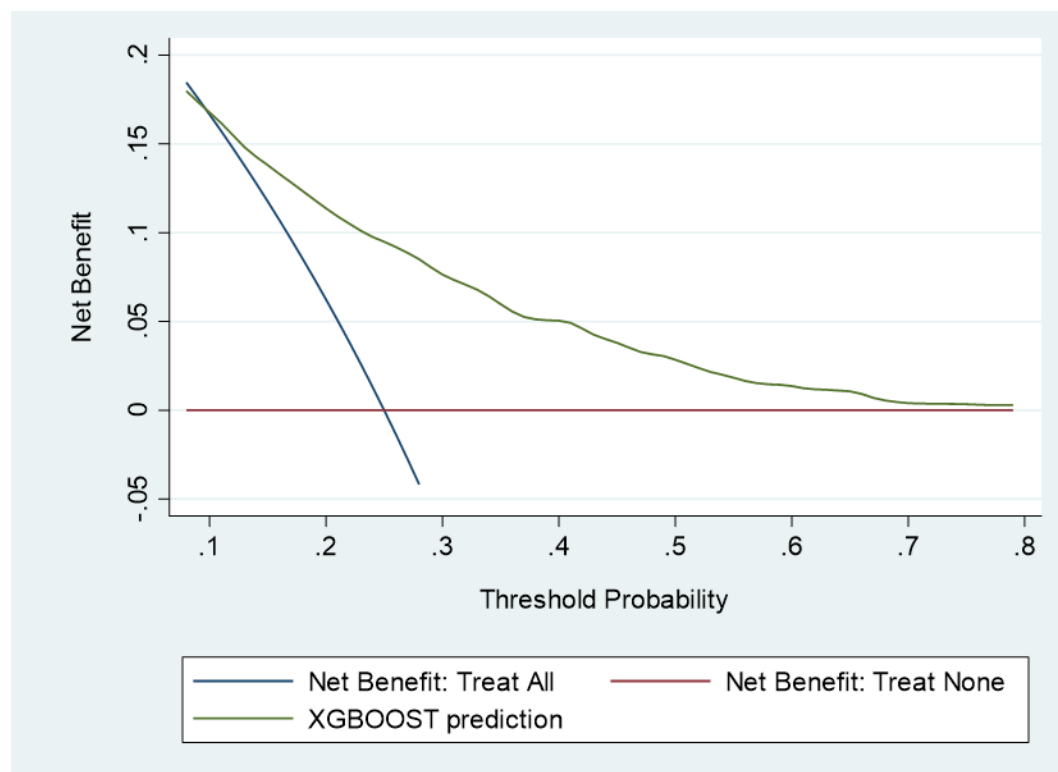
Poster number: 042

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Remote Telecare and Sharesource– a solution to avoid early dropout in peritoneal dialysis?

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Biography
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Abstract

Introduction: In the UK, 5.6% of patients requiring renal replacement therapy are on peritoneal dialysis (PD). This number varies between 1.5 to 12.7% depending on the region (UKRR 2023). The incidence of PD discontinuation is highest in the first 3 months of initiation and remains stable for the following 3 years (Piarulli, et al., 2023). The most common reason for switch from PD to haemodialysis (HD) in the first 6 months is catheter dysfunction (Bechade, et al., 2014). Baxter Telecare is a novel remote telephone support service for those on automated peritoneal dialysis (APD), where treatment and alarms are monitored by a trained registered nurse employed by Baxter. Used alongside usual Sharesource monitoring, it aims to provides pre-emptive support to patients by prompting action in conjunction with the patients' usual clinician. It has resulted in reduction in 90-day dropout rate in the US (Todd, et al., 2021) but has never been used in the UK. We aimed to pilot the service and evaluate its effect on early dropout rate at our centre.

Method: All patients started on APD with Baxter over a 9-month period were enrolled on to the pilot. Those on assisted PD were excluded. Patients were given a questionnaire to complete during training, to assess understanding, confidence and level of support. Patients who were monitored remotely had information on APD alarms, Telecare interactions and treatment changes recorded.

Results: 13 patients were enrolled during the pilot period, 10 were male (71%) and the median age was 50 years. A total of 32 cases were opened and interactions prompted by the Baxter team. Telecare picked up 20 (63%) new issues. In 38% of cases highlighted by the Telecare team, the issue was already acknowledged by the clinical team. 1 (8%) patient dropped out of APD within 90 days of initiation during the study period. Prior to the introduction of Telecare, 185 patients started on PD between 2018 and 2022. The average 90-day dropout rate over those 5 years was 11%.

Discussion: When questioned, patients reported a good understanding regarding PD treatment and generally felt supported at time of initiation. 69% of patient rated 7 or more when asked if they are concerned with running into problems or alarms on PD. Although this may begin to decrease after a period on treatment, a remote monitoring support service may also help to reduce stress at

initiation. No conclusions can be made as yet regarding the effect of Telecare on treatment duration and dropout rates, but we plan to continue enrolling more patients over a longer period, to better assess the effect on patient PD retention. Telecare has however helped with patient retention in our centre in these early stages and has alleviated an already stretched NHS nursing PD resource.
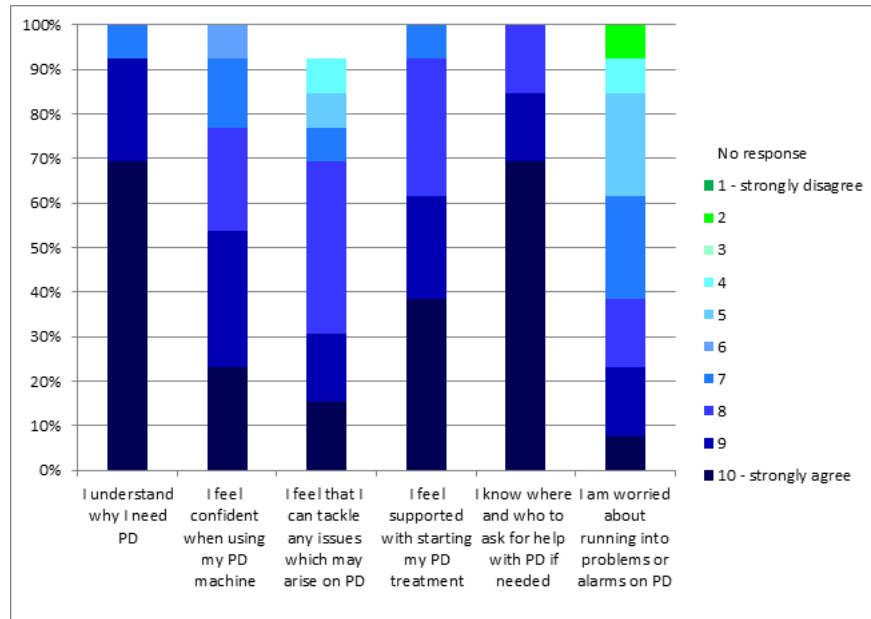
Figure 1 – patient questionnaire responses regarding understanding, confidence and level of support felt prior to the initiation of APD (*n*=13)

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Investigating the impact of frailty status and social deprivation on outcomes in patients receiving peritoneal dialysis

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Abstract

Background: Frailty is a complex, age-associated multi-dimensional syndrome and an established predictor of adverse health outcomes. Several studies have reported the association between social deprivation and frailty in the general population. Currently, there is a paucity of data which evaluated the impact of frailty status and social deprivation on outcomes in patients receiving peritoneal dialysis (PD).

Aim: Our study aimed to evaluate the associations between frailty status, social deprivation and outcomes of patients receiving PD.

Methods: This is a single-centre, cross-sectional observational study conducted for 88 PD patients under follow-up at Salford Royal Hospital Renal Unit between April 2022 and May 2023. Baseline clinical characteristics were gathered from electronic patient records. All patients were followed up until December 2023. Patients were subdivided into two groups based on the Rockwood Clinical Frailty Scale (CFS) - 'Frail' (CFS≥5) or 'Not Frail' (CFS<5). Baseline characteristics between these groups were

compared. Social deprivation was calculated using the index of multiple deprivation (IMD) 2019 scores using postcodes. Binary logistic regression analysis was performed to identify risk factors that are predictors of mortality, and a Kaplan-Meier graph was constructed to aid the visualisation of survival probability.

Results: Median age was 56 years (range 20-84) overall with a predominance of males (59.1%) and those of white ethnicity (69.3%), in which these characteristics were statistically similar between the two groups. A significantly higher proportion of patients in the 'frail' group had a history of diabetes (61 vs 25%; p=0.002), ischaemic heart disease (39 vs 12%; p=0.005), myocardial infarction (30 vs 5%; p=0.001), and cerebrovascular accidents (30.4 vs 4.6%; p=0.001). The median number of co-morbidities (8 vs 6; p=0.004) and number of medications prescribed (14 vs 11; p=0.009) appeared significantly higher amongst patients in the 'frail' group (**Table 1**). 78% of the frail patients were from the lower deprivation areas (IMD quintiles </=2). **(Figure 1).** 15 patients (17%) died, with a median follow-up of 15 months. Amongst those who died, a higher proportion were from the 'frail' group (39.1 vs 9.2%; p=0.001). Binary logistic regression analysis showed older age, a higher CFS score and having a greater number of co-morbidities as significant predictors of mortality (**Table 2**). Kaplan-Meier analysis demonstrated survival probability was lower in patients with higher CFS scores. (Log-Rank p=0.005) (**Figure 2**).

Conclusion: Being older, frailer and having more co-morbidities were found to be significant predictors of mortality in our patient cohort. Frailty was found to be observed more commonly in patients living in socially deprived areas. A multi-disciplinary, individualised management approach is warranted for older PD patients living with frailty to promote shared decision-making and optimisation of care.

Table 1: Baseline characteristics and clinical outcomes of the patient cohort

Characteristics	Total number (88)	Frail CFS >/=5 (23)	Not-frail CFS<5 (65)	p-Value
Age	56 (42-65)	62 (46-69)	54 (44-64)	0.268
Gender, Male	52 (59.1%)	14 (60.9%)	38 (58.9%)	0.840
Diabetes mellitus	30 (34.1%)	14 (60.9%)	16 (24.6%)	**0.002**
Ischaemic heart disease	17 (19.3%)	9 (39.1%)	8 (12.3%)	**0.005**
Myocardial Infarction	10 (11.4%)	7 (30.4%)	3 (4.6%)	**0.001**
Congestive Heart Failure	11 (12.5%)	5 (21.7%)	6 (9.2%)	0.119
Cerebrovascular accident	10 (11.4%)	7 (30.4%)	3 (4.6%)	**0.001**
Number of co-morbidities	6 (5-8)	8 (6-12)	6 (5-8)	**0.004**
Number of medications	12 (9-15)	14 (12-17)	11 (9-14)	**0.009**
Number of patients who had peritonitis in 2022	22 (25%)	10 (43.5%)	12 (18.5%)	**0.017**
Outcomes				
All-cause mortality	15 (17%)	9 (39.1%)	6 (9.2%)	**0.001**
Change of modality to haemodialysis	12 (13.6%)	2 (8.7%)	10 (15.4%)	0.422
Follow-up time (months)	15 (9-15.5)	15 (8.5-15)	15 (13-15.5)	0.119

Continuous variables are expressed as median (interquartile range) and p-value by Mann-Whitney U test. Categorical variables are expressed as numbers (percentage) and p-value by Chi-square test.

Table 2: Predictors of mortality from binary logistic regression analysis

Characteristics	Univariable analysis		Multivariable analysis	
	OR (95% CI)	p-Value		
Frailty	7.3 (1.62-32.21)	**0.009**	2.44 (0.37-15.7)	0.348
Age	1.08 (1.01-1.14)	**0.011**	1.08 (1.09-1.17)	**0.029**
Ischaemic heart disease	6.97 (1.63-29.79)	**0.009**		
Cerebrovascular accident	5.1 (1.05-25.18)	**0.043**		
Number of co-morbidities	1.44 (1.13-1.82)	**0.002**	1.38 (1.02-1.86)	**0.034**
Number of medications	1.34 (1.13-1.61)	**0.002**		

Figure-1 Distribution of frail patients across the quintiles of the index of multiple deprivation
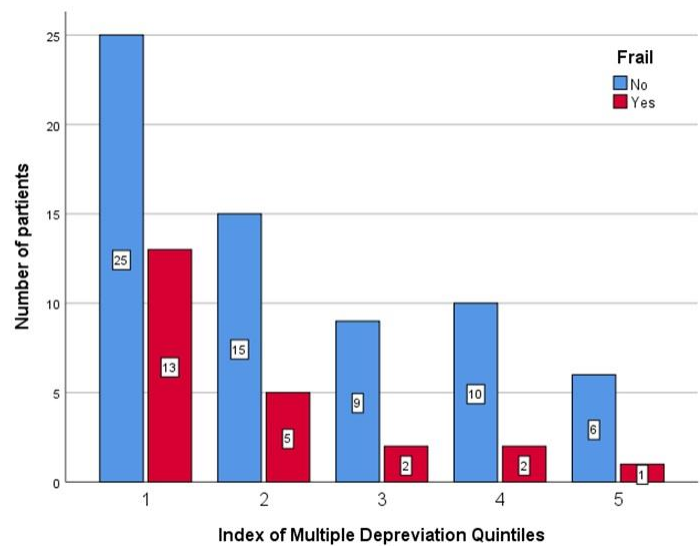
Figure 2: Kaplan-Meier analysis of the 'Frail' and 'Not Frail' groups
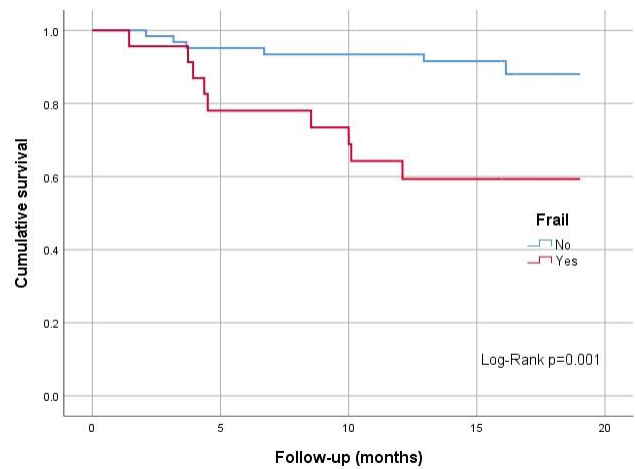
Poster number: 044

Submission number: 181

The relationship between residual kidney function and cognitive function in adults receiving peritoneal dialysis: a systematic review and meta-analysis

Dr Osasuyi Iyasere[1,2], Dr Hadeel Ahmed[1], Dr Fateh Chattah[1], Dr Khalid Abd elMagid[1]

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Dr Osasuyi Iyasere

Biography
Consultant nephrologist and honorary senior lecturer

Abstract

Introduction: Cognitive impairment is common in adults receiving peritoneal dialysis (PD) and has been linked to adverse outcomes. Residual kidney function (RKF) is a key determinant of clinical outcomes in dialysis patients but the evidence on whether it affects cognitive outcomes is unclear. The aim of this review was to evaluate the effect of RKF on cognitive function in adults receiving PD.

Methods: Studies up until April 30th, 2023, were identified from databases including MEDLINE and Embase, using a pre-specified protocol (PROSPERO – CRD42023403924). Studies evaluating cognitive function in adults on PD were included. Data pertaining to RKF and cognitive function were extracted. A meta- analysis of the eligible studies was conducted, using random effect models by the inverse variance approach. Risk of bias assessments were undertaken using the Cochrane Risk of Bias In Non-randomized Studies – of Exposure (ROBINS-E) tool.

Results: 15 observational studies (9 cohort; 6 cross-sectional) were included, after reviewing 2622 abstracts. RKF was not a significant risk factor for cognitive impairment [pooled OR = 0.98(0.90 -1.06), p = 0.96]. It did not correlate with cognitive scores [pooled r = - 0.005 (- 0.07 – 0.06), p = 0.88] and did not differ between those with or without cognitive impairment [standardized mean difference = - 0.01(- 0.09 – 0.07), p =1.00)]. One study reported a positive correlation between cognitive function and 24 hour urine output from 1500 mls/day and above. Another retrospective cohort study found a significant association between at RKF and the risk of clinician reported cognitive impairment. The evidence was graded to be of low quality, with a moderate to high risk of bias.

Discussion: RKF may not be associated with cognitive outcomes in adult patients receiving PD. However, the findings should be cautiously interpreted due to the low quality of evidence. Studies that evaluate longitudinal trends in RKF alongside cognitive measures, are needed to address the limitations identified.

Poster number: 045

Submission number: 244

A unit wide approach to increasing the uptake of home therapies in an established kidney unit

Mrs Jayne Woodhouse, Ms Sharon Stacey

Oxford Kidney Unit, Oxford

Mrs Jayne Woodhouse

Biography

Jayne has had an extensive career in renal nursing. Her current role is as an Advanced Nurse Practitioner within a busy Peritoneal Dialysis Unit. She demonstrates leadership and clinical expertise as well as providing advanced nurse education, evidence-based practice, and service development. She also cochairs the PD forum, a private Facebook group where PD nurses can share information and ask questions. She also is a member of the ISPD Nursing Liaison Committee. She is committed to leading a progressive and evidenced based service, innovating, and sustaining change and importantly providing a good patient experience. She leads by example and promotes learning whenever opportunities present themselves.

Abstract

Introduction: Home therapies are increasingly being seen as the first therapy for people with advanced kidney disease, providing patients with flexibility, skills and increased confidence and compliance. Home therapies may also offer cost effectiveness as there is less travel to hospital.

Methods: In the Oxford Kidney Unit, a multiprofessional working party evaluated our previous home therapies approach in line with GIRTH[1]. A KQuIP Quality Improvement upskilling project was planned and led by key individuals within the unit.

Regular meetings were held, providing the team members with the skills and support to lead this project forward. Specific areas were audited and evaluated and further sub working groups developed. Positive changes included re-evaluating the low clearance referral pathway, development of patient information and posters, providing a buddy system for patients. Within peritoneal dialysis regular patient gatherings were implemented. In the haemodialysis units there was much more focus on shared care. The QI project meant that the projected was sustained over a period of 2 years.

Audit was vital to chart the progress or difficulties and if we could overcome them.

Evaluation: Over the last 2 years, our home dialysis proportion have increased from 15.3% to 18.9 % due to the growth in PD numbers (60 to 93).

Patients on a home therapy need to ensure that they are supported and have any issues or problems resolved in a timely manner. Therefore, it was vital to ensure that patients were able to share and meet other people experiencing the same therapy. Our social gatherings have been an extremely positive outcome.

Discussion: The national GIRFT target for home dialysis is 20% so we continue to work on increasing the home therapy numbers.

The development of the project has been sustained by the team mainly due to the QI project, this has invigorated and uplifted staff, so they feel supported and believe in the project.

References

Website: https://gettingitrightfirsttime.co.uk

Poster number: 046

Submission number: 253

Investigating the inequality of Peritoneal Dialysis initiation by Ethnicity and Socio-Economic Status

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[2]NHS England, London.
[3]NIHR Clinical Research Facility, Exeter

Aisha Bello

Biography
Aisha Bello is a biostatistician with 2years experience at the UK Renal Registry. She holds an MSc in Medical Statistics from the University of Leicester. Aisha's keen interest in guiding decision-making in the health sector inspired her to pursue a career in biostatistics. She enjoys analysing data to provide insights for public health.

Abstract

Introduction: Home dialysis offers patients more control and flexibility, yet it is under-utilized and declining in developed countries. Globally, only 11% of end stage renal failure (ESRF) patients receive peritoneal dialysis (PD). Incidence of PD is low with uncertain variation between ethnic and deprivation groups. Previous studies found non-white and more deprived groups were less likely to start dialysis on PD. However, an audit by the Renal Service Transformation Programme (RSTP) Health Equity Group did not find any difference in PD start between ethnic groups in 2017-2019 incidence cohort, which contradicts the common conception that PD start is lower in non-white groups. Therefore, our study aims to investigate the trends of incident PD by ethnicity, age, sex, and socio-economic deprivation in UK Renal Registry (UKRR) data.

Method: The study is a retrospective cohort study that includes adult and paediatric patients starting dialysis for ESRF in England and Wales between 2008-2021. The outcome of the study is the proportion of dialysis patients starting on PD, and covariates included were age, sex, race (White, Asian, Black, other ethnicities), and index of multiple deprivation quintile (IMD).

Logistic regression was used to explore time trends in PD initiation by ethnicity, age, sex, and IMD.

Result: Overall, 87,636 patients were included. Of these patients, only 19,548 (22.3%) initiated dialysis on PD. PD initiation varied between groups of patient demographics. Our time-trend analysis showed that non-white ethnicities witnessed an increasing trend over periods while whites experienced a stable trend. In the last study period, there was a dramatic growth in the rates of incidence PD for Asians (See FIG.1a). The odds of incidence PD rate increased by 1.034 (95% C.I: 1.023, 1.046) and 1.037 (95% C.I: 1.021, 1.053) for Asians and Blacks respectively, with increasing year of treatment. P-value for ethnicity-time interaction p<.0001. The proportion of PD uptake was relatively stable by age groups over time.

However, those between 75-85 years of age stood in contrast to other age groups, as there was a gradual increase of PD initiation over periods. (see FIG.1b). P-value for age-time interaction p<.0001. Although PD rates varied by sex and levels of deprivation, there was no significant variation in PD trends (see FIG.1c and See FIG.1d respectively).

Discussion: There was a change in trend of PD initiation between groups of patient's baseline characteristics. The change was more evident among ethnic groups, with an increased PD uptake for non-whites in the recent years. The variation between groups could be driven by centre-level characteristics and factors such as lead clinicians'/medical teams' attitude for peritoneal dialysis, which may be projected to patients through pre-dialysis education and assisted PD programs. Therefore, an in-depth analysis will be performed to investigate factors associated with starting dialysis on PD. We would examine the incidence of PD adjusted for baseline characteristics to investigate whether PD is equitable between ethnic groups and then explore centre-level variation in PD initiation. This will help address variation and issues of home dialysis access among ethnic and more deprived groups.

FIG:1: The percentage of incidence patients who started dialysis on PD between 2008-2021 by a) ethnicity b) age group c) deprivation group d) sex
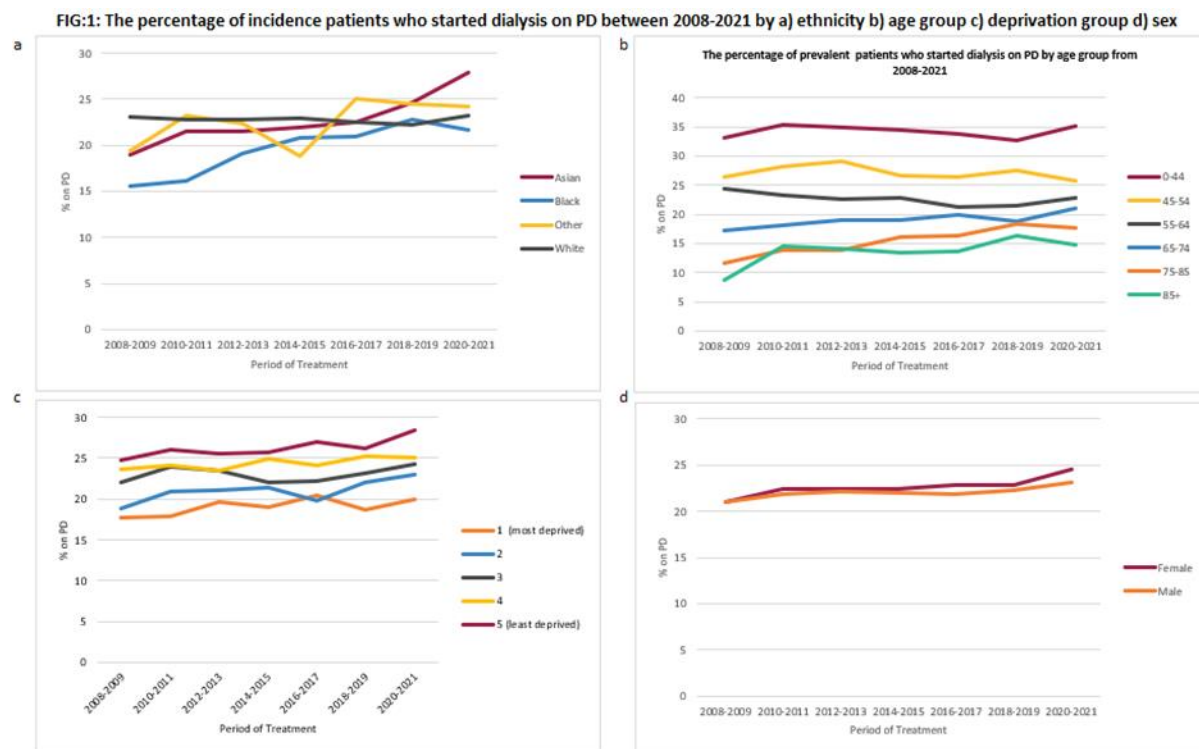
Poster number: 047

Submission number: 628

Harnessing the power of the collective to drive changes in home dialysis programmes nationally

Mrs Georgina Hamill[1], Mrs Kay Elson[1], Mrs Leeanne Lockley[1], Mrs Catherine Stannard[1], Ms Ranjit Klare[1], Mrs Julie Slevin[1], Mr Udaya Udayaraj[2]

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[2]Oxford University Hospital, Oxford

Mrs Georgina Hamill

Biography
I have been working on national change programmes within the NHS for the last 10 years. I co-led the national network programme at NHS Improving Quality from 2013, a career highlight was speaking at the International Network Symposium in Edmonton, Canada and contributing to the International white paper. I joined the QSIR team in 2020 which involved delivering quality improvement training nationally. Currently on secondment to the UK Kidney Association, I am working on DAYLife, the national home therapies programme. I thrive when working with people creating a positive and inclusive work environment to develop impactful programmes of work. Amidst the chaos of deadlines and deliverables, I hope to create a calm work environment which fosters collaboration and a commitment to learning and improvement.

Abstract

Background: "Working in co-production isn't merely about sharing the workload; it's about sharing the vision, the responsibility, and the transformative power to reshape systems from within."

Introduction: Dialysis at Yours: Life Fulfilled (DAYLife) is a partnership between The UK Kidney Association (UKKA), Kidney Care UK and Fresenius Medical. Together we are committed to working in collaboration with stakeholders to initiate and sustain transformative programmes (locally, regionally and nationally) to support the renal community in delivering home dialysis to exceed the 20% Getting it right first time (GIRFT) target.

In March 2024, stakeholders from across the renal community, including patients, come together at a home dialysis summit as equal partners to design, deliver, and support interventions to drive forward home dialysis.

Methods: Building on a Patient Virtual Event and a Leadership Virtual Event held in 2023, which explored the barriers and challenges to home dialysis from both a patient perspective and health care professional perspective, DAYLIFE designed and facilitated a face-to-face home dialysis summit, in partnership with the Inter-CEPT study investigators and the UKKA Dialysis Specialists interest Group. The morning consisted of several presentations from the Renal Service Transformational Programme (RSTP),

the Inter-CEPT study, NHS England, and a Question-and-Answer panel with representation from the kidney charities.

The afternoon consisted of 4 breakout sessions which were selected as they resonated with the needs identified from both the patient and leadership events.

- Nurse home dialysis workforce planning.
- Nurse workforce training on shared decision making.
- Medical workforce training on home dialysis.
- Leadership, engagement and quality improvement (QI) around home dialysis.

Mentimeter was used to gather participants views and helped facilitate discussions around key challenges and potential solutions. By working in small groups, we were able to pool together diverse expertise and perspectives. The sessions were facilitated to enable the generation of novel solutions to complex problems.

Results: We were at capacity for registrations (n= 195) and had representation from a wide variety of multidisciplinary team professionals and other key stakeholders. 10 patients who had been involved in either DAYLife or Inter-CEPT study attended the event along with representations from UK kidney charities. Table 1 shows the breakdown of attendees. Each of the afternoon breakout sessions generated a number of initiatives that we, along with our stakeholders will take forward.

Eg, the medical workforce training session participants considered current provisions for home dialysis training to be inadequate and put forward several recommendations to address the gaps. Majority of the participants in the QI training session reported having not been involved in home dialysis improvement projects and have not received adequate QI training to deliver the improvement. There was overwhelming support to provide structured QI training to all renal centres.

Attendee Type	Number of Attendees
Consultant	19
Nurse/MPT	96
Trainee	11
Patient	10
Management	4
Industry	10
Charity	4
	154 (plus facilitators)

Conclusion: Embracing collaboration and co-production as a guiding principle, DAYLIfe will continue to work in partnership with MDT and key stakeholders to leverage resources and expand our reach and effectiveness. Through our networks and partnerships we will strive to facilitate the dissemination of best practice to drive forward home dialysis. This will be done through,

- Creating an interactive knowledge hub to connect, learn and share.
- Increase regional QI leadership and capability through QI training days and mentorship
- Further f2f and virtual events

Poster number: 048

Submission number: 500

What is need to Improve PD access pathways across a regional network?

Dr Bhrigu Raj Sood[1,2], Dr Richard Corbett[3], Ms Elaine BOWES[4], Ms Katie DURMAN[5], Ms Mariza PROCOPIO[2], Ms Nicola CUNNINGHAM[2]

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Dr Bhrigu Raj Sood

Biography
Consultant Nephrologist and Lead for home therapies at St Helier Hospital, Carshalton . Quality lead for peritoneal dialysis access for London Kidney Network. Lead for ISN centre for Interventional Nephrology.

Abstract

Introduction: Timely access to a well-functioning peritoneal dialysis (PD) catheter is critical to the success of any PD programme. There are significant variations between units, both in primary insertion of catheters as well as resolution of catheter related problems. As part of the London Kidney Network (LKN) Dialysis at Home work stream, this work set out to understand differences in PD access pathways across renal units in London and Surrey and to seek consensus on key performance indicators of an optimised pathway.

Methods: A questionnaire was developed with input from key stakeholders and circulated across the seven renal units forming the LKN. The responses were collated with using an online survey response; descriptive statistics were derived, based upon a single response from each unit.

Results: Each year in London Approximately 500 new PD catheters are inserted (ranging from 40 to >100 catheters in individual units) and 200 rescue procedures are undertaken (ranging from 20 to 40 in each unit). Exclusively surgical pathways for both primary insertion and repositioning are used in three units while the reminder (four units) uses a hybrid pathway. In these units, 60 to 95% of procedures are delivered percutaneously.

Pathway responsiveness varied between the units. Of the five units which responded to this section, four offered urgent start to PD and whilst two indicated that interval haemodialysis was sometimes required due to delay in procedure to resolve catheter malfunction.

One unit felt that their PD access pathway was highly responsive to patient needs; five units thought that their pathway worked most of the time, whilst one unit felt that their pathway needed significant improvement to make it readily accessible and responsive.

There was a broad consensus on the indicators of an optimised PD access pathway. Most units felt that the patient should have access to planned catheter insertion within two weeks from referral, and people needing to start dialysis urgently should be able access catheter insertion within three days. For a patient with no residual function, any catheter malfunction should be resolved within 48 hours, while patients with significant residual function should be able to have restorative procedure within seven days. Units with access to a percutaneous PD catheter insertion, and percutaneous or radiological intervention to resolve catheter malfunction, were more likely to achieve these goals.

Lack of surgical time and expertise in providing PD access was identified as a challenge in poorly responsive pathways. Responders suggested that access to CEPOD list for urgent PD procedures, training of surgeons in laparoscopic procedures and development of percutaneous pathway, where not available, would improve PD access. Development of shared policy as well as quality standard to monitor PD access outcomes is desirable.

Conclusion: Units across London deliver a large number of PD procedures every year. There is a significant variation in practice. This survey identified need for improvement in PD access in most units, although challenges varied, from lack of surgical time and expertise to unavailability of percutaneous procedures. Prioritising access to peritoneal dialysis catheters is a key feature of improving the quality of care for people who choose to dialysis at home.

Poster number: 049

Submission number: 114

Optimisation and Standardisation of the PD training program.

Mrs Joanne Mason, Mr James Kelk

UHDB University Hospital Derby and Burton NHS Trust, DERBY

Mrs Joanne Mason

Biography
Joanne Mason, Band 4 PD Trainer, Derby Home Therapies Team. Jo has worked in Renal Services in Derby for 26 Years on the Haemodialysis Unit, working for the last 2.5years in the Home Therapies Team

Abstract

Introduction: Peritoneal Dialysis training and retraining is essential for achieving successful technique, the avoidance of associated infections and potential treatment failure.

Purpose: Historically this training was undertaken by the Band 6 Home Therapies CNS team however, the following issues were identified:

- New patient training undertaken by the CNS team compromised other essential nursing responsibilities e.g. PET, UKM and clinical reviews impacting patient care and resulting in low staff moral.
- New patient training was inconsistent with no standardised program.
- Annual and post peritonitis retraining was also inconsistent with no standardised program and delayed.
- Ad Hoc training by different CNS was delivered due to time restraints.

Method: In 2021 a new 1wte Band 4 'PD Patient Trainer' role was Introduced to the Home Therapies Team with the aim of delivering a consistent standardised set training programme that could adapt to the specific needs of each patient allowing the CNS team to focus on essential areas of patient care.

All new patients received a standardised training and retraining program. New patients received two 4hr sessions over 2 Days which increased to three or four sessions if required. The training is undertaken in-centre with further training sessions at home if needed. Each patient is assessed & training is adapted to their requirements.

In addition to the standardised training program these additional training aids were added: -

- In-house produced training videos on YouTube for APD & CAPD
- Timely annual and post peritonitis retraining for all Patients
- Laminate peritonitis sign and symptoms cards with phone numbers
- UV hand hygiene lamp for ANTT

- Patient feedback form post training

Results: The Band 4 trainer role released over 500 CNS hours over the first 12 months in post based on essential Training alone.

To date 100% of patient's received annual at-home retraining ensuring they maintained appropriate hand hygiene education. All received a peritonitis signs and symptoms laminate to hang on their drip stand with important Ward/PD phone numbers included.

Excellent patient feedback of positive tailored training experience.

100% of the 56 new patients trained during 2021 completed feedback forms, of these 73% expressed appreciation of tailored one to one Training in Centre. The Remaining 27% of patients did not leave any addition comments however still gave positive scores.

Patient care improved by freeing up nursing staff for UKM, PETS, Clinical reviews and face to face community care at the patient's home. In addition, it allowed nursing staff to respond to any ad hoc issues that could occur in a timely manner. Nursing staff have reported that moral has improved as they are able to provide better patient care both in-centre and at the patient's home.

After commencing the New PD Trainer Role in 2021 Peritonitis Rates significantly reduced from 0.4 to 0.2 by Dec 2021, bringing it below the target set by the ISPD Guidelines.

Conclusion: Implementation of this new role has ensured the delivery of consistent standardised PD training and retraining which has positively impacted patient care and outcomes in addition to job satisfaction for staff.

Poster number: 050

Submission number: 147

Rates of hypokalaemia and peritonitis in a single centre peritoneal dialysis population.

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Nottingham University Hospitals NHS Trust, Nottingham

Oscar Walton

Biography

Oscar Walton qualified as a dietitian in February 2022 with an MSc in Dietetics after completing a BSc in Exercise, Health and Nutrition in 2017. Oscar became a specialist renal dietitian in December 2022 after working as a rotational dietitian in an acute hospital. He is currently working in a Home Therapies team with an interest in Dietetic practice and peritoneal dialysis. Oscar has a strong interest in artificial nutrition and he recently won the best abstract at the British Association for Paternal and Enteral Nutrition conference, in 2022 and at the 2022 & 2023 British Dietetic Association research symposiums.

Abstract

Background: The International Society for Peritoneal Dialysis (ISPD) recommends the management of modifiable peritonitis risk factors including hypokalaemia [1]. A multi-country trial with 7421 peritoneal dialysis (PD) patients found 27.2% and 11.1% had an average potassium of 3.99-3.50mmol/L and <3.5mmol/L, respectively[2]. In PD populations an average potassium <3.5mmol/L was associated with a higher peritonitis risk (hazard ratio (HR) 1.15) compared to normokalaemic cohorts[2]. This association is severity-dependent, compared to normokalaemic cohorts, groups with an average potassium 3.50-3.01mmol/L and <3.00mmol/L had a higher peritonitis risk (HR 1.43 and 2.02, respectively)[3]. Peritonitis risk is related to the duration of hypokalaemia, in PD cohorts with a potassium 3.50-3.01mmol/L and <3.00mmol/L for >6-months peritonitis risk was higher (HR 1.53 and 2.28, respectively) compared to normokalaemic groups[4]. The ISPD and UK Kidney Association (UKKA) have target peritonitis rates of <0.4 cases per year and <0.5 cases per year respectively. A Peritonitis Quality Improvement Project aims for no PD centre in the UK Midlands to have a peritonitis rate >0.45 and a target rate <0.35 by October 2024[5].

We aimed to identify the prevalence of hypokalaemia and peritonitis in a single-centre PD population.

Methods: Between 01/06/2022 and 01/08/2023 the total number of patients on PD and the number of patients on PD with a potassium <4mmol/L were collated. Centre peritonitis reports and case root cause analysis data were used to identify peritonitis prevalence. The PD population was divided into cohorts; those with a 3-month average potassium >4mmol/L, those with potassium 3.99-3.51mmol/L (Moderately Low Potassium (MLK)) and <3.50mmol/L (Low Potassium (LK)).

Results: During the time frame, the mean PD population was 98 (SD). 19 (11.1%) had MLK and 4 (4.1%) had LK. Figure 1 shows the primary PD episodes per patient year and figure 2 shows the recurrent, relapsing and refractory peritonitis episodes per patient-year.

Figure 1: Rates of primary peritonitis episodes incidents per patient year

Figure 2: Rate of all peritonitis episodes per patient year (including recurrent, relapsing and repeat)

■ IPSD target peritonitis rate per patient year[1]
◆ MLK cohort rates
● Overall centre rates
▲ LK cohort rates
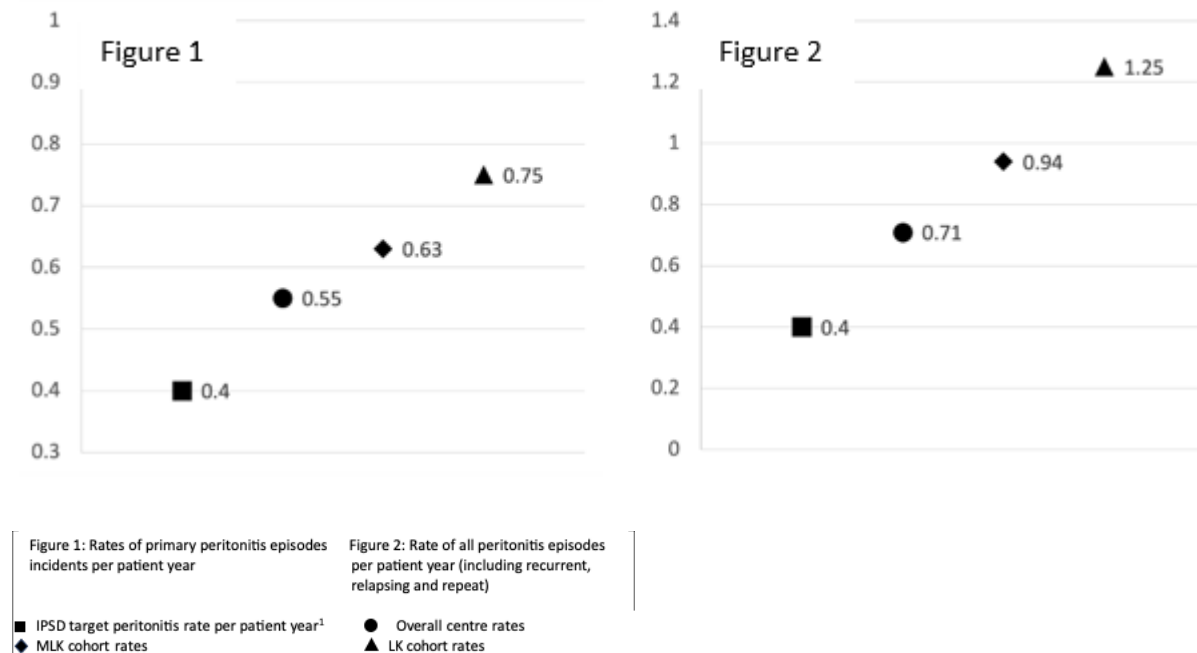
Discussion: Peritonitis episode rates at our centre are above ISPD and UKKA targets[1,5]. The prevalence of primary and non-primary peritonitis episodes increased in a linear manner the lower the average serum potassium. The rates of peritonitis episodes were higher than average centre rates in the MLK cohort and highest in the LK cohort, this aligns with current evidence. A novel finding was that those with hypokalaemia were more susceptible to recurrent, relapsing or repeat peritonitis episodes than the normokalaemic and MLK groups. However, the small sample sizes limits the transferability of these findings. A randomized controlled trial found that maintaining serum potassium between 4-5mmol/L via oral potassium supplementation significantly reduced the risk of peritonitis (HR 0.48 CI 95%) compared to reactively replacing potassium when <3.5mmol/L[6-7].

Our findings support existing data that hypokalaemia is associated with a higher risk of peritonitis. A novel finding of this audit was that those with hypokalaemia were more susceptible to relapsing refractory and recurrent PD episodes. Based on limited randomized control trial evidence units could consider oral potassium supplementation and high potassium dietary interventions to support peritonitis risk management.

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Poster number: 051

Submission number: 197

Evaluation of novel multi-disciplinary team approaches to support social isolation and treatment burden in patients receiving home dialysis- A qualitative study.

Mrs Joanne Collier, Mrs Joanne Martin, Mrs Anna Ely, Mrs Paula Tooby, Prof Helen Hurst, Dr Dimitrios Poulikakos, Dr Rajkumar Chinnadurai, Dr David Lewis

Department of Renal Medicine, Salford Care organisation, Northern care Alliance NHS Foundation Trust, Salford, UK

Mrs Joanne Collier

Biography
Community Peritoneal Dialysis Specialist Nurse at Salford Care Organisation, Greater Manchester.

Abstract

Introduction: The benefits of a home dialysis treatment are well versed, and the home-first approach is widespread. The demographics of patients on peritoneal dialysis (PD) have changed over the years, with increasing frailty and high levels of co-morbidity leading to complex and challenging issues for patients, families, and healthcare providers. Home dialysis is associated with a burden for certain patients affecting their quality of life on PD, such as fear of social isolation, anxiety, perceived financial burden, carer burnout and fatigue. These factors have worsened since the COVID-19 pandemic. Strategies suggested to overcome these include meeting other patients on home therapies and providing adequate resources[1]. This study aims to evaluate the novel multi-disciplinary approaches that we introduced to support patients and their families.

Methods: Our PD service developed novel methods of support and resources for patients on PD and caregivers to address the burden of home therapies. We have rolled out a bi-annual newsletter since 2018, updating patients and families on how to live well on PD using individual patient stories (hints and tips), clinical pictures (e.g. exit site care) and team updates. We also introduced patient support afternoons (March & November 2023) in informal café style meetings where patients, relatives, and guests have access to members of the multi-disciplinary team (dietician, pharmacist, transplant team, vascular access team, financial support team, charities) and other patients on home therapies. The evaluation was conducted using a structured feedback form with a few questions on a five-point Likert scale rating (excellent, very good, good, acceptable, and poor) with a few open-ended questions.

Results: Of the 11 responses received for the newsletter, 100% reported that the presentation in the newsletter was clear and informative. The majority (88%) felt the information was useful and all would want to continue with this newsletter. One positive response cited, "Support gained from reading others' experiences". Other specific feedback for future issues included; "more specific info around holidays", "more information on diet and alcohol intake", "to share information in other formats" e.g. e-mail.

We had 23 respondents for the patient support afternoons of which 13 were male, with a median age of 60 years, and the median duration of PD of the sample being 2.7 years. Overall, there was a positive rating for the venue, time, relevance of the session and the topics presented. 95% of attendees stated they would attend again and the number of returning attendees has increased. A majority requested for the sessions to be longer in duration. Meeting other patients (peers) on home therapies and sharing experiences was a strong theme throughout the evaluations (Table 1).

Conclusion: It was clear from the evaluation that both the newsletter and patient support afternoons were well received by patients. These events can help provide peer support with opportunities for education and information sharing. Ongoing events with an extended focus on families and patients from wider ethnic backgrounds if warranted to deliver personalized care.

Table-1. Evaluation of the patient support afternoon feedback form

	Positive	Excellent	Very good	Good	Acceptable
Time and venue	100%	21%	34%	39%	0.04%
Presentation and Topics	100%	30%	39%	30%	0%
Relevance of sessions	100%	39%	34%	26%	0%
Most informative sessions	Holiday information Financial advice and benefits claim Charities Transplant Pharmacists Other patients' experiences.				
Sessions would have liked	More holiday information More Doctor time Information on tiredness				
Suggestions and specific comments	Home HD patient experiences More time to talk to peers. Better time and parking issues "Would have liked more time to continue to discuss topics in more depth" "Maybe a film show would have been useful as he doesn't like to move from table to table but in the end he enjoyed".				

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Poster number: 052

Submission number: 218

Outcome data from the first 2.5 years of a newly developed medical percutaneous peritoneal dialysis catheter insertion service in a tertiary renal unit

Dr Robert Kimmitt, Dr Wilfred Okoroafor

Exeter Kidney Unit, Royal Devon University Healthcare NHS Foundation Trust, Exeter, UK, Exeter

Dr Robert Kimmitt

Biography
Robert is an academic clinical fellow and renal registrar, working with the Exeter Kidney Unit and the Universities of Exeter and Bristol. His interests within renal medicine include supportive kidney care, home dialysis therapies and the decision-making process for older and frailer patients considering future kidney therapy (such as conservative care and dialysis). He is a member of the UKKA Supportive Care SIG Research and Data subgroup.

Abstract

Introduction: Percutaneous peritoneal dialysis (PD) catheter insertion supports timely and flexible availability of PD access when inserted by a nephrologist. The ISPD and UK Kidney Association peritoneal access clinical guideline encourage renal units to promote development of both percutaneous and surgical PD catheter insertion to improve patient choice and timely insertion of PD catheters[1,2]. Despite this there are limited published data on outcomes from newly developed percutaneous PD catheter insertion services.

Our renal unit developed a medical PD catheter insertion service by the nephrologists with the first PD catheter placed in June 2021. We present data around PD catheter success rate and subsequent outcomes from the first 30 months of this service.

Methods: Every medical PD catheter insertion in our centre was prospectively logged with background data collected over time and outcome data collected in December 2023 from review of electronic patient clinical records. Descriptive statistics were applied using Microsoft Excel.

Results: 50 procedures were performed for 42 patients over a 30 month period with 3 primary operators.

Average age was 60 (range 28-88), average BMI was 26.2 (range 19.4-36.0), 74% were male, 21% had previous abdominal surgeries and four (8%) were acute starters on PD.

Early complications (<1 month following procedure) were: 2% bleed, 2% peritonitis, 2% peri-catheter leak and 8% catheter malfunction requiring procedural intervention. There were no exit site infections or visceral injuries.

21% of the patients came off PD for patient-related or medical reasons including renal transplantation, patient choice to switch modality, medical decision to switch modality and deaths.

Of the 33 patients who wanted maintenance PD: 4 catheters were removed for peritonitis and PD tube malfunction- 2 of whom ended up on HD, 1 had a surgical PD tube inserted and 1 ended up on conservative pathway. 29 (88%) are still on PD with a functional tube.

Discussion: The data demonstrates that a percutaneous PD catheter insertion program is a safe and effective way of offering patients quick and easy access to peritoneal dialysis. Complication rates are relatively low with a high primary function rate. Careful patient selection is important to increase success rate and minimise risks of the procedure. Access to medical PD catheter insertion has also allowed us to offer acute PD, which is gaining popularity in our centre.

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Poster number: 053

Submission number: 242

Communication is the Key!

Mrs Minaben Goraniya, Mrs susan Sharman

Leicester General hospital, Leicester

Mrs Minaben Goraniya

Biography
My name is Mina Goraniya and I work as a band 5 registered nurse in the renal community setting in Leicester. My job involves looking after kidney patients, training and supporting them for home dialysis and following them up along their dialysis journey. However, I also have an interest in working with patients in the pre-dialysis stage and conservative management.

Abstract

My name is Mina Goraniya and I work as a band 5 registered nurse in the renal community setting in Leicester. My job involves looking after kidney patients, training and supporting them for home dialysis and following them up along their dialysis journey. However, I also have an interest in working with patients in the pre-dialysis stage and I have a skill to be able to deliver information to patients in different languages. I can speak and understand 4 different Asian languages.

Leicester is a multi-cultural city. Nursing in Leicester with its diverse ethnic population can present some challenges. Within the renal community team, we saw some inequalities in kidney care and wanted to engage with elderly Asians whom English is not a first language. Due to the language barrier, elderly Asian patients were not able to grasp information accurately; there were limited opportunities for them to gain this knowledge in their own language.

Followed by previous health awareness event this local residential care home for elderly Asian residents was approached with the idea of holding a Kidney awareness event. The aim of the event was to speak with people in their first language giving advice and information relating to all aspects of kidney health. I was able to explain the links between diabetes, high blood pressure and renal disease.

On the day of the event round 20 residences attended. Some basic information on kidney and related health issues were given in English and Gujarati. They were provided with an opportunity talk together, to understand the content of the event and asked any questions. Blood pressure checks were carried out, to highlight the importance of early detection of possible problems. Some referrals were made to their GP surgeries for further investigations.

Long term aim is to reduce the risk of needing secondary care in an acute hospital setting if this can be prevented through community awareness or GP interventions at an earlier stage in primary care.

Evaluation forms were given in the end and feedback was very positive with comments including:

"This event was very useful, and I got better understanding as information was delivered in my own language".

"We would like to have more events like this in the future".

Events like this enable improved communication, encourage conversation and highlight the importance of recognising signs and symptoms relating to kidney health.

I felt I felt confident that these elderly Asians had a good understanding as this information was delivered in their own language.

As with the success of this event, it is hoped to hold similar events in the future in different community settings, supported living places and places of worship.

Poster number: 054

Submission number: 307

One-year peritoneal dialysis (PD) catheter patency outcomes, radiological and surgical insertion techniques

Dr Zain Ul Abideen, Dr Jyoti Baharani, Dr Amar Mahdi

University hospitals Birmingham, Birmingham

Dr Zain Ul Abideen

Biography
Consultant Nephrologist University Hospitals Birmingham

Abstract

Introduction: Timely placement of peritoneal dialysis access is crucial for long term success of a PD programme. PD catheters can be inserted percutaneously (by a nephrologist or interventional radiologist or surgically (using open dissection or laparoscopy). PD catheters placed by nephrologists (medical insertion) or radiologists have the advantage of being done quickly, and without the need for a general anaesthetic. Technical failure of PD catheter and infectious complications are common causes of early PD failure but UK data on primary patency rates and early infection are limited. Various studies have concluded no significant difference in catheter patency placed with different techniques [1]. The ISPD guidelines recommend centres to audit 12-month catheter patency rates, along with other important variables like peritonitis. We conducted a retrospective analysis of peritoneal dialysis catheter placements for patients to compare patency rates between different modes of catheter insertion.

Methods: This is a retrospective observational study looking at patients under care of the Birmingham heartlands hospital (BHH) who had a Peritoneal catheter insertion between January 2019 and January 2023. The minimum follow up period was 12 months. A total of 298 patients are included however ; we present here the results for 201 patients. Choice of catheter insertion modality was individualized, based on clinician guided judgement of patient suitability. Surgical catheter placement was performed at BHH and Queen Elizabeth Hospital while percutaneous insertion by a radiologist or nephrologist was performed at BHH.   Data was collected, entered and analysed by Microsoft excel and SPSS version 23.

Results: 201 patients had PD catheter insertions between January 2019 and March 2022. Mode of insertions were as follows; medical 93 (46 %), radiological 65 (32%) and surgical 43 (22%). 63/93 (68 %) patients had successful 1st insertion in the medical group, 48/65 (74%) in the radiological group and 30/43 (70%) in the surgical group. The overall success rate for first time insertions was 70.2% (141/201). Of the 60 catheters that were not successful in first attempt, 19 patients opted not to have a second procedure, while 32/41 (78%) had a successful insertion in the 2nd attempt. At 12 months, there was no significant difference in catheter survival between catheters inserted medically, radiologically and surgically (log rank test p=0.71). Mode of catheter insertion was not a predictor of catheter failure in the cox regression model

Discussion: Our preliminary results indicate similar 12-month PD catheter survival rates amongst 3 different modalities of PD catheter insertions. This correlates with data from previous published studies, including a meta-analysis[1]. PD insertions by nephrologists are safe, quick and effective means of obtaining peritoneal access. We aim to present results for the full cohort of our PD patients at the UKKW, alongside a comparison of other variables amongst insertion modality groups including rates of peritonitis and catheter leaks.

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Poster number: 055

Submission number: 113

Transforming assisted continuous ambulatory peritoneal dialysis training: A remote assisted programme to optimise Renal Technician training

Mrs Heidi Richards, Mrs Linsey Worsey

Baxter Healthcare, Compton

Mrs Heidi Richards

Biography
I qualified as a nurse in 2005, Developing my skills in Renal High Dependency, Haemodialysis and Kidney Transplant Units. I moved on to gain experience in Critical Care, Cardiology and Enzyme Replacement nursing. Consolidation of all these skills was utilised as a Medical Device, Account Manager providing training and support for a variety of healthcare professionals. In January 2023, I began working for Baxter as a Clinical Therapy Lead in Renal. In this role I can use my passion for renal to provide training and support to the Assisted Peritoneal Service. Deliver training and support to the Renal Technicians, as well as working closely with clinical therapy specialists, community trainers and Baxter Education centres to provide seamless support for the care of the assisted dialysis patient.

Abstract

Background: Assisted Peritoneal Dialysis provides a critical support system to patients unable to independently manage peritoneal dialysis. The training model involves newly recruited Renal Technicians (RTs) attending a five-day assisted Automated Peritoneal Dialysis (aAPD) course at the Midlands training centre and, if required, a logistically challenging 4 hour assisted Continuous Ambulatory Peritoneal Dialysis (aCAPD) training in the centre. Recognising the inefficiencies of this, we re-evaluated the training paradigm. To address the associated logistical concerns with aCAPD training and provide a practical solution, we introduced a pioneering remote aCAPD training programme. This transformative approach seeks to streamline aCAPD training, overcome logistical barriers and enhance the efficiency of RT education for the benefit of aCAPD patients.

Methods: To tackle these challenges and logistical hurdles such as RTs personal commitments and travel restrictions, a strategic approach was adopted. Collaborative discussions with the training manager for the RT employer were initiated to explore innovative solutions. This led to consideration of remote training at RTs homes. However, this proved logistically challenging. After discussion with the training lead at the London patient training centre a room was made available for remote training. The transition necessitated the detailed development of a comprehensive Standard Operating Procedure (SOP) to ensure the seamless delivery of remote aCAPD training Simultaneously, an assessment of the requisite equipment was conducted to facilitate an efficient training process.

Discussion: A thorough assessment was conducted by the Clinical Therapy Leads visiting the education centre. This comprehensive evaluation considered logistical and technical aspects of our training

implementation. The identification of the Telly-space system through a trial remote run-through emerged as a critical milestone. This virtual platform demonstrated superior functionality, positioning it as the optimal choice for delivering remote training sessions. Further reinforcement of the system's viability came from subsequent virtual trials underscoring its reliability and effectiveness.

Our results; Reflect the successful implementation of the remote training program. The collaborative team approach, with one team member providing on-site support and the other delivering training remotely, proved to be a successful strategy. Adoption of remote training reduced the overall training time to a commendable three and a half hours. Beyond time efficiency, this approach minimised travel costs for RTs and had a positive impact on their rota, addressing key concerns associated with traditional face-to-face training methods.

Conclusion: While our education centre currently accommodates face-to-face training for up to 5 RTs per aCAPD training session, room size and availability pose limitations at the patient training centre. To address these constraints and enhance the virtual training experience, we are considering the integration of Virtual Reality (VR). The potential use of VR technology holds promise for further refining and supporting our remote training sessions in the future, marking a continuous evolution toward a more advanced and efficient training modality. The transformation of aCAPD education should not only meet current challenges but also set a new standard for accessibility, cost-effectiveness, and adaptability in PD training.

Poster number: 056

Submission number: 560

A retrospective analysis of peritoneal dialysis catheter reinsertion over eleven years

Dr Emma Morganti, Dr Bhrigu Sood

Epsom and St Helier University Hospitals, London

Dr Emma Morganti

Biography
ST4 Renal and General Internal Medicine St Helier's Hospital

Abstract

Introduction: Increasing peritoneal dialysis (PD) uptake is limited by the shortened treatment time on PD compared with in-centre haemodialysis (HD). A transition from PD to HD is costly, and is associated with morbidity and impaired quality of life. There are numerous reasons why a PD catheter may need to be removed, and there is significant variability in patients having opportunity to come back to PD. We retrospectively analysed a sample of PD catheter insertions to assess impact of our practice to reduce permanent transfer to HD over eleven years in our renal unit.

Methods: A sample of 301 of 1061 PD catheter insertions from 01/01/2013 to 31/12/2023 in a renal unit were reviewed. Electronic databases and discharge summaries were reviewed for catheter duration, removal reason, whether they were reinserted, interim management and duration of management where available. Data was analysed in Microsoft Excel.

Results: The 301 catheters reviewed were related to 233 distinct patients. 68 (22.6%) remained in situ at the completion of follow up (31/12/2023). Of the 233 removed, 106 (45.5%) were removed for reasons which would not warrant consideration of reinsertion (transplantation 16.6%, death 9.4%, failure of PD 10.7%, patient preference 7.7%, regain of native renal function 0.9%).

Of the 126 (54.1%) which were removed for reasons which could allow for potential reinsertion (infection, malposition, accidental removal, hernias or leak), 62 (49.2%) were reinserted. The percentage of patients having reinsertion of catheters varied across years from 38.9 to 72.7%.

Of the 62 which were reinserted, we were able to review interim management for 57. 12.3% had a catheter reinserted on the same day, 57.9% had no interim renal replacement therapy, and 29.8% had interim haemodialysis. The longest duration of interim haemodialysis in this cohort was 493 days.

Discussion: Peritoneal dialysis is a preferred form of renal replacement therapy for many patients for a multitude of reasons. A significant proportion of patients transfer to HD within 2 years of starting PD. Practice to offer going back to PD after a catheter removal varies significantly amongst units. In this sample we can see that 49% of catheters removed for an indication which did not preclude reinsertion

were reinserted, allowing ongoing access for peritoneal dialysis. There is little information available to compare this with practices from other units. This study is limited as it is only sample of the data, and it was difficult to delineate decisions processes around whether reinsertion was appropriate from the available records. Going forward, we would aim to review all PD catheter insertions and removals for the time period and analyse what variables impacted outcomes.

Poster number: 057

Submission number: 569

Modelling peritoneal dialysis starts to support home dialysis growth

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[3]Barts Health NHS Trust, London.
[4]Epsom & St Helier University Hospitals NHS Trust, London

Dr Richard Corbett

Biography
Consultant Nephrologist, Hammersmith Hospital. Clinical Chair of Dialysis at Home Workstream, London Kidney Network

Abstract

Background: Sustainable growth in home dialysis modalities is a focus of the Renal Services Transformation Program. The Getting It Right First Time (GIRFT) program identified that all renal units should have access to adequate training facilities and staffing for home dialysis for at least 20% of their prevalent dialysis population within 12 months of report publication. Peritoneal dialysis (PD) is used as the predominant home dialysis treatment but patients in the UK have a shorter time on PD than many countries due to high transplantation rates. In order to explore how the 20% prevalent population might be achieved PD, simulations using real-world data were created.

Methods: Modelling simulations were created in Excel to explore prevalent dialysis populations over several years. An initial population size of 1000 patients with a 10% PD prevalence was used. An annual incident population of 350 dialysis patients with a conservative annual 2% growth was assumed. Previous work has identified that in units where access to PD is optimised and patients are allowed free choice of dialysis modality, approximately 33% will start dialysis on PD[1]. Finally, time on each dialysis modality was included; for PD this used PDOPPS[2] published data, where the UK has a median time of 1.7 years (interquartile range, 0.8-2.9). Local data for HD was used to inform the modelling.

Results: In centres with an incident PD population of 25% of all dialysis starts each year and assuming median PD and HD time on therapy to be 1.7 and 3.7 years respectively, a steady state was achieved after four years, with a prevalent 14% PD population. When the proportion of dialysis starts on PD is increased to 33%, after six years a prevalent 19% population is achieved.

As might be expected the wide variation in time on PD in the UK strongly affects PD prevalence. In centres with shorter time on PD (0.8 years), PD prevalence is lower (10% at 2 years with 33% incident PD population, 7% at 3 years with a 25% incident PD population). While centres with median time of 2.9

years see a higher prevalence (21% with a 25% incident PD population and 28% with a 33% incident PD population).

Discussion: Assuming a stable dialysis incident rate and time on treatment, PD prevalence will not continue to grow indefinitely but reaches a steady-state after a period of several years. Data from this model can be used to inform demand and capacity models required for both PD access and training, to ensure patients who choose PD can start on their therapy of choice.

Centres with longer time on PD and therefore a higher PD prevalence should ensure that this does not arise by limiting access to transplantation. Equally the short times on PD in some centres reflects the need to focus on maintaining standards of care, including low-levels of peritonitis to support growth in PD. Ultimately, to achieve sustainable growth in home dialysis, both access to HHD and PD need to be optimised.

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Poster number: 058

Submission number: 592

The bottom line with access issues; a retrospective audit of vascular access infections in a home haemodialysis population

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Dr Stephen Mahony

Biography

Senior Clinical Fellow Imperial College Healthcare Trust London. Interests in home therapies, transplantation, interventional nephrology, cardiorenal syndrome, hypertension, acute kidney injury. Irish SpR trainee currently doing a clinical fellowship with Imperial College Healthcare Trust with particular focus on home therapies. American Society of Nephrology Fellow membership, American Society of Diagnostic and Interventional Nephrology Fellow membership, Irish Nephrology Society

Abstract

Introduction: Home haemodialysis(HHD) offers people receiving haemodialysis the option of renal replacement therapy in the comfort of their homes. Concern regarding vascular access infections(VAI) and the use of indwelling tunnelled catheters to deliver home haemodialysis present a clinical challenge for nephrologists to deliver this service to patients. At our centre 75 percent of patients on home haemodialysis receive their treatment via a tunnelled dialysis catheter. We conducted an audit of prevalent and past patients on our home haemodialysis program to assess the rates of vascular access infection and compare the findings to rates of VAIs for home haemodialysis in the published literature.

Methods: All patient data was reviewed from Dec 2012 to November 2023, patients were included in the audit if they received one or more sessions of dialysis independently at home. Patients were excluded from the audit if they never completed a session of dialysis in their home independently despite training, one patient was excluded as their care involved prolonged periods of care abroad where we could not access data. A total of 93 patients were screened for the audit and 88 were included in the audit. Data was collected by reviewing clinical notes, microbiology lab results and discharge coding for each patient. We included Age, Sex, Vascular access type, incidences of VAI on HHD, Type of VAI(ie bloodstream infection, tunnellitis, exit site, superficial infection), microbial isolates and treatment approach to VAI. In addition for all past patients we collected data on cause of cessation of HHD(ie transplantation, switch to in centre haemodialysis, death). Microsoft Excel was used for data analysis.

Results: The population of 88 patients included 36 past and 52 prevalent patients on HHD. The average age was 53.4. 50/88 patients were male, 38/88 were female. VAI rate was 0.54/1000 access days, VAI rate for catheters was 0.63/1000 access days and VAI rate for AVF/AVG was 0.14/1000 access days. The incidence of vascular access related bloodstream infection was 0.28/1000 access days. Incidence rates of

catheter relalted bloodstream infection(CRBSI) was 0.31/1000 access days and incidence of bloodstream infection from AVF/AVG was 0.14/1000 access days. None of the episodes of VAI resulted in patient death. 11 line exchanges were needed for all 38 episodes of VAI. The most common organism isolated was Staph epidermidis (34%). The most common cause for cessation of HHD was transplantation(50%). (Tables/Graphs will be included in final presentation/poster)

Discussion: We demonstrate that tunnelled lines can be used safely in HHD. Our CRSBI of 0.31/1000 access days compares to similar rates published in the literature for patients on incentive haemodialysis and compares favourably against rates published in the literature for HHD(1,2). Our data correlates with the literature showing AV fistula have a lower rate of infection(3).

Conclusion: AV Fistula should remain the gold standard of access for patient's on HHD, however use of tunnelled lines to deliver renal replacement therapy in safe with appropriate supervision. Patients should play an active and informed role in the decision-making process regarding HHD including the risk/benefits of vascular access modalities. Our audit is part of initial data for a multicentred European analysis of vascular access infections in HHD. Further analysis including adjusting for variables will be carried out in the future as part of ongoing work.

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Poster number: 059

Submission number: 155

The use of imaging to determine response to mTORi in patients with tuberous sclerosis complex (TSC) and kidney angiomyolipomas (AMLs).

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Dr Daniel Livingstone

Biography
Dr Livingstone is a radiology trainee with an interest in GU and GI subspeciality imaging and the imaging of TSC.

Abstract

Background: Tuberous Sclerosis Complex (TSC) is a rare inherited multi-system condition. A significant cause of morbidity in this patient cohort is haemorrhage from kidney angiomyolipomas (AMLs) which can be life-threatening. Previously, the mainstay of treatment for these patients has been embolisation, although management has changed with the introduction of mTOR Inhibitor therapy (mTORi). Whilst these have been shown to reduce AML size with a corresponding reduction in bleeding risk, it is important to understand how AML volume and composition changes with time following initiation of mTORi therapy.

Methods: Retrospective review of cross-sectional imaging performed in patients on mTORi inhibition under the joint TSC services at St George's and Brighton and Sussex University Hospitals NHS Foundation Trusts.

Each scan was scored for the modality, size of the kidneys, size of the two largest AMLs and subjective percentage fat content of the two largest AMLs. The pre-treatment scan and all post-mTORi scans were reviewed.

Response was determined on the most recent scan compared to the pre-treatment scan.

Results: 6 patients were reviewed, 1 was excluded as they did not have baseline imaging available for review, final cohort of 5 patients.

Each patient was deemed to have subjectively responded to mTORi.

The time interval since start of mTORi and the last scan ranged from 15 – 75 months.

Overall Total Kidney Volume reduced by 20% on mTORi (range 10-31%) and percentage change in the sum volumes of AMLs was 62% (range 35-71%). Similarly, the decrease in the sum of the length diameters of AMLs showed an average reduction of 29%.

Subjective assessment of change in fat content showed 2 patients with an increase in the fat content of the AMLs, 1 patient with a decrease in the amount of fat within the AML and 2 patients with no change in the fat content.
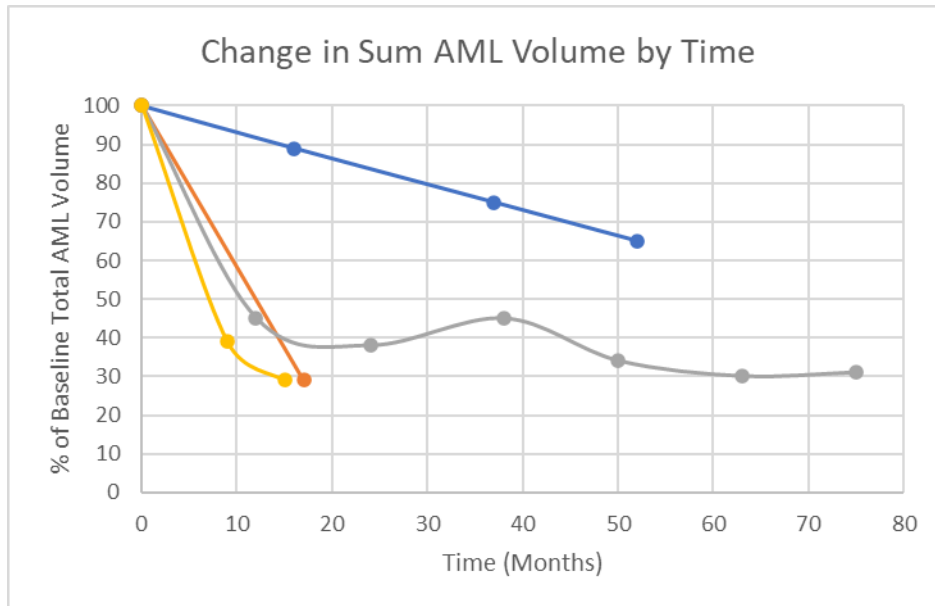
Conclusion: Radiologist subjective assessment of AML response to treatment corresponds with a reduction in the size of the AMLs of approximately 60% and a reduction in the overall size of the kidneys (which may be secondary to the reduction in the size of the AMLs themselves).

40% of patients showed some increase in the fat content of the AMLs.

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Poster number: 060 – WITHBRAWN

Whole-genome sequencing reveals contribution of rare and common variation to structural kidney and urinary tract malformations.

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Dr Melanie Chan

Biography
I am a nephrologist who has developed a subspecialty clinical and research interest in inherited kidney disease and structural urinary tract malformations. My research focuses on leveraging large-scale whole genome sequencing data to gain novel insights into the underlying genetic architecture of these and other conditions. I was awarded the UK Kidney Association Raine Award in 2023 for my contribution to renal research as a junior investigator.

Abstract

Introduction: Structural kidney and urinary tract malformations are the commonest cause of kidney failure in children and young adults. Targeted and whole-exome sequencing has identified over 50 monogenic causes for these phenotypically heterogeneous conditions but have largely focused on cohorts enriched for familial, syndromic, or consanguineous disease. We sought to better characterise the genetic architecture of these conditions using whole genome sequencing (WGS) data from the UK's 100,000 Genomes Project.

Methods: 992 unrelated individuals with structural kidney and urinary tract malformations were assessed using the Genomics England clinical interpretation pipeline to determine a genetic diagnosis. Statistically robust case-control association testing was performed using WGS data from a subset of 813 patients and 25,205 ancestry-matched unaffected individuals seeking enrichment of common and rare single-nucleotide and structural variants (SNV/SVs) on a genome-wide, per-gene, and *cis*-regulatory element basis. Heritability analysis was carried out in 623 cases and 20,060 controls of European ancestry with polygenic risk scores (PRS) derived for each of the six phenotypes. The PUV-PRS was validated in an independent cohort of 77 patients from the AGORA data- and biobank and an additional 2,746 European controls.

Results: The overall diagnostic yield was 4.3% (43/992; Figure 1) with age < 18 years (P=2.0x10^{-4}), family history (P=7.5x10^{-3}) and extra-renal features (P=1.9x10^{-4}) all independent predictors of a genetic diagnosis. The diagnostic yield was higher in cases with cystic kidney dysplasia (10.7%) or kidney anomalies (5.9%). *HNF1B* was the most frequently identified cause. Exome-wide rare variant analysis identified enrichment of SNV/indels affecting *AUTS2* (P=3.7x10^{-6}), *ARHGAP5* (P=6.0x10^{-6}), known kidney malformation gene *HNF1B* (P= 6.1x10^{-6}), and *ZNF879* (P=7.0x10^{-6}), all of which have been previously implicated in developmental and/or cancer pathways. An increased burden of rare SVs affecting *HNF1B* (P=3.1x10^{-4}) was observed. There was no evidence of enrichment for *cis*-regulatory element disrupting SVs. Genome-wide testing of 19 million common and low-frequency variants (minor allele frequency > 0.1%) did not detect any individual variants that were significantly associated in the total cohort, but together these variants were estimated to contribute to 23% (standard error 11%) of the heritability of kidney and urinary tract malformations in cases with European ancestry. Comparison of phenotype-specific PRS showed considerable overlap between kidney anomalies, cystic kidney dysplasia, obstructive uropathy and vesico-ureteric reflux but the polygenic contribution to PUV and bladder exstrophy was distinct (Figure 2). A PUV-PRS consisting of 36,106 variants was validated in an independent European cohort of 77 cases and 2,746 controls (empirical P=1x10^{-4}).

Discussion: We show that non-Mendelian genomic factors are important for the pathogenesis of structural kidney and urinary tract malformations, supported by the observation that a minority of patients in this large unselected cohort have a monogenic diagnosis. In addition, a significant proportion of heritability can be attributed to common and low-frequency variation and there is overlap in the polygenic contributors to upper urinary tract malformations with distinct polygenic signatures relevant to PUV and bladder exstrophy. Larger cohorts of patients are needed to increase power to detect variants contributing to this heritability and identify biological mechanisms and pathways important for kidney and urinary tract development.

Figure 1. The genetic diagnoses identified in 43 patients with structural urinary tract malformations.
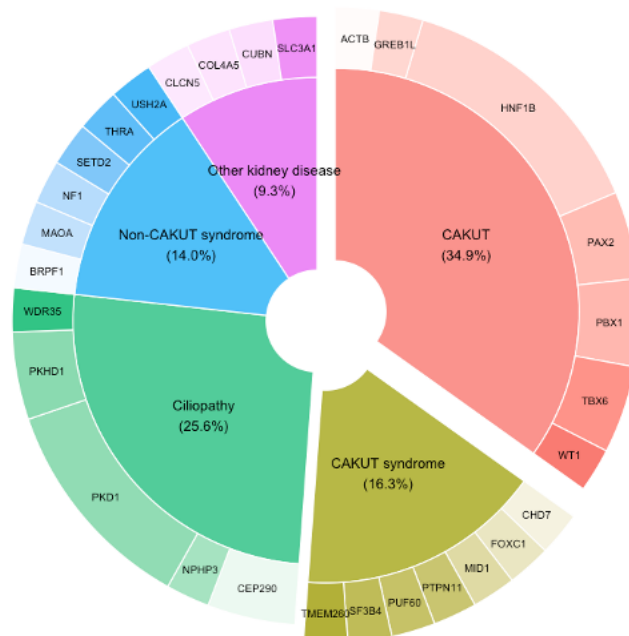
Figure 2. Comparison of phenotype-derived polygenic risk scores (PRS) across different structural urinary tract malformations. R^2 is the coefficient of determination used to indicate the predictive ability of the PRS.
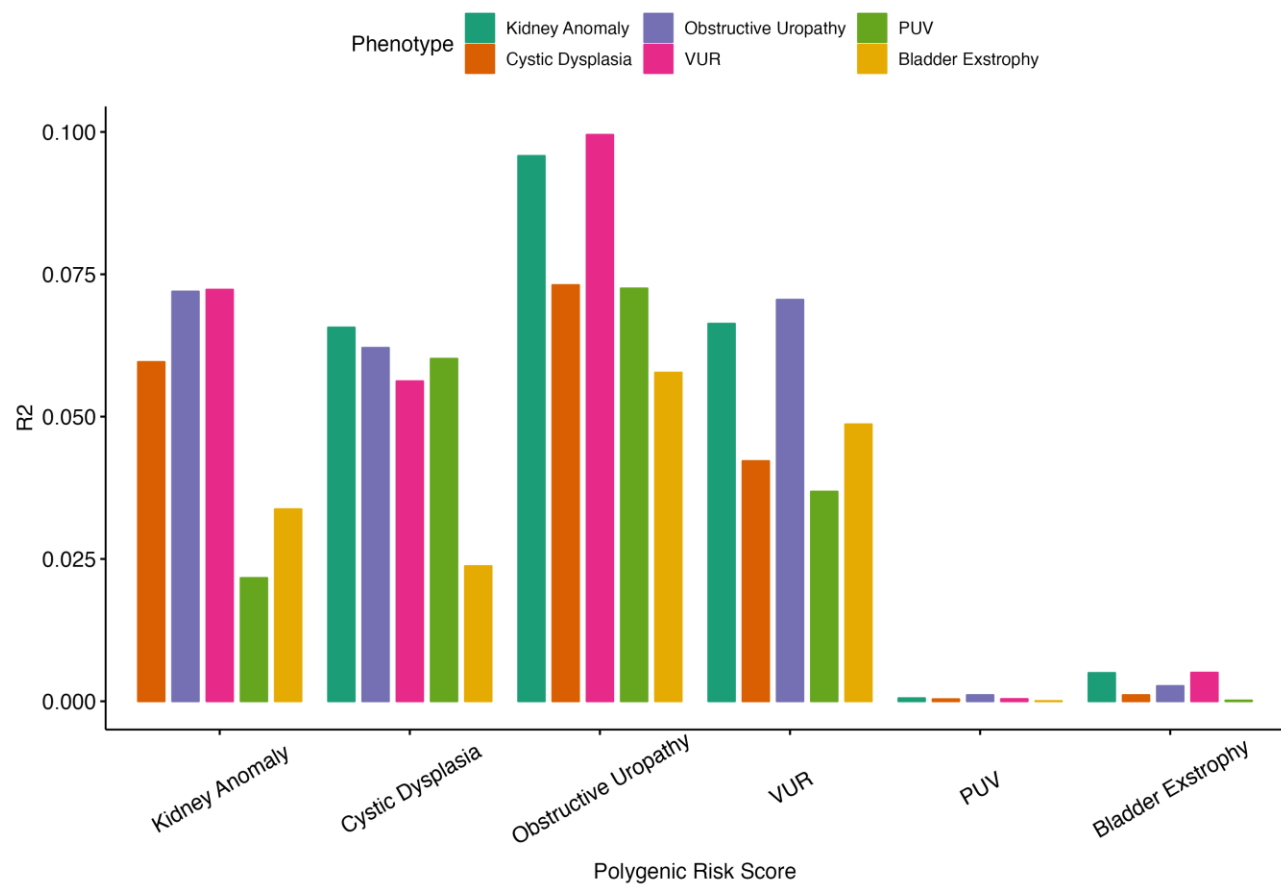
Poster number: 062

Submission number: 222

Gene Panel Testing for Patients with Haematuria

Dr Thomas Oates, Ms Ruth Nicholson, Dr Andy Buckton

London, UK

Dr Thomas Oates

Biography
Tom Oates is a Consultant Physician at the Royal London Hospital. He specialises in nephrotic syndrome, genetic kidney disease, haemodialysis, kidney transplantation, and acute kidney injury. He has a strong commitment to innovation in healthcare both in genomics and the use of data, and is the clinical Lead for nephrology at the North Thames Genomic Laboratory Hub.

Abstract

Introduction: Genomic testing is now commissioned by the NHS in England for patients suspected of having rare and inherited diseases. Haematuria plus one of, a first degree relative with haematuria or unexplained chronic kidney disease (CKD); electron microscopic examination of kidney biopsy material showing evidence of either Alport Syndrome or Thin Basement Membrane Nephropathy (TBMN); hearing or eye features of Alport syndrome, qualifies patients for sequencing of COL4A1, COL4A3, COL4A4, COL4A5 and MYH9 genes. Here we report the results of this testing from a single Genomic test centre.

Methods: Consecutive cases submitted for testing of the R194 haematuria gene panel at the North Thames Genomic Laboratory Hub prior to Jul 2023 were collected. Information on indication for the test was taken from free text forms submitted with blood samples and matched with relevant sequencing results from small panel gene sequencing of the genes mentioned in the introduction. The North Thames Genomic Lab Hub employs the TWIST BioSciences Exome v1.0 with added custom content. Sequencing is conducted on the Illumina NovaSeq with paired-end 150bp reads, subsequent data analysis is performed using an in-house developed pipeline.

Results: 192 submissions were identified. Age was bimodally distributed with modes at 12 and 43 years of age. Median age was 23 years (IQR 31). 52% of patients were male. 55% of cases had a relevant family history recorded. For 32% this was haematuria, 19% CKD, and 4% Alport syndrome or TBMN. Specific biopsy findings were reported in 28% of cases, of which 20% were TBMN, 5% features of Alport Syndrome, and 3% other histopathological findings. 9% of cases had extra-renal features of Alport Syndrome in their requesting information.

Variants were detected in 67 out of 183 (37%) patients for whom sequencing results were available. 66 out of 67 variants were in COL4 genes. 58 out of 67 were rated as "pathogenic" or "likely pathogenic". Definite pathogenic variants were commonest in the COL4A4 gene (see plot). Digenic variants were seen in 2 patients.

Patients for whom kidney biopsy information was included in the request form were more likely to have a genetic variant, X^2 (df = 1, N = 183) = 6.93, P = 0.008, as were those who had a relevant family history recorded, X^2 (df = 3, N = 183) = 9.08, P = 0.028.

Discussion: Sequencing of a panel of relevant genes in a cohort of approximately 190 patients with haematuria yielded a genetic diagnosis in 37% of cases. Patients who had had a kidney biopsy, or for whom a relevant family history was present in requesting information were more likely to have a genetic diagnosis. Given that some patients did not have sufficient information on their request form to prove they met the criteria for testing mentioned in the introduction, genetic diagnoses could possibly be even higher if these criteria are more strictly adhered to.
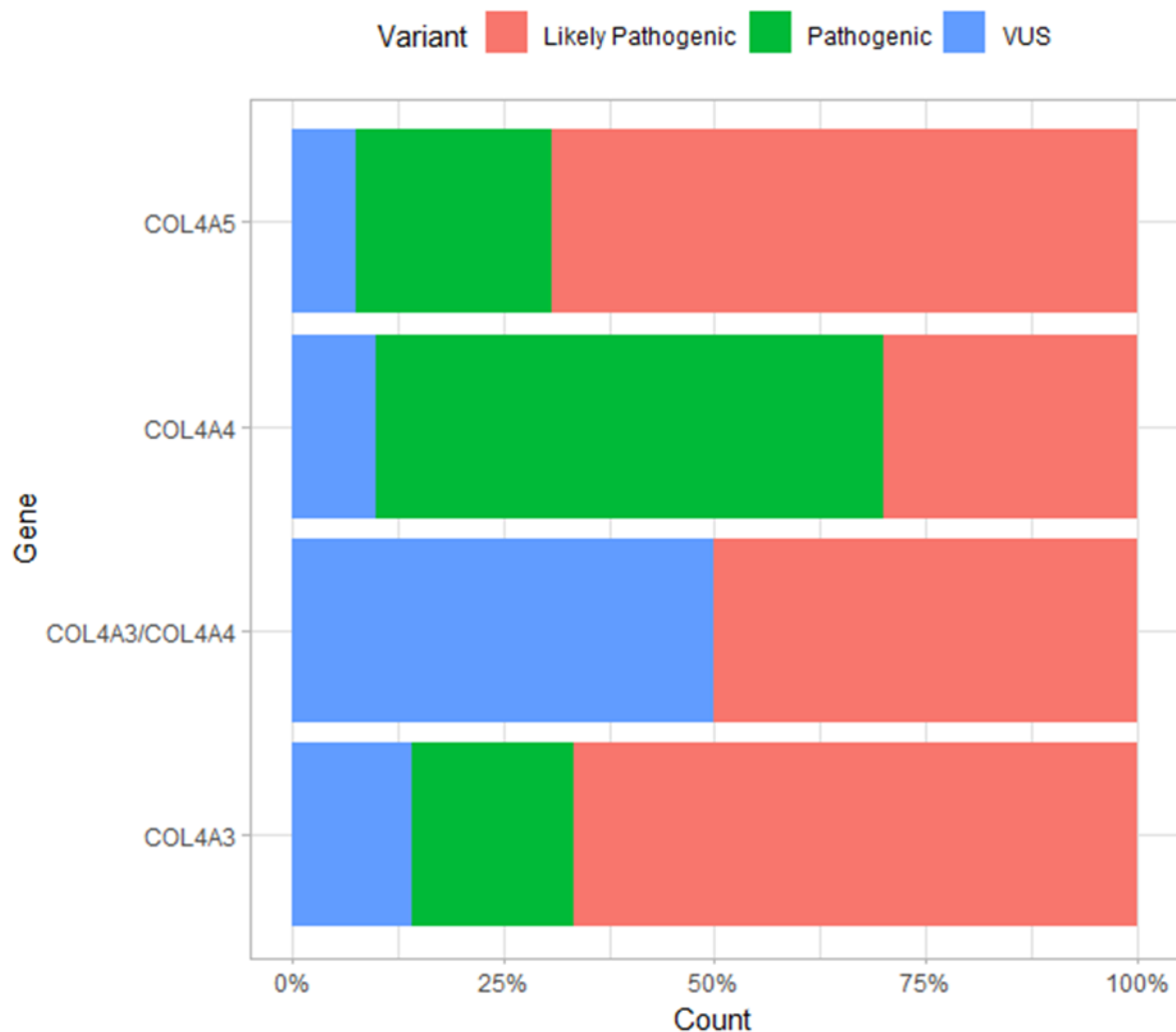
Poster number 063

Submission number: 229

Genome wide association study of UK Biobank data reveals insights into genetic architecture of Urinary Tract Infection

<u>Dr Patrick Trotter</u>[1], Dr Qi Gou[2], Dr Kevin Loudon[1], Professor Adam Butterworth[3], Professor Menna Clatworthy[1]

[1]Department of Medicine, University of Cambridge.
[2]Department of Public Health, University of Cambridge.
[3]Department of Public Health and Primary Care, University of Cambridge

Dr Patrick Trotter

Biography
I am a Clinical Lecturer in Renal Medicine at the University of Cambridge. I am also currently a year 4 speciality registrar in Renal Medicine working at Addenbrooke's Hospital in Cambridge. Prior to this I was an NIHR funded Academic Clinical Fellow in Internal Medicine and Renal Medicine at the University of Cambridge and Addenbrooke's Hospital. I completed my PhD, funded by NHS Blood and Transplant, at the University of Cambridge, Department of Surgery and Department of Medicine, principally investigating the impact that donors with infection have on organ donation, utilisation, and transplantation. During my PhD I also investigated the role that recipient and donor genetics play on susceptibility to viral infection, specifically BK virus, post-kidney transplantation. I have a keen interest in how we can use bioinformatics and large registry datasets to increase organ donation and transplantation from donors with infection safely.

Abstract

Introduction: Urinary tract infections (UTI) are among the most common bacterial infections in the world. They are estimated to affect over 150 million people every year and around 50% of women experience a UTI in their lifetime. Host genetics influence susceptibility to many infections leading to differences in clinical outcome but previous investigation of genetic contributions to UTI largely involve candidate gene small case-control studies, potentially leading to erroneous associations. Genome Wide Association Studies (GWAS) aim to identify causative genetic variants underpinning phenotype susceptibility by testing differences in allele frequency of >500,000 single nucleotide polymorphisms (SNPs) between cases and controls. There is only one previously published UTI GWAS, but this lacked robust case identification and had no validation cohort. We sought to better define genetic conributions to UTI susceptibility by performing a GWAS using UK Biobank (UKBB) data.

Methods: We utilised questionnaire data of self-declared UTI, as well as hospital diagnosis and GP diagnosis of UTI, for 202,198 participants in the UKBB. These individuals had undergone SNP genotyping using UKBB array or the UK UKBiLEVE array. Following variant and sample QC, BOLT-LMM, a Bayesian mixed model association method was utilised to perform a GWAS of cases with UTI vs. Controls, defined as individuals without a history of UTI. The model was adjusted for age[2], sex (male/ female), genotyping

array and the first 10 principal components. Haploreg was used explore whether any of the significant SNPs identified might link to functional mutations or have potential regulatory functions. Genome wide significance was defined as P values of < 5×10^{-8}.

Results: Of the 202,198 participants in the UKBB used in the present analysis, 52,116 had suffered a UTI (25.7%). Of these 37,469 (71.3%) were female and the remaining 15,075 (28.7%) were male. The GWAS identified 75 SNPs reaching genome wide significance with a minor allele frequency (MAF) >0.05 (Figure 1). These SNPs were located in two genomic risk loci on chromosome 6 and 11. 7 SNPs in high linkage disequilibrium (LD) with the index SNP identified on chromosome 6 replicated in an independent GWAS performed on participants in 23andMe with recurrent UTI, at p-value <1 x 10^{-6}, with a further 777 SNPs (765 on chromosome 6 and 12 on chromosome 11) replicating to suggestive significance (p-value between 3.5 x 10^{-3} to 1 x 10^{-6}). The genomic risk loci on chromosome 6 is adjacent to the gene rich HLA-adjacent segment our genome and several of the candidate genes identified have implications in our immune response namely BTN3A1, BTN3A2, BTN3A3, and BTN2A2, which all have putative roles in T-cell activation and response to cytokines. We derived genetic bivariate correlation estimates between UTI susceptibility and other traits in the UKBB. After Bonferroni correction there were 268 phenotypes that were significantly correlated with UTI. Interestingly UTI seemed to be positively associated with psychiatric illness/traits, namely depression phenotypes.
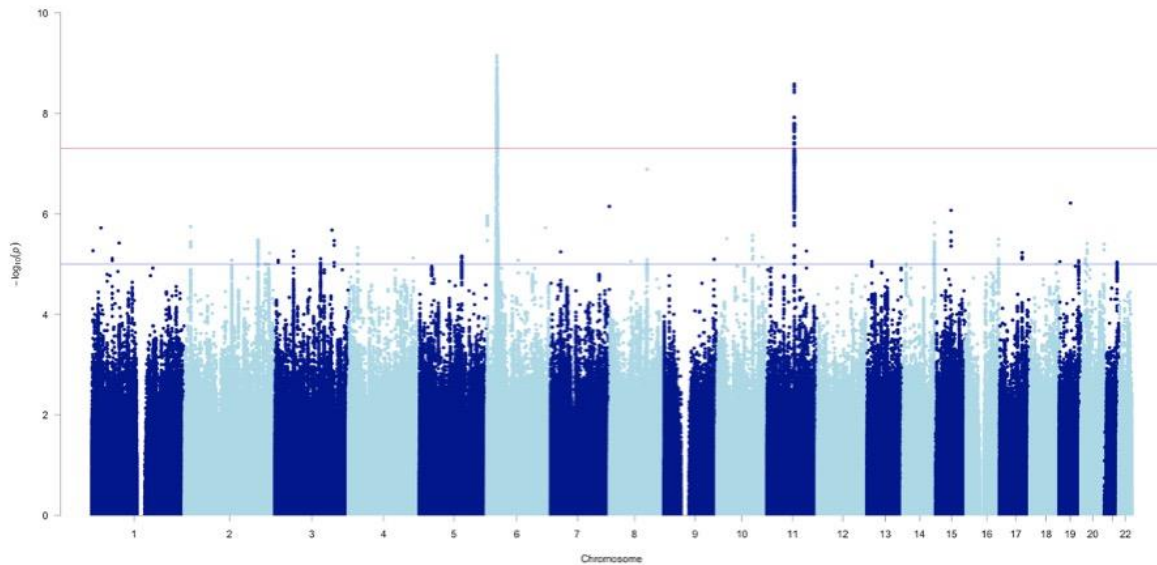
Figure 1. Manhattan plot of common variant GWAS for urinary tract infection (UTI). Each point is the negative $\log_{10}$ transformed P value of a variant for association with UTI, with the red dotted line indicative of genome-wide significance that accounts for multiple comparisons ($P < 5 \times 10^{-8}$).

Discussion: UTI is a leading cause of morbidity worldwide, with a substantial public-health and health economic burden. In this study we gleaned novel insights into the genetic aetiology of UTI and implicated genes with translational potential. The cohorts contributing to this study were composed of European descent populations. In the future, large-scale whole-genome sequencing studies of well-phenotyped individuals across diverse populations should capture the full allele frequency and variation type spectrum and afford further insights into UTI susceptibility.

Poster number: 064

Submission number: 330

Introducing CILIAREN – the MRC / NIHR-funded Renal Ciliopathies National Network

Ms Tess Harris[1], Prof John Sayer[2], Prof Eamonn Sheridan[3], Prof Pleasantine Mill[4]

[1]91 Royal College St,, London. [2]Biosciences Institute, Newcastle University, Newcastle upon Tyne. [3]Human Genetics, Leeds University, Leeds. [4]MRC Human Genetics Unit, Institute for Genetics and Cancer, Edinburgh University, Edinburgh

Ms Tess Harris

Biography
Chief Executive at Polycystic Kidney Disease Charity UK

Abstract

Introduction : The renal ciliopathies represent group of rare inherited kidney diseases affecting around 10% of all patients with kidney failure. The most commonly seen form of renal ciliopathy is autosomal dominant polycystic kidney disease (ADPKD). Recently the first drugs have come to the clinic to slow down ADPKD but treatments that prevent or switch off the disease are still lacking.

Together, out of all people living with a rare disease, the renal ciliopathies capture a relatively large patient group with several thousands of people in the UK affected. Individually each renal ciliopathy is rare, sometimes ultrarare, and caused by mutations in different genes. However, as a group, renal ciliopathy patients represent a significant unmet challenge for our health care system, one which is currently not being addressed.

Methods : Using modern genetics and advanced cell biology, we have now gained some important insights into this group of diseases. We have begun to align these patient cohorts and build on the RaDaR database to exploit our expertise in molecular diagnostics, deep clinical phenotyping and disease modelling in order to accelerate the development of novel therapeutics. As one of 11 jointly-funded MRC / NIHR UK Rare Disease Research Platform nodes, we are pleased to launch CILIAREN to deliver this vision. We have designed key objectives to facilitate this.

Our objectives are to harmonise clinical, imaging and molecular genetic investigations for all renal ciliopathy patients in across the UK; improve genomic interpretation of underlying genetic variants and how these changes influence disease progression; and create well characterised groups of people living with a rare disease who are eligible to participate in trials for new personalised medicine treatments.

Results : Currently, within RaDaR (the UK National Registry of Rare Kidney Diseases) we have identified 8507 patients with ADPKD and 259 with recessive renal ciliopathies.

We believe that through participation in clinical studies of these patients living with renal ciliopathies, we can use our expertise and knowledge of specialist techniques and understand how mutations in different genes cause disease, model how they disrupt kidney function and identify ways to halt or reverse disease progression with modelling to accelerate the development of new and innovative treatments.

Discussion: We have begun to create a national system of support for ciliopathy patients and their families through partnerships with patient groups and charities (PKD Charity, Kidney Research UK, Ciliopathy Alliance, BBS UK). We believe that involving patients in these early steps will shape how new ideas are transformed into new treatments for renal ciliopathies - leading to better designed trials and more meaningful outcomes.

In summary, CILIAREN aims to improve renal ciliopathy patient care nationwide, to develop the infrastructure for stratified patient cohorts groups ready to participate in clinical trials and build partnerships with academics and industry (ciliaren.org).

Poster number: 065

Submission number: 273

Epigenetic data can predict initial treatment response in nephrotic syndrome.

Dr Samantha Hayward[1,2], Dr Matthew Suderman[3], Professor Gavin Welsh[1], Professor Moin Saleem[1]

[1]Bristol Renal, University of Bristol.
[2]Southmead Hospital, North Bristol NHS Trust.
[3]MRC-Integrative Epidemiology Unit, University of Bristol

Dr Samantha Hayward

Biography
I am a kidney doctor with an interest in genomics and molecular epidemiology. My PhD research focuses on people with Nephrotic syndrome; I am utilising machine learning to interrogate the genetic and epigenetic profiles of people with this kidney disorder to improve our understanding of disease drivers and our ability to predict prognosis.

Abstract

Introduction: The majority of children with idiopathic nephrotic syndrome (INS) and adults with Focal Segmental Glomerulosclerosis (FSGS) and Minimal Change Disease (MCD) receive glucocorticoid treatment at diagnosis. Only those with a high likelihood of having monogenic disease or a contraindication to steroids might avoid this treatment (1). About 10% overall will not respond to steroids and we have no reliable way of prospectively identifying these patients (2). Therefore, some patients will receive a futile treatment which is accompanied by significant side effects.

DNA methylation (DNAm) is an epigenetic mechanism meaning that it can induce stable but reversible changes in gene expression without any change in underlying DNA sequence. DNAm has shown great potential as a treatment stratification tool, for example, DNAm data is used in oncology to identify which patients are likely to benefit from alkylating chemotherapy (3).

We investigated whether DNAm can predict initial response to steroids in children and young adults with nephrotic syndrome.

Methods: 317 patients with INS were selected from the NephroS and NURTuRE cohorts. All patients were diagnosed with INS ≤ 30 years of age and those who underwent a renal biopsy had a histological diagnosis of either FSGS or MCD. Peripheral blood DNAm measurements were generated using the Illumina MethylationEPIC Beadchip (>850,000 CpG sites). Clinical data was used to label patients by their initial response to steroids (sensitive, n=156, or resistant, n=161).

Machine learning models were created to predict steroid response from the DNAm data. Models were generated using elastic net following feature filtering, and model hyperparameters were tuned and performance measured within the context of cross validation.

To exclude whether cumulative steroid exposure prior to sample collection had impacted our results, the CpG sites in the final model were compared to those identified in a published study examining steroid exposure and DNAm (4).

Results: The 317 INS patients had a median age at diagnosis of 5 years (IQR 2-10) and a median time between diagnosis and DNAm sample collection of 4 years (IQR 1-10). The steroid resistant group were made up of patients with known monogenic disease (n=75, 24%) and those without pathogenic variants (n=86, 27%).

Initial response to steroid treatment could be predicted with 65% accuracy and an area under the curve (AUC) of 0.75, (sensitivity 0.65, specificity of 0.66, see Figure 1) using DNAm levels at 14 CpG sites. There was no overlap between the 14 CpG sites in our prediction model and those that are known to alter with steroid treatment.

Discussion

We have demonstrated that peripheral blood cell DNAm profiles are a promising predictor of steroid response in INS. Further work to incorporate genetic data into the prediction models is underway and external validation of the results in a separate cohort of patients is required.

Figure 1. Receiver Operating Characteristic Curve for the DNAm-based steroid response prediction model.
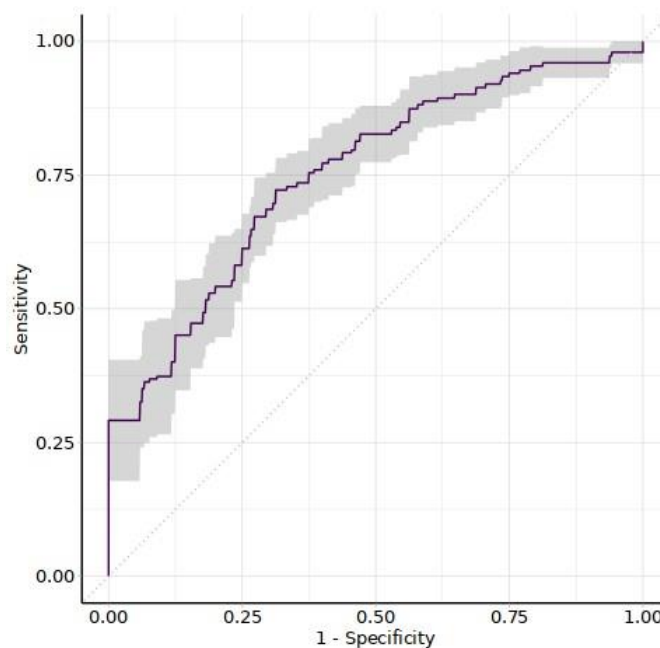
AUC 0.75 – The purple line corresponds to the average model performance across the 10 test folds of the data. The grey area corresponds to the range in performance across the 10 folds.

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4. Wiencke, J.K., Molinaro, A.M., Warrier, G., et al. DNA methylation as a pharmacodynamic marker of glucocorticoid response and glioma survival. Nature Communications 2022; 13: 5505.

Poster number: 066

Submission number: 282

Treatment of Tolvaptan related polyuria with bendroflumethiazide for ADPKD: Does it really work?

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[1]Royal Free London NHS Foundation Trust, London.
[2]University College London, London

Dr Noella Ahn

Biography
I am a clinical research Renal Genomics Fellow in Royal Free Hospital. I completed my nephrology training in New Zealand and my interest is in genetics renal disease.

Abstract

Introduction: Autosomal dominant polycystic kidney disease (ADPKD) is the most common hereditary renal disease worldwide and accounts for 10% of patients on renal replacement therapy. Currently, the arginine vasopressin (AVP) V2 receptor antagonist Tolvaptan is the only available treatment for ADPKD which slows cyst formation and thus the progression of kidney disease by inducing AVP resistance. However, its aquaretic side effects can be debilitating and is the most common reason for medication discontinuation. Thiazides such as bendroflumethiazide are natriuresis-promoting diuretics through their action on the sodium-chloride channel in the distal convoluted tubule that are widely used to treat polyuria in inherited AVP deficiency or resistance. However, there is limited information about their effect in patients treated with Tolvaptan. The aim of this observational study is to review the impact on patients' quality of life by using a low dose bendroflumethiazide with Tolvaptan in patients with ADPKD who are suffering from Tolvaptan induced aquaretic side effects.

Methods: Details of all patients with ADPKD who are on Tolvaptan with or without bendroflumethiazide who are currently attending the polycystic kidney disease (PKD) clinic at Royal Free London NHS Foundation Trust were obtained, and their medications reviewed. Patients who have previously been or were currently on bendroflumethiazide to enable them to continue Tolvaptan therapy were identified. Information about the impact of bendroflumethiazide on their quality of life and their aquaretic side effects were obtained via phone call. If they discontinued bendroflumethiazide, the reason for this was explored. In addition, eGFR, sodium, potassium, and calcium at the time of bendroflumethiazide initiation as well as at three, six, nine and twelve months post bendroflumethiazide initiation were obtained.

Results: Out of 136 patients receiving Tolvaptan for treatment of ADPKD at our centre, eight (5.8%) were prescribed bendroflumethiazide for treatment of their aquaretic side effects from Tolvaptan. Two of these eight patients (25%) stopped bendroflumethiazide due to adverse reactions. The remaining six patients (75%) remained on the medication, and all reported significant subjective improvement in their symptoms of polyuria, nocturia and in their overall quality of life. Two of the six patients (33.3%) that

remained on bendroflumethiazide had also subsequently increased their Tolvaptan dose. No electrolyte disturbances were noted after initiation of bendroflumethiazide.

Discussions: Using bendroflumethiazide appears to improve the quality of life through reduction of polyuria and nocturia in patients suffering from Tolvaptan-induced aquaretic side effects with some patients subsequently able to increase their Tolvaptan dose by taking bendroflumethiazide which might result in augmented therapeutic benefit of Tolvaptan. Further placebo-controlled randomised studies with longitudinal will be needed to determine the true benefit-disbenefit balance of thiazide therapy in patients taking tolvaptan, especially to determine whether there is a negative effect on efficacy of tolvaptan on the underlying ADPKD. However, based on our small observational study, the number of patients needed to determine whether bendroflumethiazide improves the tolerability and medication adherence in patients who are debilitated by the aquaretic side effects of Tolvaptan would be small.

Whole genome sequencing in cystic renal disease – an NHS England service evaluation

Dr Tobias MacCarthy[1], Dr Wen Ding[1], Dr Ian Berry[2], Dr Caroline Platt[1,2]

[1]Bristol Royal Hospital for Children, Bristol. [2]South West Genomics Laboratory Hub, Bristol

Dr Tobias MacCarthy

Biography
Dr Tobias MacCarthy MA (Hons), MB BChir completed his undergraduate medical training at the University of Cambridge, intercalating in Pharmacology in 2019 and finally graduating with distinction in 2022. He is currently practising as a foundation year 2 doctor in the Severn deanery and during his time in the Bristol Royal Hospital for Children, he became involved in work as part of the cystic renal genomic service evaluation working group, who have produced this abstract.

Abstract

Introduction: NHS England offers comprehensive genomic testing for patients with cystic renal disease and is the first national health system in the world to provide whole genome sequencing (WGS) to patients as part of routine clinical care. Testing for genetic causes of cystic renal disease has been through a WGS platform since April 2021, provided by the South West and North Thames Genomic Lab Hubs (SWGLH and NTGLH). The virtual panel (R193 test code) covers 111 'green' genes, where strong evidence exists for a disease – gene association. We present data on all cases tested through R193 (WGS) in England since this time.

Methods: An initial data set was generated from the centralised Genomics England (GEL) database to include all patients across England tested through WGS between April 2021 and December 2023. Patients were eligible for testing if they fulfilled criteria specified in the National Genomic Test Directory (NGTD) for 'R193 cystic renal disease'. The data set captured information on demographics (age, sex, ethnicity, geographic location) alongside molecular variant data for those classified as pathogenic (P), likely pathogenic (LP) and of uncertain significance (VUS). Children were defined as individuals below 18 years of age on 1st December 2023.

Results: 1783 individuals were tested through WGS using the R193 test code between April 2021 and December 2023. Of the 1783, 262 individuals (14.7%) were below 18 years of age and defined as children. The median age of the cohort was 42 years (range 0 to 91 years). 1154 patients (65%) were of White, 126 (7%) Asian, 91 (5%) Black ethnicity with 344 (19%) unrecorded. 923 (52%) were female, 858 (48%) were male and 2 had unrecorded sex. 47 individuals had more than 1 variant that was pathogenic, likely pathogenic or VUS. 795 pathogenic or likely pathogenic variants (43.4%) and 120 VUS (6.7%) were reported in a total of 20 'green' genes. The majority of these variants were in the PKD1 (32.1%), followed by PKD2 (9.0%), PKHD1 (2.3%), IFT140 (1.5%) and HNF1B (1.0%) genes. In children, 99 (35.5%) pathogenic or likely pathogenic variants and 20 (7.2%) VUS were reported. PKD1 variants were

the most common (19.7%), followed by PKHD1 (8.9%), PKD2 (3.5%) and HNF1B (3.9%). There was only one IFT140 variant reported in children. The majority of IFT140 cases were identified through a post-hoc analysis following addition of the gene to the R193 GMS panel in November 2022.

Discussion: The overall diagnostic yield for patients undergoing genetic testing for cystic renal disease is excellent. WGS technology has clear benefits in renal genomics, including the ability to capture intronic variants, improved capture of pseudogene-impacted exons (for example in PKD1), and in providing a platform for re-analysis where required (as with the IFT140 variants identified). WGS therefore has an enhanced diagnostic yield with significant impacts on patient diagnosis, treatment, prognostication and genetic counselling. Our data thus outlines the crucial and expanding role of WGS technology in the diagnosis and management of rare disease.

Poster number: 068

Submission number: 306

Follow up data from the first national Fibromuscular Dysplasia (FMD) service

Dr Constantina Chrysochou[1,2], Dr Avanti Damle[1], Dr Aine deBhailis[1]

[1]Northern Care Alliance, Renal Department.
[2]University of Manchester, Manchester

Dr Constantina Chrysochou

Biography
Dr Constantina (Tina) Chrysochou is a consultant nephrologist at Salford Royal Hospital and Honorary Senior Lecturer at the University of Manchester. She is the principal investigator for the UK FMD study, lead for the RADAR FMD specialist interest group and dedicated FMD clinic accepting patients across the country. Other interests include atheromatous renovascular disease, glomerulonephritis and dialysis. Dr Chrysochou set up the Health Services Journal award-winning renal Young Adults Clinic at Salford Royal Hospital, and is the sub-group lead on Transition for the Renal Services Transformation Programme. The Young Adult Clinic was also used as a model of innovative, patient-centred care in the EGA Leadership Masters programme. Dr Chrysochou is the Northern Care Alliance Lead for Freedom to Speak up Team who were finalists in the 2020 Health Services Journal FTSU Organisation of the year.

Abstract

Introduction: FMD is considered a rare condition with the result centres may only see a handful of cases over time without dedicated expertise or multi-professional collaboration. We now know FMD can be associated with severe hypertension, ischaemic or haemorrhagic stroke, myocardial infarction and end stage renal disease. The condition can lead to invasive procedures such as percutaneous angioplasty, reconstructive surgery, or intracranial aneurysm clipping. Thus, both the disease and its treatment can lead to significant morbidity and mortality and require individual treatment plans.

Methods: Spurred by patient support group collaboration, we herein describe a dedicated, multi-professional FMD clinic which has grown to accept patients across the UK. The clinic benefits from renal, neurology, neuroradiology and interventional radiology input. We present 4 years of prospective data collection. Patients are given the opportunity to participate in research projects e.g. RADAR and the UK-FMD study. Local sponsorship agreement was secured. The diagnosis of FMD was unifocal or multi-focal as per international consensus criteria requiring the presence of a stenotic lesion in at least one arterial bed. Atypical FMD was defined in patients < 60-year-old presenting with at least 1dissection or 2 aneurysms, but in the absence string-of-beads, focal stenosis or evidence of inherited arteriopathy.

Results: 125 patients have been reviewed in the clinic to date, 55 from within the catchment area. 44 patients had a final diagnosis of FMD alone, 10 FMD and spontaneous coronary artery dissection (SCAD), four had Middle Aortic Syndrome variant of FMD, one both atheromatous renovascular disease and FMD, three SCAD alone. Five were classified as having atypical FMD. 19 patients were found to have an

alternative diagnosis requiring a different management plan e.g. Vascular Ehlers Danlos, Anti-Phospholipid antibody syndrome, Takayasu's or Neurofibromatosis. 82% of patients with FMD were female, 80% hypertensive, 39% smokers or ex-smokers at presentation. Subsequent surveillance imaging identified patients where closer follow up or intervention e.g neurosurgical was required. A minority developed new hypertension on follow up, only one had a subsequent cardiovascular event not anticipated based on imaging on follow up.

Discussion: We herein present early follow up data for the first MDT FMD clinic accepting referrals from across the country. There was a low incidence of disease progression or subsequent cardiovascular events once optimal medical management and surveillance imaging was implemented. A higher number than anticipated had FMD either ruled out once high-resolution imaging was used, or had an alternative diagnosis requiring urgent onwards referral. Bespoke treatment plans were created, patients signposted to a peer support group and given the opportunity to participate in further research, thus honouring the wish list drafted by patients.

Poster number: 069

Submission number: 320

The UK FMD study : first multi-site research study in FMD. Rationale and early data

Dr Constantina Chrysochou[1,2], Dr Bean Dhaun[3], Dr Pauline Swift[4], Dr Spoorthy Kulkarni[5]

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[2]University of Manchester, Manchester, UK.
[3]Edinburgh, UK.
[4]Epsom and St Helier, UK.
[5]Cambridge, UK

Dr Constantina Chrysochou

Biography
Dr Constantina (Tina) Chrysochou is a consultant nephrologist at Salford Royal Hospital and Honorary Senior Lecturer at the University of Manchester. She is the principal investigator for the UK FMD study, lead for the RADAR FMD specialist interest group and dedicated FMD clinic accepting patients across the country. Other interests include atheromatous renovascular disease, glomerulonephritis and dialysis. Dr Chrysochou set up the Health Services Journal award-winning renal Young Adults Clinic at Salford Royal Hospital, and is the sub-group lead on Transition for the Renal Services Transformation Programme. The Young Adult Clinic was also used as a model of innovative, patient-centred care in the EGA Leadership Masters programme. Dr Chrysochou is the Northern Care Alliance Lead for Freedom to Speak up Team who were finalists in the 2020 Health Services Journal FTSU Organisation of the year.

Abstract

Introduction: FMD is a rare condition of unknown etiology and pathogenesis. Little is known about the risk and determinants of complications and progression of the disease. Data from American and European FMD registries have started progressing knowledge and understanding of this condition which may be more common than thought. We aimed to set up the UK's first national study of patients with FMD. This is an observational study with optional bio-banking for genetics and biomarker studies. Our aim was to align our data collection fields with those of the European/ International Fibromuscular Dysplasia Registry and Initiative (FEIRI) to enable comparative data collection and pooling of information.

Methods: FEIRI was first established in 2015 and subsequently endorsed by the European Society of Hypertension in 2016. Ethical approval and local sponsorship approval for the UK FMD study was secured in 2023. Data entry is via an online portal to the FEIRI initiative to enable multi-site activation and collaboration. There are 50 datafields covering including demographics, clinical characteristics, family history, type of lesion, complications of FMD, interventions, optional biobanking for serum and genetic material.

Results: The study is open to all centres wishing to participate in the UK. 25 patients have been recruited thus far from the principal site. Mean age 56 years of age, 88% female. All barring one had multi-focal FMD. 16 showed multi-site arterial involvement. Four presented with TIAs, two hemorrhagic stroke, four cervical or carotid artery dissection at presentation. Three more sites within England and Scotland have been onboarded with four other centres in various stages of onboarding.

Conclusion: Unravelling the clinical characteristics, genetic and molecular basis of FMD will require large numbers of well characterized patients, which cannot be properly achieved based on small studies or single site contribution. The UK FMD study is at early stages of recruitment but baseline demographic data appears similar to that of large registries. The UK FMD study aims to join the international collective in a meaningful way on a national scale to assist with epidemiology, stratification according to different clinical presentations and geographic origins and provide an over-arching research resource to study this rare disease.

Poster number: 070

Submission number: 243

The dietitian's role in a national hepatocyte nuclear factor 1β (HNF1B) clinic

Mrs Angeline Taylor[1], Dr Coralie Bingham[2], Dr Rhian Clissold[2]

[1]Renal Nutrition Group, Exeter.
[2]Royal Devon University Healthcare NHS Foundation Trust, Exeter

Mrs Angeline Taylor

Biography
Angeline Taylor has been a registered dietitian for 15 years and worked within the kidney specialty for the past 12 years. Currently, Angeline holds the position of Renal Dietitian Team Lead in the NHS, Chair of the British Dietetic Association Renal Nutrition Group (RNG), and Renal Dietitian for Kidney Care UK's Kidney Kitchen. She also sits on the UK Kidney Association Sustainability committee and the UKKA and Kidney Care UK Information committee. She is extremely passionate and committed to supporting those with kidney conditions to live a healthy lifestyle, and advocates a plant-based approach to managing kidney disease. Angeline see patients with a variety of kidney conditions and at various stages of the disease, from early to advanced stages of chronic kidney disease, dialysis, kidney transplantation, as well as acute illness on a busy NHS ward.

Abstract

Introduction: HNF1B -associated disease is a rare genetic disorder due to either mutation in or deletion of the *HNF1B* gene on chromosome 17. This encodes a transcription factor involved in the development of the kidney, pancreas, liver and genital tract. As a result, affected individuals can present with a variety of clinical features as part of this multisystem disorder. Kidney involvement can include renal cysts, single kidney and biochemical abnormalities (hypomagnesaemia and hyperuricaemia); extra-renal features include young-onset diabetes mellitus, pancreatic hypoplasia, abnormal liver function tests and genital tract malformations. Neurodevelopmental disorders, such as autism spectrum disorder and learning difficulties, are also more common in those with a gene deletion.   We launched a national clinic for both children and adults with HNF1B-associated disease in May 2022; a dietitian is part of the multidisciplinary team. Our aim was to review the scope of this role within the adult service.

Methods: Patient data including demographics, renal function and clinical features were collected from May 2022 using our electronic patient record.   Information on dietetic referrals and interventions was also collected.

Results: 9 adult patients have been assessed to date; 7 were NHS referrals and 2 were referred from overseas (Germany and USA). Median age was 31 years (range 20-57) and 7 of 9 (77%) were female. 5 individuals had an *HNF1B* gene mutation whilst 4 had a deletion. Clinical features included:

- 3/9 (33%) had established chronic kidney disease (CKD, eGFR 33-46ml/min/1.73m^2), of which all had gene mutations
- 7/9 (77%) had early-onset diabetes, of which 4 were established on insulin and 2 were following a self-prescribed reduced carbohydrate diet to avoid insulin
- 1/9 (11%) had pancreatic insufficiency
- 1/9 (11%) had a history of gout
- 2/9 (22%), both with a gene deletion, had neurodevelopmental involvement.

8 patients agreed to dietitian input. 5 were given dietetic advice for diabetes management alone, two for both diabetes and CKD, and one for nutritional support due to a low BMI (12.8kg/m^2).

Discussion: Dietary advice for diabetes (with or without CKD) has been the most common dietetic intervention in the HNF1B clinic to date. However, the multisystem nature of this condition means dietetic advice may also be needed for gout, hyperkalaemia, hyperphosphatemia, secondary hyperparathyroidism, malnutrition, nutrition support, and pancreatic enzyme use.

Self-prescribed dietary restrictions can limit consumption of macro and micro nutrients, therefore dietetic education around unnecessary restriction may be needed.

Given the potential for neurodevelopmental involvement, guidance needs to be tailored to individual cognitive abilities and the patient's level of acceptance. Setting up the first national HNF1B clinic has highlighted the complexities that necessitate individualised dietetic assessment and guidance; the dietetic needs of people with HNF1B-associated disease cannot be met through online resources and input from a specialist dietitian is warranted.

Poster number: 071

Submission number: 254

Improving kidney-specific self-management knowledge and behaviours via a novel digital health intervention, 'My Kidneys & Me'

Dr Courtney Lightfoot[1,2], Ms Gurneet Sohansoha[1,2], Ms Ella Ford[1,2], Dr Noemi Vadaszy[1,2], Dr Thomas Wilkinson[1,2,3], Dr Matthew Graham-Brown[4,5], Prof Alice Smith[1,2]

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Dr Courtney Lightfoot

Biography
Courtney is a mixed methods researcher working with the Leicester Kidney Lifestyle Team. Her role involves the development, evaluation, and implementation of complex (digital) health interventions to support people with kidney disease to better (self-)manage their health and lifestyle behaviours. Her work focuses on helping people with kidney disease to live well by empowering them to take a more active role in their health and healthcare.

Abstract

Introduction: Patient awareness and understanding of chronic kidney disease (CKD) are critical aspects of successful disease management, but many people with CKD have limited knowledge of their condition, its management, and its consequences. We developed an educational self-management digital health intervention (DHI) called 'My Kidneys & Me' (MK&M) for people with CKD not requiring kidney replacement therapy. Aimed at supporting self-management, MK&M comprised theory-based education sessions and trackers for goals, symptoms, physical activity, and clinical measures. Here we present outcomes for CKD and self-management awareness, knowledge, and behaviours from a multicentre randomised control trial of MK&M.

Methods: Participants (n=420) aged ≥18 years with CKD stages 3-4 were recruited from 26 hospitals across England and randomised 2:1 to intervention (MK&M) (n=280) or control (n=140) groups. The CKD Self-Management Knowledge Tool questionnaire (CKD-SMKT) was administered at baseline and 20 weeks via an online survey. Knowledge of CKD and self-management behaviours was calculated as a percentage of correct responses to the 10-item CKD-SMKT. Participants indicated past performance of behaviours using a yes/no response. Awareness of kidney health was assessed by a single item on a 5-point Likert scale from "I know nothing" to "I know everything I need to know". Paired t-tests were used for within-group changes and linear regression models for between-group differences, adjusted for baseline values. Analyses were conducted using both intention-to-treat (ITT) and per-protocol (PP)

approaches. The PP analysis excluded participants who did not activate their MK&M account or who only logged in once.

Results: At baseline, 94% of participants correctly answered one or more CKD-SMKT item(s) and 88% were engaging with at least one self-management behaviour. At 20 weeks, 96% of participants correctly answered one or more CKD-SMKT item(s) and 89% were engaging with at least one self-management behaviour. Significant increases in the percentage of correct CKD-SMKT responses were observed for both MK&M (ITT: +7.7, P=0.004; PP: +7.7, P=0.019) and control (+6.8, P=0.041) groups, but no between-group were found (ITT: P=0.999; PP: P=0.925). Perceived kidney health awareness significantly improved in both MK&M (ITT: +0.5, P<0.001; PP: +0.6, P<0.001) and control (+0.3, P<0.001) groups; in ITT analysis, no between-group difference was found (P=0.089), but a significant between-group difference was observed (±0.3, P=0.029) for PP. A greater proportion of the intervention group reported improvements in kidney health knowledge compared to the control group at 20 weeks in both ITT (52% vs 35%, P=0.025) and PP analyses (54% vs 36% P=0.014). No differences in the number of self-reported self-management behaviours performed were observed between groups (ITT: P=0.190; PP: P=0.239).

Conclusion: Increased CKD awareness and knowledge were observed at 20 weeks in both groups, with greater improvements in the MK&M group. These results suggest that simply administering a CKD knowledge questionnaire at baseline may highlight own lack of understanding and awareness of CKD, and initiate self-directed learning even in those who did not receive access to MK&M. However, the MK&M group showed larger increases in CKD awareness and knowledge indicating that MK&M effectively supported their learning. Greater self-management knowledge, and engagement in self-management behaviours, are associated with better health outcomes, thus MK&M may improve CKD healthcare management.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

ISRCTN18314195

Poster number: 072

Submission number: 270

The PKD App: a co-developed information resource for patients newly diagnosed and at early stages of autosomal dominant polycystic kidney disease, and their families

Mrs Susan Muirhead[1], Ms Tess Harris[1], Dr Knut Schroeder[2]

[1]PKD Charity, London.
[2]Expert Self Care Ltd, Bristol

Mrs Susan Muirhead

Biography

Susan Muirhead joined PKD Charity in March 2019 as the Community Support Manager at the PKD Charity. Susan coordinates a programme of personalised, non-medical support services for individuals and families affected by PKD. These include online PKD Forums, nationwide telephone peer support; topic-based conference calls, webinars and meetups.

Abstract

Introduction: Autosomal Dominant Polycystic Kidney Disease (ADPKD) causes fluid-filled cysts in the kidneys and liver. This leads to various complications, such as genetic anxiety, hypertension, pain and kidney failure. Many newly diagnosed people go online for information and support but find it hard to get credible answers to their questions. As a result, people feel confused and anxious from conflicting information, 'scary images' and other people's comments.

Technological advances continue to shape healthcare, and mobile applications have emerged as useful information tools for patients and healthcare providers.

This study aims to evaluate the effectiveness and user satisfaction of a mobile information app (PKD App) that supports individuals with ADPKD in managing their condition and raises awareness of support provided by the PKD Charity and other organisations. The app offers credible PKD-related information in one place (derived from the PKD Charity's PIF TICK accredited information), practical tips and reassurance for everyday life, and links to trusted further information and available support.
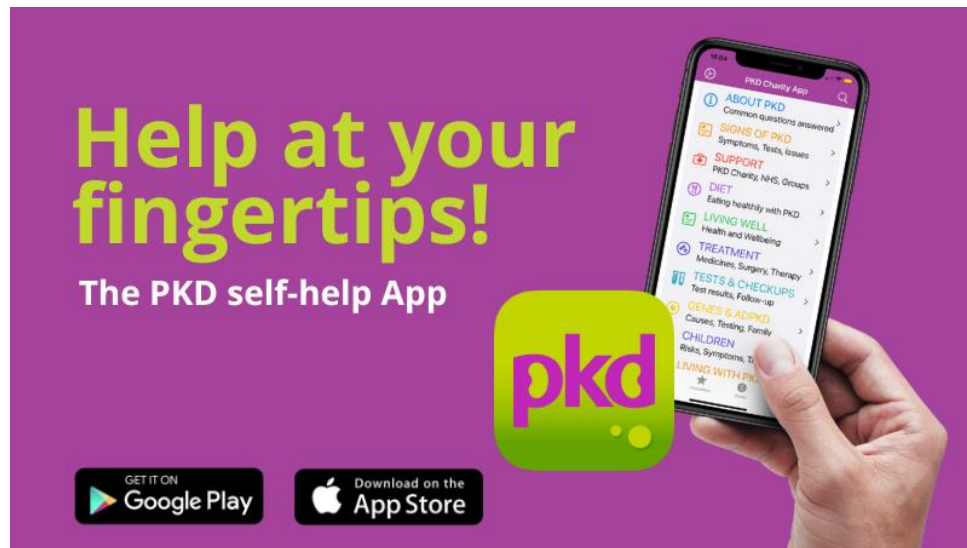
This small questionnaire survey gathered insights into the app's usability, impact on self-management, and overall user experience. To date (Jan 24), the app has been downloaded 858 times, with 16,075 page views.

Methods: This study used a mixed-methods approach to obtain quantitative and qualitative data through user questionnaires. We recruited participants who use the app from online PKD support groups and the PKD Charity community. The questionnaire consisted of closed-ended questions, utilizing Likert scales to measure user satisfaction and perceived effectiveness, and open-ended questions to gather qualitative feedback on specific features and overall impressions. The sample included 36 individuals diagnosed with ADPKD.
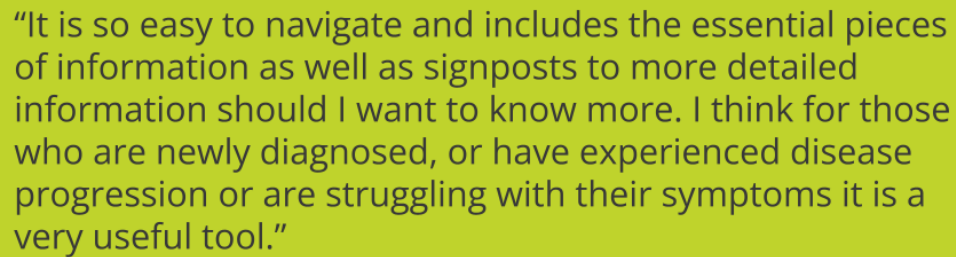
Results: Quantitative analysis revealed that participants found the PKD App user-friendly, relevant and well-designed (average score of 4.6 out of 5). When asked how easy the app is to navigate, participants scored an average of 4.6 out of 5 (CI 4.4 - 4.8). Users found the text easy to read and understand (mean score 4.6 out of 5, CI 4.4 - 4.8) and felt the app provided relevant information (mean score 4.4 out of 5, CI 4.1 to 4.7).

Fig. 1: The PKD app is easy to navigate and use - and provides relevant info in an appealing design (n=35)

1. Navigation: How easy is the app to navigate? — 4.63
2. Understanding: Is the text easy to read and unders — 4.63
3. Content: Does the app provide relevant info? — 4.43
4. Design: How visually appealing is it? — 4.49
5. User-friendliness: Did you find it easy to use? — 4.60
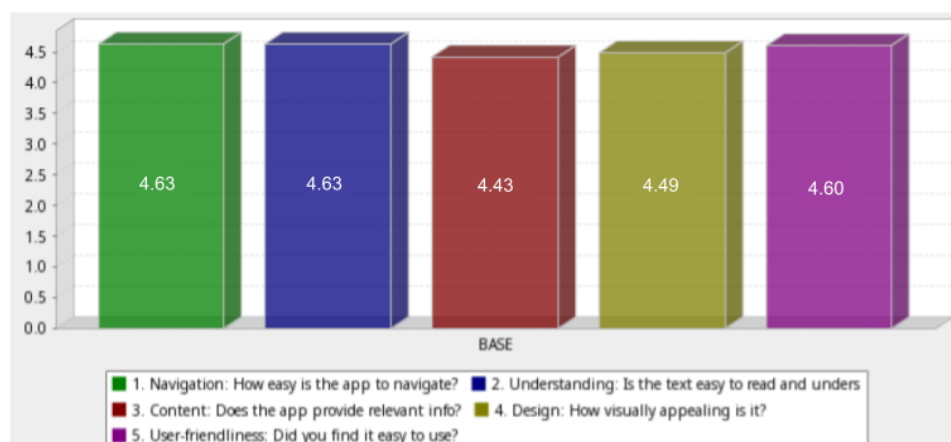
Qualitative analysis of open-ended responses highlighted the app's positive impact on users' sense of empowerment and self-efficacy in managing their ADPKD.

Fig. 2: Example of positive user feedback

"It is so easy to navigate and includes the essential pieces of information as well as signposts to more detailed information should I want to know more. I think for those who are newly diagnosed, or have experienced disease progression or are struggling with their symptoms it is a very useful tool."

Discussion: The findings of this small study suggest that the PKD App holds promise as a supportive tool for individuals managing ADPKD. The high level of user satisfaction emphasises the importance of tailoring digital health interventions to the specific needs of the target population. The positive feedback indicates the potential of health information apps to enhance self-management and patient education in kidney disease.

The study also reveals areas for improvement, including the need for enhanced local customisation options within the app.

In conclusion, this evaluation provides valuable early insights into the strengths and weaknesses of the PKD App, demonstrating its potential as a valuable tool in supporting individuals with ADPKD.

Poster number: 073

Submission number: 277

I remember feeling alone and isolated. There was no obvious place to find others who had been or were going through a similar experience.

Mrs Sharon Byrne, Amanda Bevin

East Kent Hospital University Foundation Trust, Kent

Mrs Sharon Byrne

Biography
Renal Counsellor for 8 years. Running the Support Group for this time too.

Abstract

Why hold a Support Group? Feedback above says it all. GIRFT recommends peer support is essential for "Gold Standard" of care. Nest 2015 argues it is a "key block to person-centred care" as it will connect individuals with comparable health conditions or experiences to offer each other emotional and practical support. Groves et al 2021 says "peer support is acknowledged as a way individuals can face, accept & overcome challenges arising from a stressful event".

Brunelli et al 2016 meta-analysis of studies into the effectiveness of groups highlighted six general outcome categories: psychosocial functioning, self-efficacy, quality of life, health status, health behaviours and health care use.

The most important thing- patients do not feel alone, they feel cared for, supported and are able to regain a sense of who they are when their world seems to be falling apart.

Method: Our support Group was set up in 2015 for patients/family members. Pre covid, this was bi-monthly, across two geographical areas to ensure equity of access for our patients, alternating dates to cater for dialysis shifts. Now, we hold hybrid meetings so those that want to meet in person can (community halls/ clubs) and others can join via zoom. A communication list was established to ensure that those that could not make the meetings could still access information shared.

Liaising with our Kidney Patient Association guaranteed funding for venues and help to co- facilitate the group.

Meetings are publicised via posters in all units, pop up posters at patient events, weekly MDT meetings. In-house staff training on the psychological aspects of patient care, we also promote the benefits of our Support Group.

At members requests, healthcare professionals are invited to provide a talk, e.g. PKD Charity, Dietitians, Utility Warehouse, Patient Involvement Team. This helps individuals to have a greater awareness about

their physical, psychological and social wellbeing and therefore eases anxiety. Impacting health care status/ behaviours/ use.

Results:

Communication list: 60 in 2016, 155 in 2023.

Feedback:

"It's comforting to know that I'm not alone in this journey and that there are others who understand the unique aspects of living with kidney-related issues" (psychosocial functioning/health status)

"I often feel very anxious not knowing what lies ahead. Knowing there is a support network is reassuring." (psychosocial functioning, self-efficacy)

"The shared experiences within the group helped me gain valuable insights into what to expect" (Psychosocial Functioning, Health Status)

There is always something new to learn from the group and it's not always medical! (Quality of Life)

the kidney support group has played a crucial role in my journey toward better health and well-being.(Health status, psychosocial functioning)

it's wonderful to see and hear people sharing their experiences, asking questions and wanting to know more about their illness and how they can navigate a way through it (healthcare behaviours)

Conclusion/ Discussion

Feedback illustrates some of Brunelli et al's general outcomes (as highlighted above) and Nest's 2015 proposal that people feel "knowledgeable, confident & happy, less isolated and alone"

More importantly, members say:

"is invaluable!"

"we made some great friends"

"not alone"

Our group provides a holding for our members when they need it most.

Going forward, we will continue to run hybrid meetings, and be responsive to our members and their needs. And continue to provide patient feedback to our MDT colleagues.

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Poster number: 074

Submission number: 300

Revitalising Patient Education and Support: The Impact of a Post-COVID Dialysis Roadshow in the UK

Dr Jyoti Baharani[1], Mrs Fiona Loud[2], Mrs Giuietta Whitemore[2]

[1]Heartlands Hospital, Birmingham. [2]Alton, Hampshire

Dr Jyoti Baharani

Biography
Consultant Nephrologist

Abstract

Introduction: Chronic kidney disease affects one in ten individuals in the UK, often leading to extended periods of dialysis as patients await transplants. Currently, nearly 30,000 people in the UK are undergoing dialysis, with our unit alone supporting over 600 of these patients. Of these, 25% perform dialysis at home, while an additional 400 are in the pre-dialysis stage. Adjusting to life with kidney disease and the rigor of dialysis is a profound change for patients. In-centre haemodialysis (ICHD) typically requires patients to visit a centre three times a week for sessions lasting up to four hours. Conversely, home dialysis offers eligible patients improved quality of life and freedom, eliminating the need for frequent travel and allowing dialysis in the comfort of their own homes.

To educate patients about their dialysis options, our unit has historically participated in dialysis roadshows, organized in collaboration with Kidney Care UK and industry partners. From 2016 to 2019, these roadshows provided crucial information and support for patients and families considering home dialysis. The format included interactive sessions, with camper vans and exhibitions in unit waiting areas and meeting rooms, offering a valuable platform for patients to engage with experts and explore home therapy options. After a hiatus due to COVID, we successfully held a 2-day roadshow in November 2023.

Methods: The planning of the event involved meticulous coordination between clinicians, Kidney Care UK, and industry partners, guided by a comprehensive checklist. Safety considerations were addressed through a dedicated health and safety plan. Promotional materials, designed by Kidney Care UK, were distributed through our unit. These included an A4 flyer, included in clinic letters, and posters displayed in clinic areas. To gauge the event's impact, we conducted surveys among patients and staff, while keeping a detailed register of attendees.

Results: The roadshow attracted 60 patient visitors, with a slightly higher turnout on the first day. Operating hours were from 10:00 to 16:00. Exhibits included demonstration machines and resources from Baxter and Fresenius, along with a Kidney Care UK information stand. Local patient peer supporters played a vital role, providing personal insights and experiences. Feedback from 22 patient surveys revealed significant benefits for those considering or already undergoing dialysis. Key suggestions for improvement included better amenities like parking and seating, and more networking

opportunities. Staff feedback, while generally positive, highlighted logistical challenges and the need for improved communication strategies. Industry partners expressed overwhelming support for the event.

Discussion: This roadshow marked the first of its kind in the UK post-COVID, demonstrating its immense value for patients at various stages of dialysis, renal staff, and industry partners. Encouraged by this success, Kidney Care UK plans to explore future events with partners.

Poster number: 075

Submission number: 308

Communicating health risk in chronic kidney disease: A scoping review

Miss Emma Caton[1], Ms Ros Aird[2], Ms Maria Da Silva-Gane[3], Dr Sivakumar Sridharan[1,3], Dr David Wellsted[1], Prof. Shivani Sharma[4], Prof. Ken Farrington[1,3]

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Miss Emma Caton

Biography
Emma is a PhD student and Research Assistant within the School of Life and Medical Sciences at the University of Hertfordshire. Having obtained her MSc in Health Psychology from King's College London in 2020, Emma's research interests include the management of long-term conditions such as chronic kidney disease and inflammatory arthritis.

Abstract

Background: Communicating risk is a key component of shared decision-making and is vital for the management of advanced chronic kidney disease (CKD). The use of risk prediction algorithms to estimate the risk of disease progression, mortality, and prognosis associated with renal replacement therapies has recently increased, without corresponding emphasis on how to use these tools to communicate risk to patients sensitively and effectively. There is little evidence to suggest how best to communicate health risk information to people living with CKD. The aim of this scoping review was to identify and understand the nature of evidence-based risk communication strategies for people living with CKD.

Methods: We searched MEDLINE, CINAHL and Scopus databases for articles which described or evaluated the use of risk communication strategies within either the renal or general population. Similar risk communication strategies were collated and summarised narratively.

Results: A total of 3700 sources were retrieved from the search, of which 46 were included in the review. Twenty-three studies reported primary research, and twenty-three reported secondary research either in the form of narrative or systematic reviews. Nine main risk communication strategies were identified: framing, absolute versus relative risk, natural frequencies versus percentages, personalised risk estimates, qualitative risk communication, best-case/worst-case framework, use of graphs and graphics, generic interaction skills, and managing uncertainty. Most articles within the shared decision-making literature highlight the importance of informing patients of health risks, however, most fail to elaborate on how effective risk communication can be achieved. There are very few risk communication strategies specific to the CKD population.

Conclusion: Specific strategies to improve health risk communication for patients living with CKD are lacking. There is a need to establish the informational and communication preferences for patients living with CKD to better understand how to best communicate health risk information to individuals in this population.

Poster number: 076

Submission number: 335

The road to digital dietary education for patients with type 2 diabetes and ckd

Ms. Angela Doherty[1], Mrs. Caroline Ferguson[2], Ms. Yuko Ishida[1]

[1]Adult Acute Dietetics Department, Glasgow. [2]Glasgow Renal and Transplant Unit, Glasgow

Ms. Angela Doherty

Biography
Has worked in Renal Dietetics since 2007, having spent 9 years working in Renal Dietetics in Guy's Hospital in London before moving to Glasgow in 2016 for a Team Lead Role.

Abstract

Introduction: Poor dietary choices are a well-known risk factor for the development and progression of Type 2 diabetes complications.[1] Dietary guidance works towards improving or maintaining glycaemic targets, achieving weight management goals, ensuring adequate but not excessive protein intake and improving cardiovascular risk factors e.g. blood pressure and lipids[2]. Dietary misinformation can lead to poor dietary knowledge and poor dietary choices. As the number of dietitians are small[3] in relation to growing patient numbers[4], access to a dietitian who can provide evidence-based, tailored dietary advice is limited. Our renal dietitians have produced a suite of asynchronous online kidney diet patient education videos, to support self-management which have been well received. However, at present we haven't developed any information about diet, diabetes and CKD. The aim of this project was to determine existing dietary education levels of our patients with chronic kidney disease (CKD) and diabetes, and assess the need for specific dietary information to be developed.

Method: A questionnaire was created by the renal dietitian and CKD specialist nurse to assess the level of dietary education patients had already received. This was distributed to patients with diabetes attending the CKD clinic by the CKD specialist nurse in early 2023. As numbers were small, basic statistical analysis methods were employed and results were collated.

Results: Twenty five patients completed the questionnaire (68% male, 32% female; 76% aged between 60-79 years). The majority (60%) had CKD stage 4 or CKD stage 5 (32%), with 76% having a primary renal diagnosis of diabetic nephropathy.

88% reported not following a specific diet for diabetes at present, and 80% of these patients reported they had never done so. 36% of patients reported that they never received or couldn't remember receiving any dietary advice for diabetes. Of those who had, 16% reported that it was more than 5 years since they received any dietary advice. Only 16% of the patients were required to follow renal related dietary restrictions. Sources of dietary information varied (see figure 1).
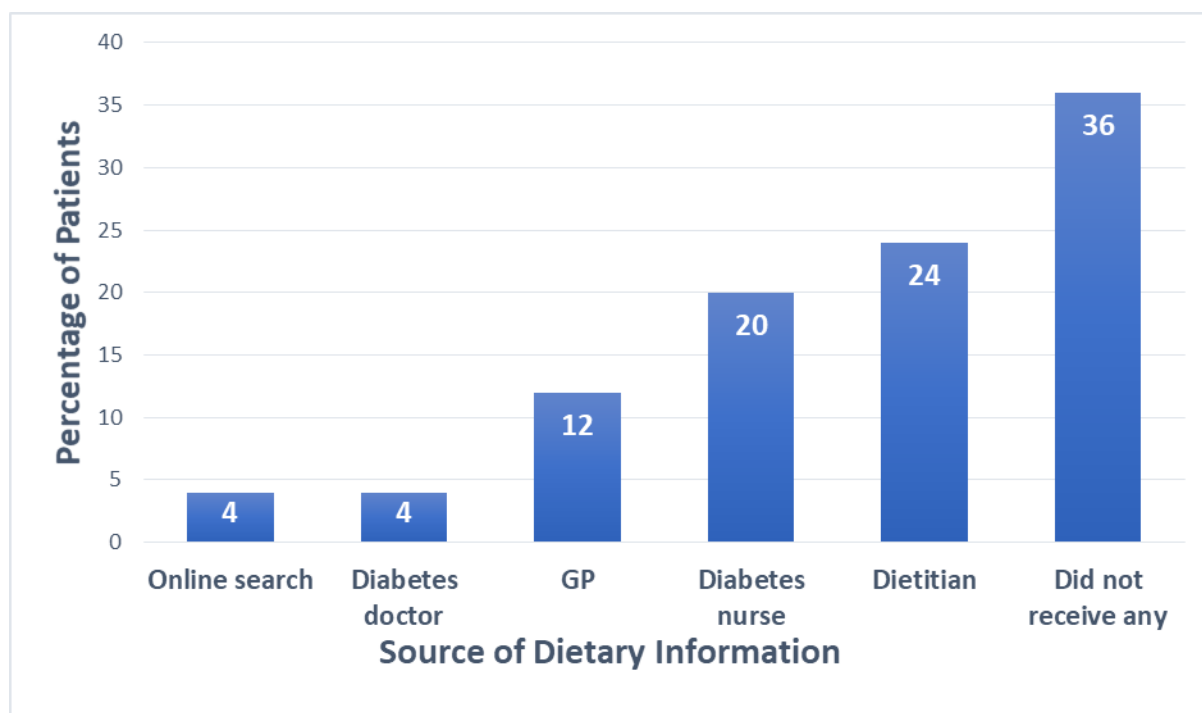
Figure 1. Source of dietary information received by patients.

Discussion: Despite a small number of patients surveyed, the majority were not following dietary advice for diabetes and seemed unsure of whether this had previously been discussed. The majority of patients also felt that a video containing dietary information would be useful. We have therefore proposed an asynchronous online patient education video as a solution for the lack of initial dietary advice and ongoing dietary monitoring and education, which has been funded. Once produced, further analysis to evaluate its effectiveness will be conducted.

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Poster number: 077

Submission number: 379

Developing shared decision making resources for women with kidney disease in relation to reproductive options, pregnancy planning and/or starting a family.

<u>Dr Leah Mc Laughlin</u>[1,2], Prof Jane Noyes[1], Prof Alice Smith[3], Dr Matthew Graham-Brown[3], Prof Sian Griffin[4]

[1]Bangor University, Bangor.
[2]Wales Kidney Research Unit, Cardiff.
[3]University of Leicester, Leicester.
[4]Cardiff and Vale University Health Board, Cardiff

Dr Leah Mc Laughlin

Biography
Hi I'm a healthcare scientist at Bangor University School of Medical and Health Sciences and the patient and public, outreach and capacity building lead for the Wales Kidney Research Unit. Interests include chronic conditions, treatment pathways, patient perspectives, organ donation and transplant, mixed methods and coproduction.

Abstract

Introduction: Recent research found that the needs and reproductive priorities of women are frequently overshadowed by their kidney disease. Women lack the knowledge, resources and opportunities to have high-quality conversations with their healthcare professionals. Decisions about planning or starting a family are highly personal and related to a number of health, social and cultural factors; individualized approaches to care are essential.(1) Despite general cultural and socioeconomic changes and an increase in options and choices for women who may or may not want to start a family, overtime very little has changed in the management and care of women with kidney disease in relation to their desires to have children.(2) We are aiming to develop new resources to ensure that women are able to make informed choices about pregnancy and alternate routes to becoming a parent.

Methods: This is a theory informed and evidence based resource using a co-productive and systematic approach, informed by established processes previously used to develop education and self-management programmes for people with kidney disease and diabetes.(3)   Theories in this research included the behaviour change Capability, Opportunity and Motivation COM-B model, mapped alongside the Theoretical Domains Framework (TDF) in order to establish what needs to happen and by whom in order to bring about shared-decision making in the clinical context for these women. An updated review of evidence based interventions to support shared decision making in kidney and related chronic conditions will support the adaption of guidance, resources, tools and mechanisms of support for this specific group and their very particular (unmet) needs. A muti-disciplinary group by expert and lived experience will contribute to the resource and include personal stories and experiences of pregnancy, and pregnancy planning, advice, guidance and signposting to trusted resources, alternate

options for pregnancy and overall reproductive health, and tools to help women and healthcare professionals start conversations about reproductive options, decision-making, pregnancy, post-natal care and parenting whilst living with kidney disease.

The resource will be embedded within the existing platform 'My Kidneys & Me' ensuring a cost effective approach with potential to reach maximum potential users in a time-efficient way and an embedded model to develop and add to the resource overtime.(4)

Results: The work is currently in development. Outcomes will be presented at the meeting.

Discussion: There are limited resources available for education and support for women's reproductive health within the context of kidney disease, and what is available does not address the highly personal decision making, multiplicity of options, heterogeneity of kidney disease in addition to cultural and social contexts—which are changing at pace particularly in a global context. This resource will work to address these unmet needs and help to set up the next stage of development which is to test the efficacy of the resources in a randomised controlled trial.

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Improving recipient and donor education in living kidney donation: Mapping educational needs through a rapid review

Tayler Truhan[1], Paul Gill[2], Holly Mansell[3], Helen Noble[1], Joanne Reid[1], Nicola Rosaasen[4], Alison Wood[5], Clare McKeaveney[1]

[1]Queen's University Belfast, Belfast, UK. [2]Northumbria University, Newcastle upon Tyne, UK. [3]University of Saskatchewan, Saskatoon, CA. [4]Saskatchewan Transplant Program, Saskatchewan Health Authority, Saskatoon, CA. [5]Queen Margaret University, Musselburgh, UK

Tayler Truhan

Biography

Dr. Tayler Truhan is a postdoctoral research fellow in the School of Nursing & Midwifery at Queen's University Belfast. She is working on the project, Using the ADAPT Guidance to Refine a Video Educational Series for Kidney Transplantation and living donation, supervised by Dr. Clare McKeaveney and funded by the Northern Ireland Kidney Research Fund. The project will result in an animated video education series co-produced with healthcare providers, kidney patients, and caregivers, which will be utilised by healthcare providers throughout Northern Ireland for patient education on kidney transplantation. Tayler completed her PhD in Psychology at QUB, and is broadly interested in personality and adversity/resilience, including coping with a chronic illness, and applied intervention work.

Abstract

Introduction: Living donor kidney transplantation (LDKT) is a complex medical procedure requiring extensive patient education for both donors and recipients. With technological advances in healthcare, video educational resources are becoming more widely used. Northern Ireland is one of the leading countries in LDKT, and it is therefore an essential component of patient education. The two aims for this rapid review are (1) to conduct an educational needs assessment of LDKT for prospective adult recipients and live donors, and (2) to inform video education materials surrounding LDKT currently being developed in Northern Ireland.

Methods: We conducted a rapid review of qualitative studies on the educational needs of adult living kidney donors and recipients. A literature search was undertaken across three databases from 2013-2023. Cochrane Rapid Reviews Methods Group guidance was utilised.

Results: Of the 1,802 references, 28 were eligible for inclusion. Qualitative data was analysed from 803 kidney patients/recipients, 512 living donors, 104 healthcare providers, and 102 family/friends. Regarding LDKT educational needs and preferences, six main themes were identified, including Diversity

and Inclusion, Early Delivery of LDKT Education, Group Education and Peer Support, Comprehensive and Clear Education, Importance and Influence of Family and Friends, and Communication Barriers.

Conclusion: In this rapid review, we discuss LDKT educational needs as indicated by over 1,500 individuals impacted by kidney transplantation. Findings provide a frame of reference for the development of future LDKT educational materials and will be implemented in a novel Northern Irish video educational series on kidney transplantation.

Poster number: 079

Submission number: 471

Health literacy status and its correlates among patients with Lupus nephritis

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Dr Cameron Bonthrone

Biography
Dr Cameron Bonthrone graduated from Cambridge University's School of Medicine in 2020 and completed his foundation training in the Severn Deanery thereafter. Driven by a passion for Nephrology, he completed a fellowship in Renal medicine and transplantation at the Royal London Hospital in August 2023 before pursuing his current role as an Undergraduate teaching fellow at the Bristol Royal Infirmary. He is currently applying to internal medicine training, ultimately with the goal of becoming a Nephrologist. He has a particular interest in teaching and the educational barriers that limit health.

Abstract

Introduction: Low health literacy (HL) is associated with worse outcomes across several health contexts. It has not been extensively studied in systemic lupus erythematosus (SLE), particularly in the United Kingdom. We sought to evaluate health literacy and its correlates in patients with lupus nephritis (LN) in a deprived area of East London.

Methods: Health literacy in patients with biopsy-proven LN was assessed. Patients were contacted via phone and with verbal consent completed two assessments of health literacy: the Brief Health Literacy Screening Tool (BRIEF), a validated self-assessment of general health literacy[1], and the Lupus Knowledge Assessment Test (LKAT), developed within Duke University Hospital to assess SLE specific knowledge[2]. Highest educational attainment, first language and demographic data were recorded. Electronic notes were reviewed to record biopsy class, date of diagnosis, eGFR (mls/min/1.73m^2) and urine protein:creatinine ratio (UPCR, mg/mmol) at diagnosis and 1 year. Univariate statistical analyses were applied to the results.

Results: 142 eligible patients were identified, 91 were successfully surveyed. 13 refused, 2 unable to take part and 36 were unsuccessfully contacted on two separate occasions. 48 patients (52.8%) spoke English as a first language and 72 patients (79.1%) belonged to a minority ethnic group, the majority being of South Asian ethnicity (38.5%) followed by Black (31.9%). 81 patients were female (89.0%). 42 patients (46.2%) attended higher education, 29 patients (31.9%) achieved A-level equivalent, 12 patients (13.2%) GCSE and 8 patients (8.8%) left pre-GCSE. Average age at diagnosis was 34.45 years with average length of diagnosis 8.42 years. Average eGFR at diagnosis and 1 year was 66.31 mls/min/1.73m^2 and 71.71 mls/min/1.73m^2 respectively while UPCR was 284.34 mg/mmol and 135.08 mg/mmol

respectively. Average LKAT score was 2.47 (maximum score 4) and 57 patients (62.64%) achieved 'adequate HL' according to the BRIEF.

Educational attainment and first language were not statistically linked (P = 0.1020). Performance on the BRIEF and LKAT were strongly correlated (P = 0.0001). Lower educational attainment was associated with lower BRIEF score (P = 0.0017) and lower LKAT score (P = 0.0089). Within both scores, attending higher education was the most significant factor for good health literacy on a pair-wise comparison. First language was not associated with performance on the BRIEF (P=0.0563) but was associated with LKAT score (P = 0.0421).

No markers of renal function were associated with BRIEF score. LKAT was found to be correlated with eGFR at 1 year (P=0.0456).

Conclusion: This study has identified that the general health literacy status of our patients is comparable to other SLE cohorts but they may have less SLE-specific knowledge with a lower LKAT score on average[2]. Education and first language were found to be significant correlates of health literacy, consistent with other research and attending higher education was the most significant factor for attaining adequate health literacy. LKAT and BRIEF were found to be effective tools at assessing health literacy and LKAT alone was found to be associated with health outcomes as measured by eGFR at 1 year.

Using this information, targeted intervention for patients with low HL may help to improve health outcomes in SLE patients with LN.

References:

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2. Maheswaranathan et al. Association of Health Literacy and Numeracy with Lupus Knowledge and the Creation of the Lupus Knowledge Asessment Test. J Rheumatol. 2022.

Understanding the impact of medication beliefs and illness perceptions on immunosuppression adherence in young adult kidney transplant recipients: a single-centre cohort study and comparative analysis

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Miss Rosie Heape

Biography
Rosie is a PhD student at King's College London. Her research focuses on medication adherence in kidney transplant recipients.

Abstract

Introduction:

Kidney transplantation (KT) is the treatment of choice for patients with End-Stage Kidney Disease (ESKD), as it is associated with improved quality-of-life and cost-effectiveness when compared to dialysis, regardless of age.

Young adult kidney transplant recipients (YKTR) have the highest rate of graft loss amongst transplant recipients in the UK and have been consistently identified as a high-risk group for immunosuppression (IS) non-adherence. YKTR face unique challenges, including transition from paediatric to adult care, social milestones and developmental brain changes, which have been shown to impact IS adherence. Importantly, IS non-adherence after a KT is a major risk factor for poor patient/graft outcomes.

Published research has focused on clinical and demographic predictors of non-adherence in YKTR. Psychological factors, including medication beliefs and illness perceptions, which are potentially amenable to change, have also been implicated. However, these factors are poorly understood and have not been fully interrogated.

The purpose of this study was twofold. First, to catalogue the prevalence of non-adherence in a cohort YKTR (aged 18-25 years) and investigate associations of non-adherence with psychological factors, including medication beliefs and illness perceptions. Second, to undertake a comparative analysis of findings in a cohort of KTR aged over 25 years.

Methods: YKTR attending clinic completed electronic self-report questionnaires between 24/11/2016-23/08/23. Adherence was measured using the Medication Adherence Report Scale (MARS-5). Participants with a total MARS score ≤24 were classed as non-adherent. Separate scores were generated for intentional non-adherence (≤19 over 4 items) and unintentional non-adherence (≤4 on one item).

Medication beliefs were measured using the Beliefs about Medicines Questionnaire-Specific (BMQ-Specific). Illness perceptions were measured using the Brief Illness Perception Questionnaire (BIPQ), adapted for YATR.

Analyses were conducted using Mann-Whitney U and t-tests i) within the YATR cohort ii) between YKTR and kidney transplant recipients (≥26 years) who completed the same questionnaire measures between 21/09/22-03/20/23.

Results:

N=35 YKTR completed questionnaires. N=9 (25.7%) were female and N=26 (74.3%) were male. Age ranged from 18.14-25.92 years (Mean=23.21, SD=2.22). N=24 (68.6%) participants were classed as non-adherent overall, N=23 (65.7%) unintentionally non-adherent and N=9 (25.7%) intentionally non-adherent. Intentionally non-adherent YATR reported significantly greater medication concerns, $t(33)=2.71$, $p=.005$, lower personal control, $t(33)=2.252$, $p=.031$ and lower treatment control, $Z=-2.61$, $p=.009$, compared with adherent YKTRs. Compared with the older KTR cohort aged 26 and over, YATR had significantly lower perceived consequences of the health of their transplant on their life, $Z=-2.670$, $p=.008$.

Discussion: Rates of overall non-adherence in our YKTR cohort are consistent with existing literature. Reported rates of intentional non-adherence were high. Importantly, we identified that medication beliefs and illness perceptions significantly affect IS adherence in YKTR. These psychological factors may be amenable to change through intervention. Reducing medication concerns and enhancing personal and treatment control may reduce intentional non-adherence. Additionally, perceptions of consequences may be a specific intervention target for YKTR. Further research to design and implement tailored interventions, considering the unique challenges faced by YKTR is essential.

Poster number: 081

Submission number: 462

Prevalence of asymptomatic urinary leptospira carriage in a high-risk CKD population

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Mr Ali M. Al-Rashed

Biography
Final year PhD Student in renal medicine and infectious diseases at the Department of Renal Medicine, Royal Free Hospital, UCL. For the past several years I've looked at the possible association between infectious pathogens and CKD of unknown aetiology, using molecular, serological, next-generation sequencing and bioinformatic techniques. I pursued several avenues of research to identify the presence of known and/or unknown pathogens in a high-risk CKD population in a low-income setting. This meant developing and optimising wet-lab and bioinformatic protocols to achieve specific objectives tailored for my project.

Abstract

Introduction: Leptospirosis is a bacterial zoonosis with a range of clinical manifestations including acute kidney injury. Chronic carriage of Leptospira has been associated with progression to CKD in several animal species but it remains unclear whether chronic carriage and/or CKD progression occurs in humans. An infectious cause such as leptospirosis has also been proposed as a cause of CKD of unknown aetiology, one form of which is Mesoamerican Nephropathy (MeN), which mostly affects young adults.

Determining the burden of asymptomatic leptospiral infection is challenging as serological assays may not be sensitive to antibodies against all serovars and immunity may wane over time. We therefore explored the evidence for asymptomatic carriage of urinary Leptospira in a young adult population at high-risk of CKD.

Methods: Samples were analysed at multiple timepoints per individual from a community-based, longitudinal study of apparently healthy young adults (mean age = 24.4, mean baseline eGFR= 107.9 ml/min/1.73m^2, % male = 94.3) from rural north-west Nicaragua followed-up annually for 7 years. Using a commercial ELISA kit and an optimised 16s nested-qPCR method, the presence of serum anti-Leptospira IgG antibodies and urinary leptospiral DNA was examined in 70 participants. All qPCR positive samples were sequenced to confirm leptospiral species.

Results: None of the participants had recent symptoms of severe acute leptospiral illness. In total, 35/70 (50%) had evidence of leptospiral exposure based on either a positive 16s nested-qPCR or an ELISA test, or both at any timepoint. Urinary leptospiral DNA was observed in 13/70 (18.6%) individuals by qPCR testing followed by confirmation by sequencing at least one timepoint. At any timepoint, 23/70 (32.9%) individuals tested positive for IgG however, only 8 of participants tested IgG positive at the time of a urinary qPCR test.

		16s Nested-qPCR	
		Pos	Neg
IgG Serology at time of urine sample	Pos	1	7
	Neg	12	50

Discussion: This study provides evidence that asymptomatic urinary Leptospira carriage occurs in this study population which is a relevant finding given this is a young population living in a rural, low-income setting at high-risk of subsequently developing CKD. Further work is needed to establish if there is any association between chronic urinary Leptospira carriage and kidney injury/disease in humans. Serological assays do not reliably identify Leptospira carriage and may not be broad or sensitive enough to detect antibodies against all serovars.

What does renal death mean for patients on kidney replacement therapy?

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Dr Retha Steenkamp

Biography
Retha Steenkamp is the Head of Operations and a senior statistician at the UK Renal Registry (UKRR), part of the UK Kidney Association. She has been working for the UKKR for many years and undertook a part time PhD, receiving a doctorate in Medical Statistics from the University of Bristol on 'Multiple imputation of missing data and prognostic survival modelling for incident patients starting dialysis'. Her research interests include survival modelling for kidney replacement patients (KRT), prognostic modelling using flexible parametric models, comorbid conditions and the effect on outcomes for KRT patients and linkage of datasets with UKRR data to better understand patient pathways, outcomes and healthcare utilisation. She is involved in many renal studies in the UK and is currently completing a project on kidney patient causes of death, comorbidity comparisons between UKRR and administrative data and changes in dialysis modality use due to Covid 19.

Abstract

Introduction: Causes of death (COD) for patients on kidney replacement therapy (KRT) have been reported in the UK Kidney Association annual report for many years, but due to a high proportion of missing data (38%), a high proportion of Other not specified (18%) and uncertain causes in some kidney centres (up to 63%), the true proportion of COD in the UK are unknown. This study aims to address the lack of data by i) comparing COD in UK Renal Registry (UKRR) data to Civil Registration (CR) records and ii) gaining a full understanding of COD for KRT patients using data from CR records.

Methods: Prevalent patients on KRT on 31/12/2020 in England and Wales followed-up for 1 year, who died in 2021, were included in the analyses. COD reported by centres to the UKRR were compared with the primary COD (ICD-10 codes) from CR records. The kappa statistic was used to compare agreement between UKRR and CR COD and Chi-squared tests for differences between groups. COD were analysed by treatment modality, age group and gender.

Results: Among 5,721 prevalent KRT patient deaths in 2021, 3,837 patients had COD in UKRR data and 3,675 in both UKRR and CR. Kappa agreement was fair (0.2-0.4) for cerebrovascular and cardiac disease, infections and malignancy, and slight for other COD.

Amongst primary COD, the reported percentages were generally higher in CR compared to UKRR data: other (36.2% vs 24.7%), cardiac disease (20.4% vs 18.2%), malignancy (11.8% vs 6.8%), cerebrovascular disease (3.9% vs 2.5%); infections were similar (27.8% vs 28.3%). Uncertain COD in UKRR data was mostly recorded as cardiac disease, death from diabetic complications, infections and malignancy in CR (figure 1). Treatment withdrawal as COD in UKRR data was mostly recorded as death from diabetic complications, dialysis/renal failure and malignancy in CR (figure 2). Missing causes of death in UKRR data was mostly recorded as deaths from COVID-19 infections, ischaemic heart disease, malignancy and diabetic complications (figure 3).

There were more deaths due to accidents in younger age groups; in older age groups more deaths due to cardio-vascular, chronic lung disease, dialysis and renal failure. Compared to males, deaths in females due to ischaemic heart disease was lower (10.2% vs 15.9%) and deaths due to diabetic complications higher (13.5% vs 9.6%). Compared to dialysis patients, deaths in transplant patients due to malignancy were higher and lower for ischaemic heart disease, diabetic complications, and dialysis/renal failure deaths.

Discussion: Among prevalent patients there was fair to slight agreement between COD reported to the UKRR and CR records. Specific COD were identified for most of missing, uncertain and Other unspecified COD in UKRR data, resulting in higher than previously reported proportions of patient deaths from malignancy and cardiac disease. There were differences identified in COD between males and females, age groups and treatment modalities. We have shown that COD from CR records can be successfully used to augment UKRR COD, however treatment withdrawal, an important COD, is not easily identified from CR records.

Figure 1 UKRR cause death of Uncertain compared to Civil Registration records, in adult prevalent patients on KRT on 31/12/2020 followed-up in 2021
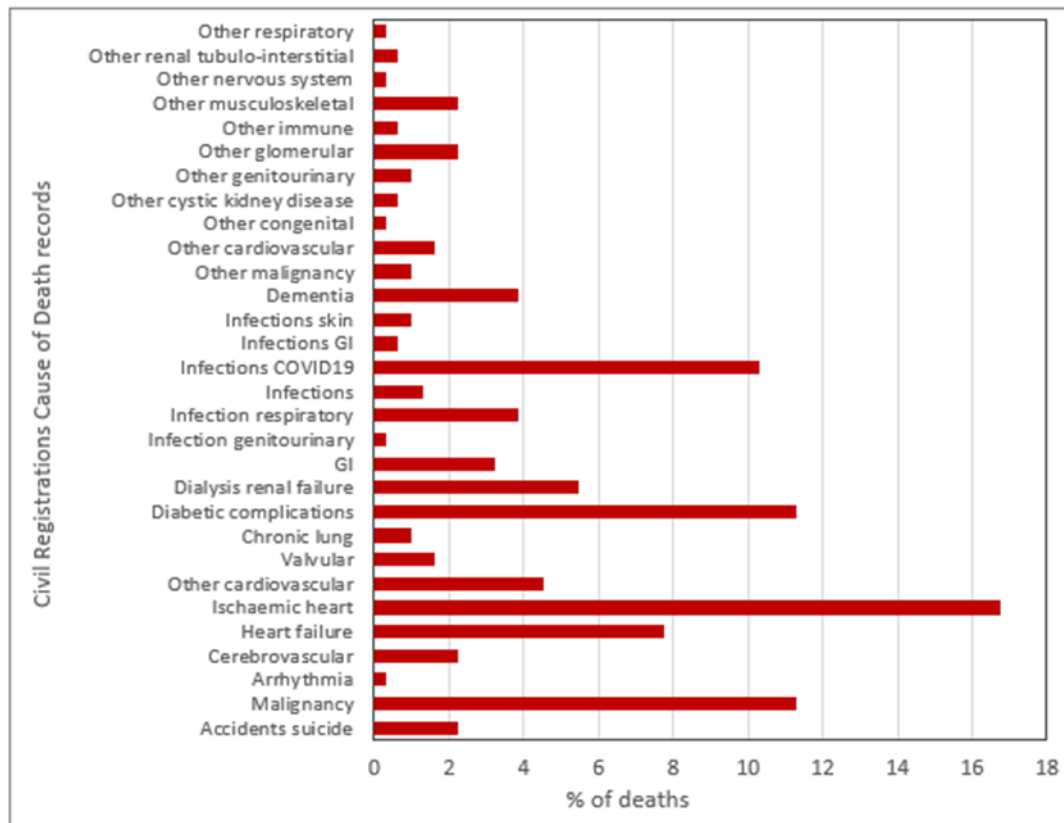
Figure 2 UKRR cause of death Treatment Withdrawal compared to Civil Registration records, in adult prevalent patients on KRT on 31/12/2020 followed-up in 2021
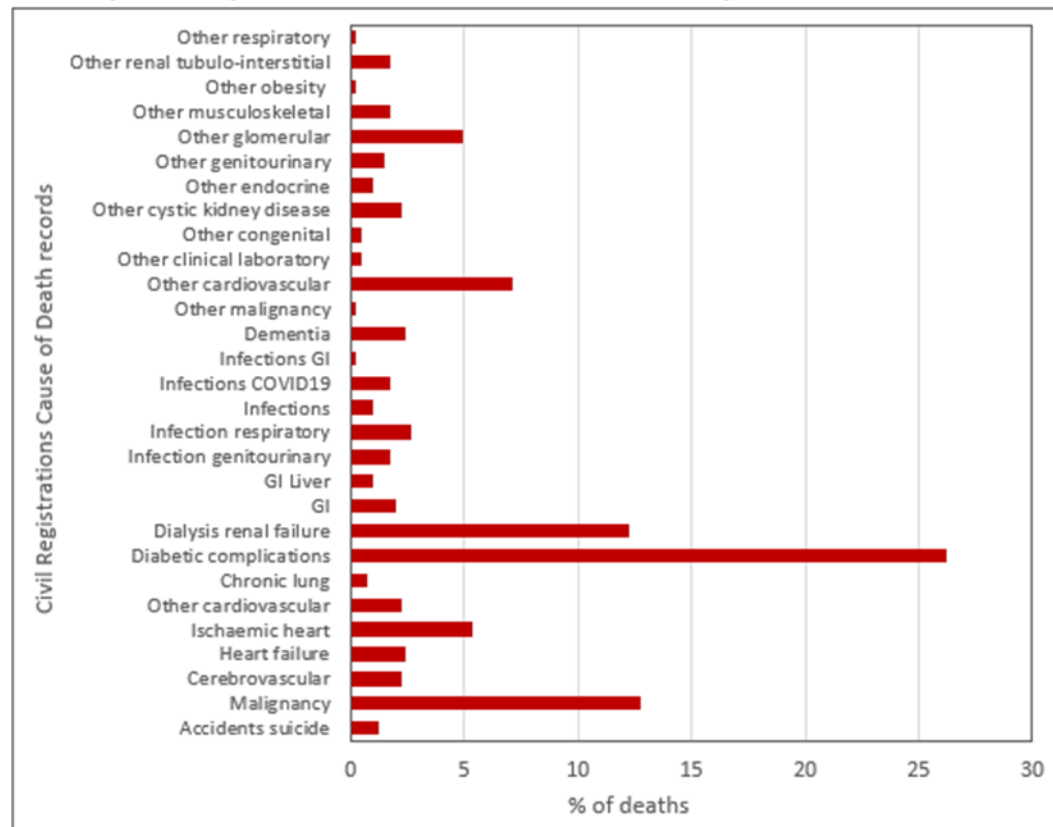
Figure 3 UKRR missing data for cause of death compared to Civil Registration records, in adult prevalent patients on KRT on 31/12/2020 followed-up in 2021
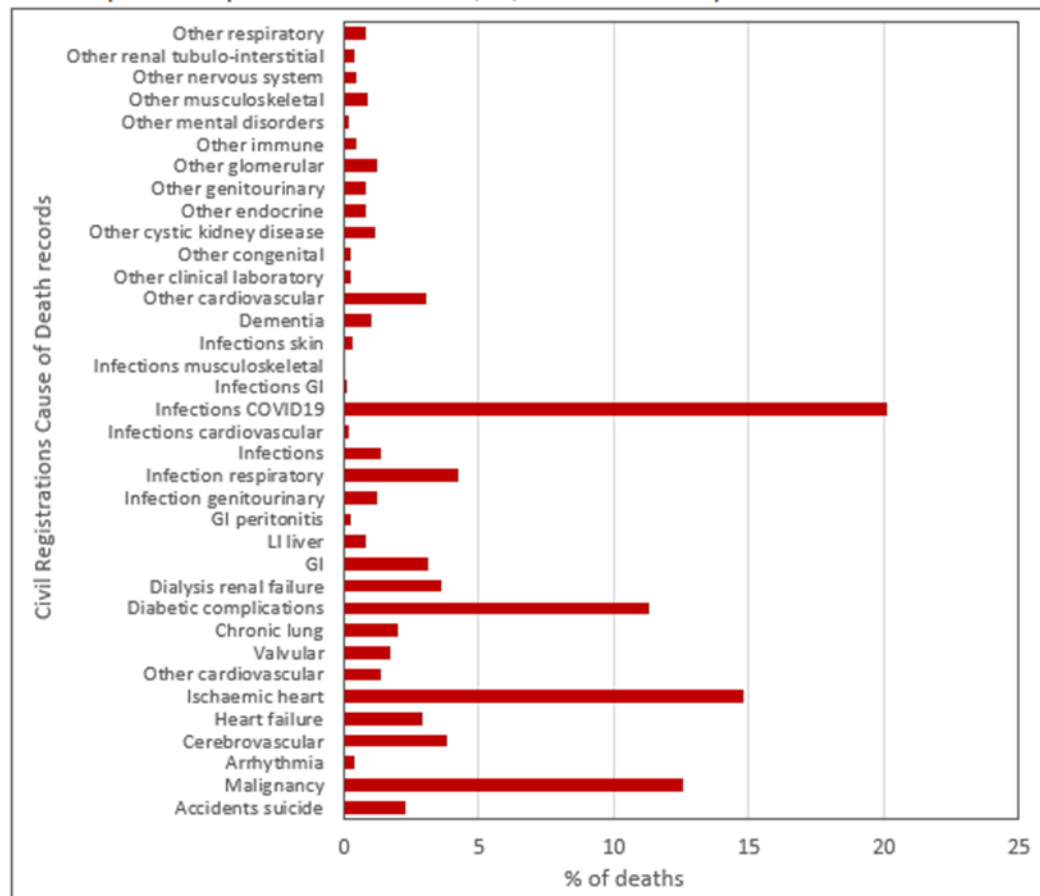
Poster number: 083

Submission number: 508

Humoral Response to COVID Vaccine and Infection is Intact During Sibeprenlimab Treatment of IgAN: Data From the ENVISION Trial

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Kieran McCafferty

Biography
Kieran McCafferty is a Consultant Nephrologist at Barts Health NHS Trust and Senior Lecturer and Queen Mary University London. His main clinical interests are diabetic kidney disease and haemodialysis. His basic science research interests are in the field of uraemic cardiovascular disease and cardiovascular protection. However he spends most of his research time developing and delivering clinical trials at both a local and national level. He has a passion for clinical trial delivery having lead on over 40 NIHR clinical trial sin the last 5 years. He is the renal clinical trials lead for Barts Health and the Diabetic Kidney disease Centre, and is the divisional director of research for specialist medicine at Barts Health and the deputy clinical director of R+D in the trust. To help deliver patients focused research across the UK he is the vice chair of the City and East London Ethics committee as well as the North Thames NIHR renal lead and deputy NIHR renal lead.

Abstract

Introduction: In the Phase 2 placebo-controlled ENVISION trial, the APRIL (A Proliferation Inducing Ligand) inhibitor sibeprenlimab significantly decreased proteinuria and stabilized estimated glomerular filtration rate decline in patients with immunoglobulin A nephropathy (IgAN).[1] A substudy was conducted to evaluate the humoral response to SARS-CoV-2 mRNA vaccination and infection. Reported is the unblinded analysis of COVID outcomes in the overall and substudy populations of ENVISION.

Methods: Patients enrolled in ENVISION (NCT04287985) received 12 monthly intravenous infusions of sibeprenlimab (2, 4, or 8 mg/kg) or placebo and were followed for 16 months after first dose of study drug. Recognized COVID infection (reported as an adverse event [AE]) and vaccination data were recorded for all patients. For patients in the substudy, serum antibody responses to SARS-CoV-2 spike and nucleocapsid proteins were measured monthly using validated Meso Scale Discovery V-PLEX SARS-CoV-2 Panel 24 multiplex assay. Vaccine responses among those who received a primary two-dose mRNA COVID vaccine series, with no recent or concurrent COVID infection, were evaluated. Peak post-vaccine serum SARS-CoV-2 receptor-binding domain (RBD) immunoglobulin G (IgG) titers were reported in World Health Organization binding antibody units (BAU)/mL. Slopes of RBD IgG decline curves were

used to generate estimates of time above protective threshold of 300 BAU/mL. Welch's two-sample t-test was applied to log-transformed peak RBD titers for significance testing. COVID infection–induced antibody responses and severity of COVID symptoms were assessed. In substudy patients, retrospective serologic diagnosis of COVID infection was established when simultaneous elevation of nucleocapsid and spike antibody titers, unexplained by vaccine history, was observed.

Results: Among 155 patients who received sibeprenlimab (n=117) or placebo (n=38), 56 (36.1%) had COVID infection reported as an AE during the study (**Table 1**). Overall, proportionally fewer sibeprenlimab recipients (33.3%) had a reported COVID AE compared with placebo recipients (44.7%). Two patients (one each in the sibeprenlimab and placebo groups) were hospitalized with serious COVID AEs in accordance with local management protocols; none admitted to intensive care or mechanically ventilated and there were no COVID-related deaths. The majority of COVID AEs were mild severity, regardless of treatment/dosing arm. In the serology substudy (n=74), symptomatic COVID (reported as an AE) occurred in 47.3% of patients. With the addition of serologic diagnoses (in the absence of AEs), the overall rate of COVID infection increased to 68.9%. Asymptomatic COVID was identified in 1 of 15 (6.7%) placebo recipients versus 15 of 36 (41.7%) sibeprenlimab recipients, raising the possibility that patients treated with sibeprenlimab may have had attenuated symptom presentation compared with patients who received placebo.

COVID seroconversion rates were 100% and peak RBD IgG antibody titers following primary mRNA vaccination exceeded the protective threshold of 300 BAU/mL in all patients (**Fig 1a**), with higher geometric mean peak titers in placebo (4,670 BAU/mL) compared with sibeprenlimab (1,700 BAU/mL) recipients (p=0.005). The rate of decline of peak RBD IgG titers after mRNA vaccination (in patients with ≥1 dose without confounding subsequent vaccination or infection) was similar between groups (**Fig 1b**), with modeled time above the 300 BAU/mL threshold of 192 and 174 days in the sibeprenlimab and placebo groups, respectively.

Discussion: COVID-specific antibody responses to vaccination or infection were preserved in patients with IgAN treated with sibeprenlimab. The possibility that COVID symptom presentation may have been modulated by sibeprenlimab warrants further investigation.

Table 1: COVID Diagnoses and Severity (by AE reporting) and Serologic Diagnosis of COVID Infection

Study Cohort	Sibeprenlimab (2 mg/kg)	Sibeprenlimab (4 mg/kg)	Sibeprenlimab (8 mg/kg)	Sibeprenlimab All patients	Placebo
Entire Study	**n=38**	**n=41**	**n=38**	**n=117**	**n=38**
Any COVID AE, n (%)[a]	11 (28.9)	12 (29.3)	16 (42.1)	39 (33.3)	17 (44.7)
Mild	10 (26.3)	12 (29.3)	13 (34.2)	35 (29.9)	16 (42.1)
Moderate	0	0	3 (7.9)	3 (2.6)	1[d] (2.6)
Severe	1[d] (2.6)	0	0	1 (0.9)	0
Serology Substudy	**n=22**	**n=19**	**n=13**	**n=54**	**n=20**
Any COVID AE, n (%)[a]	8 (36.4)	5 (26.3)	8 (61.5)	21 (38.9)	14 (70.0)
Mild	7 (31.8)	5 (26.3)	7 (53.8)	19 (35.2)	13 (65.0)
Moderate	0	0	1[d] (7.7)	1 (1.9)	1[d] (5.0)
Severe	1[d] (4.5)	0	0	1 (1.9)	0
Asymptomatic, n (%)[b]	6 (27.3)	7 (36.8)	2 (15.4)	15 (27.8)	1 (5.0)
Any COVID diagnosis, n (%)[c]	14 (63.6)	12 (63.2)	10 (76.9)	36 (66.7)	15 (75.0)

[a]Patients with two events were counted only once, with greatest severity recorded.
[b]Retrospective serologic diagnosis, not reported as an AE.
[c]Includes AE and serologic diagnoses (possible for substudy participants only).
[d]Categorized as an SAE.
AE, adverse event; SAE, serious adverse event.
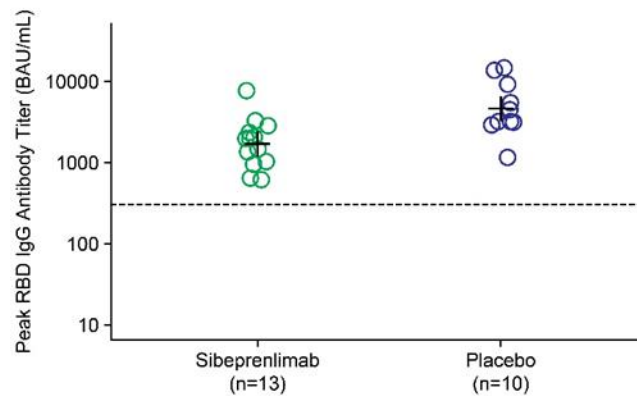
Figure 1a: Peak IgG levels specific to SARS-CoV-2 receptor binding domain of envelope protein (RBD IgG) following primary (two-dose) mRNA vaccination. The geometric mean maximum serum concentration was 1,700 BAU/mL for patients treated with sibeprenlimab (pooled 2, 4, and 8 mg/kg dose levels) versus 4,670 BAU/mL for patients who received placebo (p=0.005). The dashed line indicates 300 BAU/mL, a previously estimated Day-29 post-vaccination RBD BAU/mL level with ~90% vaccine efficacy.[2] Crosses indicate geometric mean. BAU, binding antibody units; IgG, immunoglobulin G; RBD, receptor binding domain.
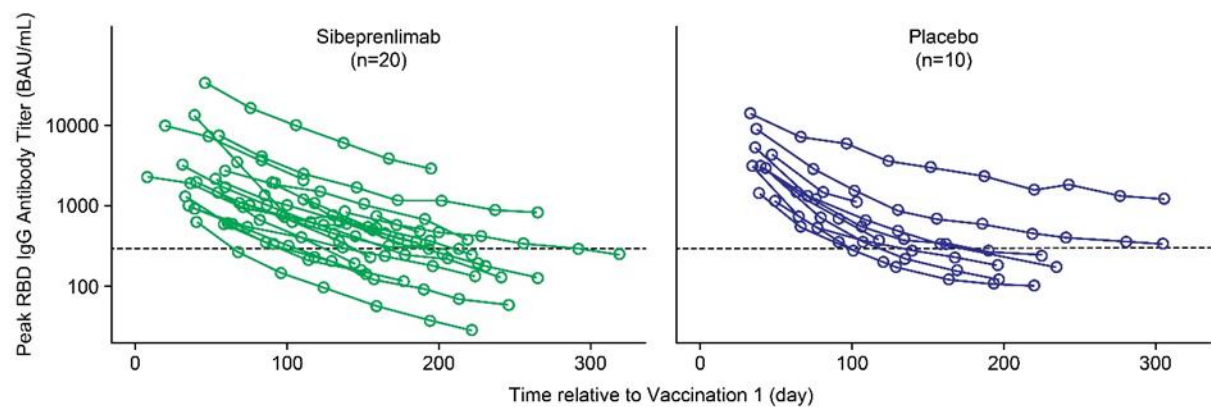
Figure 1b: Decline of RBD IgG antibody titers in sibeprenlimab (pooled 2, 4, and 8 mg/kg dose levels) and placebo recipients following mRNA vaccination (Day 0). Time above the protective threshold titer (300 BAU/mL; dashed line) was consistent between the sibeprenlimab and placebo groups (geometric mean: 192 days, sibeprenlimab; 174 days, placebo). BAU, binding antibody units; IgG, immunoglobulin G; RBD, receptor binding domain.

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Case ascertainment of renal failure and kidney impairment in secondary care and audit datasets in England: a cross-sectional study using electronic health data

Mr Patrick Bidulka[1,2], Mr Rob Konstant-Hambling[3,2], Dr Clive Weston[4,2], Professor Mark de Belder[5,2], Dr Shalini Santhakumaran[6,2], Dr Retha Steenkamp[6,2], Professor David Adlam[7,2], Professor Dorothea Nitsch[1,2]

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Mr Patrick Bidulka

Biography
Patrick Bidulka is a research fellow and PhD candidate at the London School of Hygiene & Tropical Medicine (LSHTM). His research focuses on exploring how we can use routinely collected health data to investigate comparative treatment effects where we lack randomised evidence. His main area of focus is studying acute myocardial infarction (AMI) treatment variation across hospitals in England, and how this variation can be used to conduct natural experiments to compare treatment effects. He has published several papers describing treatment variation and disparities for people with kidney impairment, and how to optimise the ascertainment of cardiovascular- and kidney-related outcomes using routinely collected health data in England. Patrick also teaches MSc Epidemiology and Health Data Science students and leads the Health Data Research-UK Black Internship programme at the LSHTM.

Mr Rob Konstant-Hambling

Biography
Rob Konstant-Hambling started his NHS career as a Clinical Cytogeneticist followed by a year in Pharma before returning to the NHS in a Business Intelligence role. Supporting Specialised Commissioning in its various configurations since 2006 he has worked at local, Regional and National levels. Working across the full portfolio of Specialised Services Rob has supported finance, planning, service transformation, public health and policy development and he has recently specialised in patient pathway analysis and patient flows, travel time modelling and queueing theory. Rob's analytical work on the relationship between frailty and outcomes has contributed to publications in the medical literature. His current studies include Event Simulation, Machine Learning and Analytics for Epidemiology.

Abstract

Introduction: Chronic kidney disease (CKD) is a progressive disease that can ultimately lead to chronic kidney failure. Kidney disease management shifts from primary care to tertiary care clinics through disease progression, and patients are managed by several other specialities, including cardiology. Case ascertainment of cardiovascular outcomes improves when using multiple linked data sources due to the fragmented care patients receive (1, 2). It is unknown to what degree case ascertainment of kidney outcomes improves using linked data sources in England. This study aimed to investigate the agreement between chronic renal failure diagnosis codes, and CKD status, between secondary care and audit datasets in England.

Methods: We calculated the agreement between chronic renal failure recorded between 2017-2022 in the Myocardial Ischaemia National Audit Project (MINAP) and (i) the United Kingdom Renal Registry (UKRR) and (ii) the Secondary Uses Services (SUS). Renal failure was coded as chronic renal failure diagnosis prior to admission with acute coronary syndrome (ACS) (creatinine chronically >200micromol/L) (MINAP), record of renal replacement therapy (UKRR), and CKD diagnosis (stages 3-5) using International Classification of Diseases – 10th Edition (ICD-10) codes (SUS). All records were temporally matched on admission dates (MINAP and SUS) or quarterly period (MINAP and UKRR).

We used the same linked data from MINAP and SUS to calculate the agreement between CKD case ascertainment (stages 3-5), derived from serum creatinine measures recorded at the time of an ACS hospitalisation (MINAP) and ICD-10 codes (SUS). In MINAP data, we categorised estimated glomerular filtration rate (eGFR) stages 1-2 as "no CKD" and eGFR stages 3-5 as "CKD". In SUS data, we categorised no CKD code, and stages 1-2 codes together as "no CKD" and CKD stages 3-5 codes and other chronic renal failure or kidney disease codes as "CKD".

Kappa statistics were used to quantify agreement, with values of <0.4, 0.4 to <0.75, and 0.75-1 indicating poor, moderate, and good agreement, respectively.

Results: Of the 484,131 ACS hospitalisations captured in MINAP, 8,878 (1.8%) also had a temporally matched renal failure record in UKRR and 26,610 (5.5%) had a temporally matched CKD diagnosis in SUS (**Table 1**). Of 34,021 events coded for chronic renal failure in MINAP, 6,064 (17.8%) corresponded to a renal replacement therapy record in UKRR (8.2% on haemodialysis, 1.1% on peritoneal dialysis, 2.1% having a kidney transplant, and 6.4% having another type of kidney failure), and 14,572 (43.8%) corresponded to a CKD diagnosis in SUS. Agreement was poor (MINAP versus UKRR) and moderate (MINAP versus SUS).

When comparing CKD case ascertainment in SUS vs MINAP (**Table 2**), we found that 32% of people in MINAP with an eGFR indicating CKD also had a code indicating CKD in SUS. There were almost three times as many CKD cases ascertained using the admission serum creatinine in MINAP as compared to using ICD-10 diagnoses in SUS. Agreement was poor between the two datasets.

Discussion: Using linked secondary care and renal and cardiovascular audit data improves the ascertainment of renal failure and CKD in epidemiological studies in England. The poor to moderate agreement in chronic renal failure and CKD status between MINAP, UKRR, and SUS is likely due to factors such as an acutely increased serum creatinine during ACS and differing purposes for data collection.

Table 1: Agreement between coded renal failure in the Myocardial Ischaemia National Audit Project (MINAP) versus UK Renal Registry (UKRR) and versus Secondary Uses Services (SUS), n (col %) unless otherwise specified.

	MINAP coded renal failure			
	No[1]	Yes	Total	Kappa agreement statistic (SE)
UKRR coded renal replacement therapy				
No record in UKRR	447,296 (99.4)	27,957 (82.2)	475,253 (98.2)	-
Record in UKRR	2,814 (0.6)	6,064 (17.8)	8,878 (1.8)	0.26 (0.001)
Haemodialysis	637 (0.1)	2,800 (8.2)	3,437 (0.7)	-
Peritoneal dialysis	115 (0.0)	382 (1.1)	497 (0.1)	-
Transplant	555 (0.1)	713 (2.1)	1,268 (0.3)	-
Other non-RRT[2]	1,507 (0.3)	2,169 (6.4)	3,676 (0.8)	-
Total	450,110 (100)	34,021 (100)	484,131 (100)	-
SUS coded kidney disease				
No diagnosis in SUS	438,072 (97.3)	19,449 (57.2)	457,521 (94.5)	-
Diagnosis in SUS	12,038 (2.7)	14,572 (42.8)	26,610 (5.5)	0.45 (0.001)
CKD, stage 3 (N18.3)	9,213 (2.0)	7,623 (22.4)	16,836 (3.5)	-
CKD, stage 4 (N18.4)	1,640 (0.4)	2,776 (8.2)	4,416 (0.9)	-
CKD, stage 5 (N18.5)	1,185 (0.3)	4,173 (15.3)	5,358 (1.1)	-
Total	450,110 (100)	34,021 (100)	484,131 (100)	-

[1]People with "unknown" (n=11,335) and missing values (n=50,729) in the coded renal failure variable in MINAP have been grouped with people recorded as not having coded renal failure (n=388,046)

[2]Other non-renal replacement therapy (non-RRT) includes people recorded in the UKRR with chronic kidney disease (CKD), acute dialysis, or patients who have recovered or stopped dialysis treatment.

Table 2: Agreement between chronic kidney disease (CKD) stage coded in Secondary Uses Services (SUS) versus estimated glomerular filtration rate stage (eGFR stage) at acute coronary syndrome (ACS) recorded in the Myocardial Ischaemia National Audit Project (MINAP), n (row %) unless otherwise specified.

	SUS coded CKD stage[1]			
MINAP coded eGFR stage[2]	No CKD code or Stages 1-2	Stages 3-5, or other chronic renal failure or kidney disease	Total	Kappa agreement statistic (SE)
Stages 1-2	337,938 (98.0)	6,841 (2.0)	344,779 (100)	-
Stages 3-5	76,156 (67.6)	36,459 (32.4)	112,615 (100)	-
Total	414,094 (90.5)	43,300 (9.5)	457,394 (100)	0.38 (0.001)

[1]SUS coded CKD stage defined using International Classification of Diseases – 10th Edition (ICD-10) codes.
[2]MINAP coded eGFR stage derived from serum creatinine measured within 24 hours of ACS hospitalisation using KDIGO cut points for CKD stage. ACS hospitalisations with missing serum creatinine were excluded (n=26,737).

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Submission number: 523

Characterising chronic kidney disease outcomes and associated risk factors in a longitudinal population-based cohort from six study sites in West, East, and South Africa.

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Dr June Fabian

Biography
June Fabian trained as a medical doctor at the University of the Witwatersrand in Johannesburg, South Africa. After that, June specialized as a physician, and then as a nephrologist, and is currently the Director of Clinical Research at Wits Donald Gordon Medical Centre. June's initial research focused on HIV-associated kidney disease prior to access to antiretroviral therapy, later expanding her scope of work to include the epidemiology of kidney disease in African populations. June works collaboratively with colleagues in Uganda, Malawi and the UK, as part of a multicentre collaboration, the African Research on Kidney Disease (ARK) Consortium. The ARK Consortium focuses on understanding the pathophysiology of CKD and associated risk (including genetic risk) in African populations, and has conducted ground-breaking research on how best to measure kidney function in Africa. June is committed to research excellence in Africa and capacitating the next generation of African scientists.

Abstract

Introduction: Studies characterising kidney disease in Africa remain cross-sectional, limiting our understanding of CKD progression, incidence, associated risk factors, and mortality. To address these knowledge gaps, we evaluated kidney function in this longitudinal population-based cohort of adults in West, East, and South Africa.

Methods: This study is part of the Africa Wits-International Network for the Demographic Evaluation of Populations and their Health (INDEPTH) Partnership for Genomic Studies (AWI-Gen). At baseline, the study recruited over 12,000 participants aged 40-60 years from six sites: West Africa (Ghana and Burkina Faso), East Africa (Kenya), and South Africa. Both West African sites are rural, the East African site is urban, with two of three sites in South Africa rural and one urban. The baseline study investigated kidney dysfunction and associated risk factors[1]. All participants provided written informed consent at each visit, during which demographic and health information was obtained, and anthropometric measurements, clinical data, and fasting venous blood samples were collected. Kidney function was

assessed with serial eGFR using the CKD-EPI (creatinine) 2009 equation without race-based adjustment. Serum creatinine was measured using Jaffe's kinetic method calibrated to an isotope dilution mass spectrometry (IDMS)-traceable standard. CKD was defined as eGFR <60ml/min/1.73m^2. Diabetes was defined as fasting blood glucose ≥7.0mmol/L, random blood glucose >11.0mmol/L, self-reported history of diabetes mellitus, or current treatment. Hypertension was defined as systolic BP ≥140 mm Hg, diastolic BP ≥90 mm Hg, self-reported history of hypertension, or current treatment. HIV status was determined by self-report or rapid testing. Cardiovascular disease was defined as self-reported stroke, TIA, or heart failure. Mortality during the study period was ascertained at follow-up.

Results: 12,032 participants with complete data, including eGFR measures, were recruited in 2013-2016. Cohort characteristics overall, and for those with and without CKD at follow-up, are summarised in **Table 1**. Baseline median eGFR was 100 (IQR 87-107) ml/min/1.73m^2 and 3.2% (383) had CKD. This was associated with older age, HIV, diabetes, and cardiovascular disease, higher systolic BP, LDL, and total cholesterol. Women with CKD had significantly higher weight, BMI, and waist and hip circumferences. The rural site in Mpumalanga, South Africa, had the highest CKD prevalence among all sites at 30.6% (117/383).

At follow-up, repeat eGFR measures were available in 7,807 participants with a median follow-up of 5 (IQR 5-6) years. Overall, median eGFR decreased to 91 (IQR 77-99) ml/min/1.73m^2, and CKD incidence was 5.7% (404 new cases). Crude death rates for the cohort were 5.5% (666/12,032), with more of the deaths among men (382/666; 57.4%). Compared to those without CKD, mortality was higher in the group with prevalent CKD at baseline (OR 3.1 (95% CI 2.3-4.2)), with disproportionate mortality observed in men (26/127; 20.5%) compared to women (30/256; 11.7%).

Between baseline and follow-up, there were striking changes in NCD prevalence: hypertension increased from 37.7% to 46.2%, diabetes increased from 7.3% to 12.1%, and CKD in the urban site in South Africa, Soweto, increased from 15.4% to 25.7%.

Variable	All N=7807	CKD Negative N=7325	CKD Positive N=482
Site n(%)			
Agincourt	1255(16.1)	1110(15.2)	145(30.1)
Dikgale	1239(15.9)	1185(16.2)	54(11.2)
Nairobi	1189(15.2)	1141(15.6)	48(10.0)
Nanoro	1500(19.2)	1426(19.5)	74(15.4)
Navrongo	1208(15.5)	1171(16.0)	37(7.7)
Soweto	1416(18.4)	1292(17.6)	124(25.7)
Age in years	N=7807	N=7325	N=482
Median(IQR)	56(51-62)	56(51-62)	61(55-66)
HIV status n(%)	(n=7738)		
No	4878(63.0)	4569(63.0)	309(64.1)
Yes	897(11.6)	810(11.2)	87(18.0)
I don't know	1963(25.4)	1877(24.3)	86(17.8)
Diabetes n(%)	(n=7748)		
No	6814(87.9)	6432(88.5)	382(79.3)
Yes	934(12.1)	834(11.5)	100(20.8)
Stroke n(%)	(n=7738)		
No	7605(98.3)	7141(98.4)	464(96.5)
Yes	122(1.6)	106(1.5)	16(3.3)
I don't know	11(0.1)	10(0.1)	1(0.2)
TIA n(%)	(n=8591)		
No	7584(98.1)	7121(98.2)	463(96.3)
Yes	133(1.7)	116(1.6)	17(3.5)
I don't know	17(0.2)	16(0.2)	1(0.2)
Heart attack n(%)	(n=7739)		
No	7700(99.5)	7226(99.6)	474(98.8)
Yes	30(0.4)	24(0.3)	6(1.3)
I don't know	9(0.1)	9(0.1)	0(0.0)
CHF n(%)	(n=7738)		
No	7699(99.5)	7226(99.6)	473(98.5)
Yes	30(0.4)	23(0.3)	7(1.5)
I don't know	9(0.1)	9(0.1)	0(0.0)
Hypertension n(%)			
No	4158(53.8)	3968(54.7)	190(39.5)
Yes	3576(46.2)	3285(45.3)	291(60.5)
Weight (kg)	N=7718	N=7240	N=478
Median(IQR)	65.8(55.4-79.5)	65.6(55.4-79)	70.1(57.1-86.1)
Waist Circ (cm)	N=7807	N=7242	N=480
Median	87(78.2-98)	86.6(78.1-97.4)	91.5(80-101.8)
Hip Circ (cm)	N=7807	N=7243	N=479
Median	97.1(89-108)	97(89-107.5)	103(92.5-116.9)
BMI	N=7717	N=7239	N=478
Median(IQR)	23.8(20.2-29.6)	23.6(20.1-29.2)	27.7(22.2-33.2)
Systolic BP	N=7733	N=7251	N=482
Mean(sd)	128.7(22.7)	128.5(22.5)	131.5(25.3)
Glucose	N=7578	N=7099	N=479
Mean(sd)	5.9(2.3)	5.8(2.2)	6.6(3.5)
Friedwald LDL	N=7548	N=7069	N=479
Mean(sd)	2.7(0.9)	2.7(0.9)	2.9(1.0)
Cholesterol	N=7579	N=7097	N=482
Mean(sd)	4.6(1.1)	4.5(1.1)	4.9(1.2)
EGFR	N=7807	N=7325	N=482
Median(IQR)	90.7(76.8-98.5)	91.9(79.8-98.6)	53.9(48.1-57.5)
EGFR Stage n(%)	(n=7807)		
Stage1	4068(52.1)	4068(55.5)	0(0.0)
Stage 2	3257(41.7)	3257(44.5)	0(0.0)
Stage 3	465(6.0)	0(0.0)	465(96.5)
Stage 4	13(0.17)	0(0.0)	13(2.7)
Stage 5	4(0.1)	0(0.0)	4(0.8)

Discussion : This study shows that the burden of CKD is increasing in African populations, as well as hypertension and diabetes, and that obesity-related CKD risk was only relevant in women. Mortality is increased among people with CKD, especially in men.

References

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Using Mendelian randomization to explore the role of the human metabolome in chronic kidney disease

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Miss Nancy Smart

Biography
Nancy Smart is a second-year PhD student at the University of Bristol. She received her integrated master's degree in biology from the University of Warwick, during which she undertook a year long placement at the pharmaceutical company Lonza, Cambridge. Her PhD is within population health sciences at the Bristol Medical School. She is interested in epidemiology, the microbiome and metabolomics.

Abstract

Introduction: Chronic kidney disease is a major public health concern, with over 10% of adults affected worldwide. Studies on plasma metabolites have revealed potential biomarkers of kidney function and indicated potential mechanistic links. Through the use of Mendelian randomization (MR), this study aims to elucidate the causal relationship between CKD and circulating metabolites, that can be exploited therapeutically.

Methods: Bi-directional two-sample Mendelian randomization (MR) analyses using inverse variance weighted models were performed to assess the potential causal relationships between plasma metabolites and CKD. A 'forward MR' was performed first to explore if changes in plasma metabolites causally influence the risk of CKD, followed by a 'reverse MR' investigating if CKD causes a change in metabolites. Single nucleotide polymorphisms (SNPs) associated with estimated glomerular filtration rate (eGFR) / urine albumin-creatinine ratio (uACR) were selected from Genome-Wide-Association Studies (GWAS) of European populations and used as proxies for kidney function (publicly available data from the CKDGen Consortium). SNPs associated with 249 metabolic measures quantified using targeted high-throughput NMR metabolomics were used as proxies for plasma metabolites (data from Nightingale Health Laboratories and UKBiobank). Sensitivity analyses including Radial MR and colocalization were performed to check for pleiotropy and heterogeneity.

Results: Current analyses suggest that glycine and glycoprotein acetyls could have a causal role in determining kidney health. Glycoprotein acetyls are positively associated with eGFR, and glycine has been linked to eGFR and uACR, although directionality is being investigated. Results of our reverse MR analysis demonstrated that eGFR was negatively associated with serum citrate and serum creatinine, as expected.

Discussion: Our results demonstrate putative causal associations between plasma metabolites and kidney function, which could be exploited therapeutically.

Poster number: 087

Submission number: 588

RELEVELLING-CKD1: Social determinants of health associated with the screening of individuals for Chronic Kidney Disease between 2015-2021.

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Dr Rakesh Dattani

Biography
Dr Rakesh Dattani is a clinical research fellow at Imperial College London with a specialist interest in the early detection of Chronic Kidney disease and improving outcomes for individuals with CKD.

Abstract

Ethnicity	Fully Screened	Partially Screened	Not Screened	Total	% of Grand Total = 277,711
White	996 (0.75%)	88758 (66.41%)	43904 (32.85%)	133,658 (100%)	48.13%
Asian or asian british	600 (0.89%)	53358 (78.78%)	13772 (20.33%)	67,730	24.39%
NULL	5* (0.02%)	930 (3.12%)	28861 (96.85%)	29,800	10.73%
Black or black british	244 (1%)	18028 (73.52%)	6250 (25.49%)	24,522	8.83%
Other ethnic groups	153 (0.96%)	11253 (70.58%)	4538 (28.46%)	15,944	5.74%
Mixed	52 (=0.86%)	4327 (71.38%)	1683 (=27.76%)	6,062	2.18%
Grand Total	2,054	176,654	99,008	277,711	100.0%
Deprivation (IMD Score)	Fully Screened	Partially Screened	Not Screened		
1 to 3	603 (0.83%)	46393 (63.75%)	26381 (35.95%)	73,377	26.42%
4 to 7	1052 (0.73%)	92608 (63.95%)	51153 (35.32%)	144,813	52.15%
8 to 10	290 (0.60%)	31353 (64.77%)	16767 (34.64%)	48,410	17.43%
NULL	104 (0.94%)	6300 (57.24%)	4707 (42.36%)	11,111	4.00%
				277,711	100.00%
Frailty (Efi Score)	Fully Screened	Partially Screened	Not Screened	48,410	
Mild	609 (0.74%)	58224 (70.62%)	23616 (28.64%)	82,449	29.69%
Moderate	548 (1.45%)	28221 (74.52%)	9099 (24.03%)	37,868	13.64%
NULL	5* (0.04%)	3544 (25.16%)	10533 (74.49%)	14,084	5.07%
Severe	653 (3.04%)	18197 (84.62%)	2655 (12.35%)	21,505	7.74%
Well	237 (0.19%)	68468 (56.21%)	73377 (60.24%)	121,810	43.86%
Grand Total	2,054	176,654	144,813	277,711	100%%
Population risk factors	Fully Screened	Partially Screened	48,410	Total	
Anti pscyhotics	463 (1.24%)	32227 (86.18%)	4705 (12.58%)	37,395	13.47%
Drug abuse	502 (2.03%)	22694 (91.62%)	1573 (6.35%)	24,769	8.92%
Physical disability	201 (3.18%)	5821 (92.22%)	290 (4.59%)	6,312	2.27%
Alcohol relComp	22 (1.23%)	1420 (79.15%)	352 (19.62%)	1,794	0.65%
Learning disability	7 (0.74%)	806 (85.65%)	128 (13.60%)	941	0.34%
Bipolar Drugs	5* (1.52%)	284 (86.32%)	37 (11.25%)	329	0.12%
Grand Total	1,203	63,252	7,085	71,535	25.76%
Smoking Status	Fully Screened	Partially Screened	48,410	Total	
Never smoked	1314 (0.93%)	116370 (82.24%)	23816 (16.83%)	141,500	50.95%
Current smoker	294 (0.90%)	23089 (70.73%)	9261 (28.37%)	32644	11.75%
Ex-smoker	852 (2.45%)	28,865 (82.89%)	5,105 (14.66%)	34,882	12.56%
No Status				68,685	24.73%
Grand Total	2460	168324	38182	277,711	100.00%
Alcohol Status	Fully Screened	Partially Screened	48,410	Total	
Non Drinker	1870 (1.15%)	136600 (84.08%)	23999 (14.77%)	162,469	58.50%
Current Drinker	78 (0.63%)	10053 (80.72%)	2319 (18.62%)	12,454	4.48%
Ex-Drinker	0	31	20	53	0.02%
				102,735	36.99%
Grand Total	1948	146684	26338	277,711	100.00%

Introduction: The prevalence of Chronic Kidney Disease (CKD) is increasing. We previously reported the association between social determinants of health and screening for CKD in at risk populations between 2010-2014. Here, utilising the Discover London SDE dataset, we present the association between social determinants and CKD screening between 2015-2021.

Method: Adult population without CKD, but a clinical risk factor for CKD prior to 1/1/2010, were identified, with screening practices annually from 2015 to 2021 assessed. Individuals were deemed to be fully screened (cohort 1) if an estimated Glomerular Function Rate (eGFR) was performed with a urine dipstick test and an urine Albumin Creatinine Ratio (uACR), and partially screened (cohort 2) if 1 or 2 of the three required tests were performed. Cohort 3= individuals not screened. Each group was assessed to determine social determinants of health (ethnicity, age, gender, frailty, index of multiple deprivation

(IMD), smoking status, alcohol consumption, occupation, serious mental health illness, and language) associated with each cohort.

Results: Amongst the 277,711 identified individuals, 0.74% were fully screened, 63.61% partially screened and 35.65% not screened between 2015-2021. 10.7% had no ethnic group recorded on their EHR's. The 3 commonest ethnic groups were White Caucasian (48.13%), Asian or Asian British (24.39%) and Black or Black British (8.83%). 96.85% of individuals without an ethnicity recorded were not screened for CKD. IMD measures relative deprivation, with IMD1-3 the most deprived and IMD 8-10 the least. Amongst the 73,377 with IMD 1-3: 0.83% - fully screened, 63.75%-partially screened, 35.95%-not screened; 144,813 individuals with IMD4-7: 0.73% - fully screened, 63.95%-partially screened, 35.32%-not screened; 48,410 individuals with IMD 8-10, with 0.60% fully screened, 64.77% partially screened, 34.64%-not screened. Frailty was identified using the electronic frailty index, with 74.49% of individuals without a frailty score recorded not undergoing screening for CKD. 13.47% were on anti-psychotic medication (fully screened – 1.24%, partially screened 86.18%, not screened 12.58%); 8.92% had a history of drug abuse (fully screened – 2.03%, partially screened - 91.62%, not screened - 6.35%); 2.27% had a physical disability (fully screened – 3.18%, partially screened - 92.22%, not screened - 4.59%); 0.65% had an alcohol related complication (fully screened – 1.23%, partially screened - 79.15%, not screened 19.62%); 0.34% had a learning disability (fully screened – 0.74%, partially screened - 85.65%, not -screened 13.60%) and 0.12% prescribed medication for bipolar disease (fully screened – 1.52%, partially screened 86.32%, not screened 11.25%).

75.26% individuals had a documented smoking status. 50.95% of the cohort identified as never smoked (fully screened – 0.93%, partially screened – 82.24%, not screened – 16.83%), 11.75% as a current smoker (fully screened – 0.90%, partially screened – 70.73%, not screened – 28.37%), 12.56% as an ex smoker (fully screened – 2.45%, partially screened – 82.89%, not screened – 14.66%). Amongst 174,976 individuals with a documented alcohol status 84.94% were either fully or partially screened for CKD between 2015-2021.

Conclusion: Social determinants of health have a profound impact on the screening of individuals at risk of CKD. Such factors are therefore needed to be addressed when formulating new clinical pathways to improve CKD detection, to ensure all social groups are provided with accessible and equal care to prevent the development of disproportionate levels of advanced CKD in any given population.

Poster number: 088

Submission number: 590

2-year kidney outcomes after hospital admission with COVID-19: Record linkage and analysis from the RECOVERY trial

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Dr Waseem Karsan

Biography
Waseem is a renal registrar undergoing higher speciality training in Thames Valley. Waseem joined the Heart and Renal Studies Group (Clinical Trials Service Unit, Nuffield Department of Population Health, University of Oxford) in August 2021 as a Clinical Research Fellow working on the ORION-4 trial (a randomised controlled trial assessing the effect of Inclisiran on clinical outcomes among people with cardiovascular disease).

Abstract

Introduction: The SARS-CoV-2 virus emerged in November 2019 with evidence estimating COVID-19 associated acute kidney injury (AKI) among hospitalised patients as prevalent as 40%[1]. Data on adverse kidney outcomes are limited to short-term follow-up with only a small number of studies examining the effects of COVID-19 hospitalisation on adverse kidney outcomes at greater than 1 year[2].

The Randomised Evaluation of COVID-19 Therapy (RECOVERY) trial is an open-label, randomised controlled platform trial assessing the effects of various treatments on mortality in patients hospitalised with COVID-19 [NCT04381936][3]. Eligible participants are randomised to one or more treatment arms with each given in addition to the usual standard of care. Through linkage to central National Health Service (NHS) records, national audits (e.g. UK Renal Registry, UKRR) and other research databases[4] the RECOVERY trial has allowed for exploratory analyses of the risk of adverse kidney outcomes in patients hospitalised with COVID-19.

Methods: This analysis included RECOVERY trial participants recruited in England excluding those with CKD stage 5 (defined as maintenance dialysis therapy, receipt of renal transplant or sustained eGFR of < 15mL/min/1.73m[2]) at baseline and those who had previously withdrawn consent. Linked healthcare systems data, including primary care data (General Practice Extraction Service Data for Pandemic Planning and Research), secondary care data (Hospital Episode Statistics), mortality data (Office for National Statistics) and UKRR was used to determine baseline CKD stage, the presence of AKI at baseline, maintenance dialysis therapy and cause-specific mortality.

The incidence of (i) kidney disease progression (composite outcome of 40% decline in eGFR, initiation of maintenance renal replacement therapy or death from kidney failure), and (ii) decline in one or more CKD stage from baseline were determined at 6, 12 and 24 months. Analyses were stratified according to

baseline CKD stage, presence/absence of baseline AKI and reported as absolute event rates (with their corresponding 95% confidence intervals).

Results: Final number of kidney disease progression outcomes to be confirmed following updated analyses in March 2024, including full 24-month follow-up for all participants.

Over 30,000 participants were included in this analysis. Preliminary data suggests more than 550 participants met the criteria for kidney disease progression and over 2000 participants had a decline of one or more CKD stage within 24 months of randomisation. Risks of kidney disease progression and decline in CKD stage were both associated with baseline CKD stage. In addition, the risk of kidney disease progression was associated with the presence of AKI at baseline.

Discussion: Among patients admitted to hospital with COVID-19, baseline CKD stage and the presence of AKI is an important risk factor for decline in kidney function over 2 years. Our data suggest that the COVID-19 pandemic has had a detrimental impact on progression of CKD. These data provide a framework in which to assess the effects of treatments for COVID-19 on kidney outcomes.

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Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

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RELEVELLING-CKD1: Evaluation of the impact of social determinants of health on coding of individuals diagnosed with Chronic Kidney Disease between 2015-2021 in North West London

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Dr Rakesh Dattni

Biography
Dr Rakesh Dattani is a clinical research fellow at Imperial College London with a specialist interest in the early detection of Chronic Kidney disease and improving outcomes for individuals with CKD.

Abstract

Introduction: Coding of Chronic Kidney Disease (CKD) with electronic health records (EHR's) is associated with improved management and outcomes for individuals with CKD. Factors influencing coding of CKD, therefore impact CKD prognosis. The relationship between social determinants of health and CKD coding therefore needs to be better understood. Having reported on factors influencing coding of individuals diagnosed with CKD between 2010-2014, we now report on the social determinants of health impacting coding of CKD between 2015-2021, utilising the Discover London SDE dataset.

Method: Individuals diagnosed with CKD on the background of a clinical risk factor for CKD prior to 2010, between 2015-2021 we're grouped into 1 of 3 cohorts: (1)Diagnosed and coded for CKD within EHR's by 31/12/2021. (2) Results indicative for CKD who remained uncoded by 31/12/2021, (3) No CKD diagnosed by 31/12/2021. Each group was subsequently assessed for social determinants of health including ethnicity, age, gender, frailty, index of multiple deprivation (IMD), smoking status, alcohol consumption, occupation, serious mental health and language.

Results: Amongst 277,711, 229,432 individuals were not coded/diagnosed with CKD between 1/1/2010-31/12/2014. 36,663/229,341(15.98%) were diagnosed with CKD between 1/1/2015-31/12/2021 (9022 coded within EHR's Vs 27,641 results indicative but not coded within EHRs), with 192,769 (84.02%) individuals not developing CKD between 2010-2021. Cohort 1 as opposed cohort 2 were older with 47.89% aged 65-84 and predominantly coded with CKD stage 3 (cohort 1) Vs 53% between 45-64 years with results predominantly indicating CKD stage 1-2. White Caucasian, Asian/British Asian and Black/Black British were the 3 most commonly seen ethnic groups across cohort 1 and 2, with individuals in cohort 3 more likely to have no documented ethnicity as opposed to cohort 1 or 2 (15.06% Vs 0.21% Vs0.30%). IMD1-3 represented the most deprived and IMD 8-10 the least deprived, with 28.49% Vs 27.39% Vs 26.26% (IMD 1-3); 52.13% Vs 52.6% Vs 52.17% (IMD4-7) and 16.11% Vs 16.23% Vs 17.51 % (IMD 8-10). Individuals in cohort 1 were predominantly of moderate or severe frailty (60.3%) whilst cohorts 2 and 3 were predominantly of no or mild frailty (67.76% and 78.89%). Individuals in cohort 3 were more likely to have no frailty recorded Vs cohorts 1 and 2 (7.07% Vs 0.08% and 0.36%). Individuals in cohort 1 and 2 were more likely to be on anti-psychotic medication Vs cohort 3 (22.40%, 22.07% Vs2.70%). Overall individuals in cohort 3 had lower levels of drug abuse, alcohol related complications, physical/learning disability, or medication for bipolar disorder. Individuals in cohort 3 had a higher degree of individuals with no smoking status documented (34.22%) Vs cohort 1 and 2 (2.28% and 1.90%). Employment status, housing status, occupation, literacy, education status were assessed, with a high degree of missing data.

Conclusion: We report the initial findings of population differences on the determinants of health associated with the formal coding of CKD within EHR's. An improved appreciation of how social determinants of health impact the coding of CKD, will aid our ability to widen access to CKD care and reduce the number of individuals with advanced CKD, particularly from groups traditionally associated with health inequalities.

Ethnicity	Cohort 1 - Coded for CKD within EHR between 1/1/2015-31/12/2021 n=9022	Cohort 2 - Diagnosed with CKD but not coded with EHR between 1/1/2015-31/12/2021 n=27,641	Cohort 3 - Not diagnosed with CKD n=192,769
White	51.67%	45.60%	47.77%
Asian or asian british	27.67%	33.42%	21.67%
Black or black british	12.19%	11.51%	7.80%
Other ethnic groups	5.95%	6.77%	5.57%
Mixed	2.31%	2.41%	2.13%
NULL	0.21%	0.30%	15.06%

Deprivation (IMD Score)	Cohort 1 - Coded for CKD within EHR between 1/1/2015-31/12/2021 n=9022	Cohort 2 - Diagnosed with CKD but not coded with EHR between 1/1/2015-31/12/2021 n=27,641	Cohort 3 - Not diagnosed with CKD n=192,769
1 to 3	28.49%	27.39%	26.26%
4 to 7	52.13%	52.60%	52.17%
8 to 10	16.11%	16.23%	17.51%
NULL	3.28%	3.78%	4.06%

Frailty (Efi Score)	Cohort 1 - Coded for CKD within EHR between 1/1/2015-31/12/2021 n=9022	Cohort 2 - Diagnosed with CKD but not coded with EHR between 1/1/2015-31/12/2021 n=27,641	Cohort 3 - Not diagnosed with CKD n=192,769
Well	9.89%	29.76%	51.79%
Mild	29.78%	38.00%	27.10%
Moderate	28.88%	19.38%	10.00%
Severe	31.42%	12.50%	4.05%
Null	0.08%	0.36%	7.07%

Population risk factors	Cohort 1 - Coded for CKD within EHR between 1/1/2015-31/12/2021 n=9022	Cohort 2 - Diagnosed with CKD but not coded with EHR between 1/1/2015-31/12/2021 n=27,641	Cohort 3 - Not diagnosed with CKD n=192,769
Anti pscyhotics	22.40%	20.07%	2.70%
Drug abuse	26.95%	17.94%	0.24%
Physical disability	8.29%	4.49%	0.05%
Alcohol relComp	1.01%	0.86%	0.10%
Learning disability	0.38%	0.17%	0.07%
Bipolar Drugs	0.34%	0.51%	0.04%

Smoking Status	Cohort 1 - Coded for CKD within EHR between 1/1/2015-31/12/2021 n=9022	Cohort 2 - Diagnosed with CKD but not coded with EHR between 1/1/2015-31/12/2021 n=27,641	Cohort 3 - Not diagnosed with CKD n=192,769
Never smoked	65.63%	67.79%	45.46%
Current smoker	10.06%	12.48%	11.24%
Ex-smoker	22.02%	17.94%	17.80%
No Status	2.28%	1.90%	34.22%

Alcohol Status	Cohort 1 - Coded for CKD within EHR between 1/1/2015-31/12/2021 n=9022	Cohort 2 - Diagnosed with CKD but not coded with EHR between 1/1/2015-31/12/2021 n=27,641	Cohort 3 - Not diagnosed with CKD n=192,769
Non Drinker	32.94%	28.71%	18.24%
Current Drinker	2.23%	1.75%	1.45%
Ex-Drinker	0.02%	0.01%	0.01%
No Status	64.69%	69.52%	80.30%

Health Inequalities in kiDney Disease: mEeting the urgent need to identify Early disease in high-risk commuNities (HIDDEN-CKD)-preliminary analysis

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Mrs Roseline Agyekum

Biography

Roseline Agyekum is a community kidney nurse researcher and Lead Nurse for Clinical Practice and Education Roseline has over 20 years of clinical and teaching and practice development experience in the renal care setting. In her previous role as clinical renal nurse, Roseline facilitated peer (patients) teaching to raise awareness of the benefits of kidney transplantation among people of Black people. Her practice development focus has been on continuous workforce education to enable the delivery of equitable renal nursing care. In 2021, Roseline secured an NIHR Pre-doctoral Clinical and Practitioner Academic Fellowship which focussed on addressing kidney health inequalities among people of African and Caribbean heritage. As a Community Kidney nurse researcher, Roseline is leading a team of Peer Educators to undertake community kidney health screening within the African and Caribbean communities using desk-top analyser and smartphone urine ACR tests. Roseline's PhD focuses on early identification of kidney disease among people of African and Caribbean communities and family members of people diagnosed with chronic kidney disease. She is passionate about promoting health literacy and collaborating and engaging with lay community members, faith and non-faith groups and charity organisations to continually develop culturally tailored information to reduce kidney health inequalities.

Abstract

Introduction: People of ethnic minority groups and those living with socioeconomic deprivation are disproportionately affected by CKD. HIDDEN-CKD explored the feasibility of delivering peer educator (PE) led kidney health screening (urine albumin creatinine ratio (uACR) testing) community events in South East London to identify early CKD in African and Caribbean majority communities.

Methods:

Stage 1: Public engagement to co-design culturally appropriate CKD materials

Stage 2: Peer educator recruitment and accredited training; engagement with local faith and non-faith community leaders.

Stage 3: Stand-alone and community joint events held in African and Caribbean community settings including a 15 minute educational session (English and native language translation) and 30 minute question time. After informed consent demographic and medical details, blood pressure, body mass index and urinary albumin creatinine ratio (uACR) data were collected using smartphone (on-site or home) or desk-top analyser. Culturally congruent information and peer educator support were available throughout. After each event those with positive tests were contacted and supported to go to the GP.

Stage 4: Descriptive analysis of demographics, uACR results and outcomes according to data distribution were reported

Results: 1066 participants have been recruited; 565 (53.0%) and 501 (47.0%) were offered desk-top analyser and smartphone ACR tests respectively, including 172 (34.4%) smartphone tests taken home. 964 (91.4%) uACR semi-quantitative tests were successfully completed 565 (100%) by desk-top analyser and 406 (81.0%) smartphone tests with peer educators input. Only 79 (45.9%) of home tests were completed despite follow-up calls.

The majority of participants were Black (85.4%) and female (56.1%) with no known self-reported medical history (63.5%) (See table 1). Self-reported rates of hypertension and diabetes were 24.3% and 4.1% respectively and only 3.7% of people were aware of a family history of CKD.

430 (44.6%) uACR were ≥3mg/mmol but only 12 (1.2%) of people were aware of having CKD. People with uACR ≥3mg/mmol were more likely to be older, have higher BMI and higher blood pressure than people with uACR <3mg/mmol (P<0.05). Nearly half of Black participants had uACR ≥3mg/mmol (340; 47.2%) compared with a quarter of Asian and White participants 15 (26.8%) and 13 (25.0%) respectively), and people with a history of hypertension (57.0%) had comparable rates of uACR ≥3mg/mmol as people with diabetes (52.5%).

Discussion & Conclusion: Peer-educator led community testing in Black majority communities can identify high rates of albuminuria in many with previously unknown CKD. In this cohort, people of Black ethnicities and those with hypertension were disproportionately affected. This study has highlighted the need for development of community approaches to reducing kidney health inequalities. The presence and support of trusted peer-educators may help reduce the gap in access and acceptability of CKD screening to detect asymptomatic albuminuria in high risk groups who have historically been underserved by CKD prevention strategies. Further work is needed to develop this approach to address inequities in CKD outcomes in the UK and beyond.

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Table 1: Demographics

Demographic	Total	uACR <3 mg/mmol	uACR 3-30 mg/mmol	uACR >30 mg/mmol
uACR completed	964 (90.4%)	533 (55.3%)	373 (38.7%)	58 (5.9%)
Age (Mean/SD)	50.8 ±14.2	49.0 ±14.7	52.6 ±13.5)	55.0 ±14.1)
Gender (n/%)				
Female	541 (56.1%)	276 (51.1%)	238 (43.9%)	27 (4.9%)
Male	423 (44.8%)	256 (60.5%)	135 (31.9%)	31(7.3%)

Ethnicity (n/%)				
Black	824 (85.4%)	435 (52.8%)	337 (40.9%)	52 (6.3%)
African	699 (72.5%)	369 (52.8%)	281 (40.2%)	49 (7.0%)
Caribbean	103 (10.7%)	50 (48.5%)	50 (48.5%)	3 (2.9%)
Other	22 (2.2%)	16 (72.3%)	6 (27.3%)	0 (0%)
Asian	56 (5.8%)	41 (73.2%)	14 (25.0%)	1 (1.8%)
Pakistani	14 (1.5%)	10 (71.4%)	3 (21.4%)	1 (7.1%)
Indian	31 (3.2%)	22 (71.0%)	9 (29.0%)	-
Other	11 (1.1%)	9 (81.8%)	2 (18.2%)	-
White	52 (5.4%)	39 (75.0%)	11 (21.2%)	2 (3.8%)
British	34 (3.5%)	27 (79.4%)	6 (17.6%)	1 (2.9%)
Irish	2 (0.2%)	2 (100.0%)	-	-
Other	16 (1.7%)	10 (62.5%)	5 (31.3%)	1 (6.2%)
Mixed	32 (3.3%)	18 (56.3%)	11 (34.4%)	3 (9.3%)
Black/White African	16 (1.7%)	8 (50.0%)	6 (37.5%)	2 (12.5%)
Black/White Caribbean	10 (1.0%)	5 (50.0%)	4 (40.0%)	1 (10.0%)
Other	6 (0.6%)	5 (83.3%)	1 (16.7%)	-

BMI- (Mean/SD)	29.8 ±5.7	29.4 ±6.0	30.05 ±5.1	31.2 ±6.8
BP (Mean/SD)				
Systolic	136 ±20.4	134 ±19.5	138 ±20.7	139.5 ±19.8
Diastolic	82.6 ±11.9	81 ±11.3	83 ±12.3	85.6 ±11.8
Family history of CKD (n/%)	**36 (3.7%)**	**22 (61.1%)**	**11 (30.6%)**	**3 (8.3%)**
Black	31 (3.2%)	20 (64.5%)	9 (29.0%)	2 (6.5%)
White	4 (0.4%)	2 (50%)	2 (50%)	-
Asian	1 (0.1)	1 (100%)	-	-
Mixed	1 (0.1)	-	-	1 (100%)
Medical history (self-reported)				
No medical History	612 (63.5%)	374 (61.1%)	214 (34.9%)	24 (3.9%)
Hypertension	235 (24.3%)	101 (43.0%)	116 (49.3%)	18 (7.7%)
Diabetes	40 (4.1%)	19 (47.5%)	13 (32.5%)	8 (20.0%)
Chronic Kidney Disease	12 (1.2%)	3 (25.0%)	6 (50.0%)	3 (25.0%)
Prefers not to disclose	29 (3.0%)	8 (27.5%)	18 (62.1%)	3 (10.3%)
Other	36 (3.7%)	20 (55.5%)	11 (30.5%)	5 (13.9%)

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Procalcitonin as a diagnostic and monitoring tool for bacteraemia in patients on haemodialysis: A systematic review

Mr Aniebiot-abasi Udofia, Dr Tamarie Rocke

Mr Aniebiot-abasi Udofia

Biography
Dr. Aniebiot-abasi Udofia, an ardent Nephrology trainee based in Leicester, has roots in Nigeria where his fascination with the intricate functions of kidneys began early in life. Equipped with a robust background in multiple nephrology-related audits and Quality Improvement Projects (QIPs), his enduring passion lies in enhancing and positively impacting current clinical practice. He recently earned his Masters in science. Driven by a commitment to patient-centered care, he looks ahead to actively engage in and contribute to the ongoing progress within the renal field.

Abstract

Introduction: In patients with kidney disease undergoing dialysis, infections are a major non-cardiac cause of mortality. The increasing antimicrobial resistance globally further exacerbates this concern. Procalcitonin has shown potential in aiding antimicrobial stewardship and reducing mortality and morbidity associated with infections. This systematic review aims to synthesise the existing literature on the utility of procalcitonin as a diagnostic and monitoring tool for haemodialysis patients with suspected bacteraemia.

Methods: Multiple electronic databases (EMBASE, MEDLINE, and the Cochrane Library) were systematically searched, in conjunction with Google scholar and citation-driven search approach, to identify primary studies evaluating procalcitonin use in haemodialysis patients with suspected bacteraemia. The selected studies were comprehensively evaluated, and relevant data was extracted. Using a narrative synthesis approach, along with other quality assessment tools, recommendations regarding procalcitonin usage in dialysis were formulated(Fig 1).

Results: Eleven studies were identified (Fig 2). The review consistently indicates a link between elevated procalcitonin levels and the presence and severity of bacteraemia, suggesting its potential as a diagnostic and monitoring tool. Caution is however advised against relying solely on procalcitonin for diagnosis, emphasising the integration of procalcitonin with other clinical and biomarkers of infection. The review proposes a procalcitonin-guided antibiotic protocol aimed at facilitating the antibiotics use in haemodialysis patients with suspected bacteraemia(Fig 3).

Discussion/conclusion: Procalcitonin shows promise as a valuable diagnostic and monitoring tool for suspected bacteraemia in haemodialysis patients. While caution is advised against relying solely on

procalcitonin for diagnosis, its integration with other clinical indicators can enhance infection management. To fully establish its clinical utility, more research is needed.

Fig 1. Graphical representation of study methodology

Agrawal, 2019
Retrospective design
- Higher PCT level corresponds to higher rates of severe complications and death.
- PCT>0.9ng/ml indicates bacterial infection

Zhai, 2021
Prospective design
- Strong association between treatment and PCT reduction, which corresponds with reduction in other markers of infection

Kim, 2022
Retrospective design
- Effective treatment is associated with >60% PCT reduction after 72hours
- Multiple pct levels taken on different days has better prognostic value than a single PCT level

Hamada & Gamal, 2017
Prospective design
- PCT levels are higher in patients with +ve Blood cultures; and shows a positive correlation with CRBSI

Procalcitonin use in HD patients

Schneider, 2020
Prospective design
- PCT level> 1ng/ml is associated with bacterial infections.
- Using PCT as a sole biomarker is not advised due to risk of overlap

Yunus, 2018
Retrospective design
- statistically significant association between PCT and severity of bacterial sepsis and severe complications

Navas, 2018
Prospective design
- Effective treatment corresponds to PCT reduction

Herget-Rosenthal, 2001
Prospective design
- PCT levels <0.8ng/ml correlates with a lower chance of bacterial infections.
- PCT levels >1.5ng/ml indicates severe bacterial infection and sepsis

Demir, 2018
Retrospective design
- PCT levels < 0.6ng/ml indicates no active bacterial infections or properly Rx infections.
- Using both CRP and PCT increases sensitivity specificity of bacterial infections

Park, 2014
Prospective Design
- PCT levels >1.1ng/ml can be used as predictor for bacterial infection, while PCT levels <0.55ng/ml can be used as predictor of no bacterial infection

Jiang, 2019
Retrospective design
- PCT level >1.6ng/ml is an independent risk factor/predictor for bacterial sepsis.

Fig 2: Studies included and summary of relevant findings

clinical/ biochemical signs of bacteraemia / sepsis

Yes — Check procalcitonin

No — No indication for antibiotics – monitor

PCT <0.5ng/ml → Unlikely bacteraemia , no indication to start antibiotics

PCT 0.5-1.4ng/ml → Only start antibiotics if there are strong clinical suspicion of bacteraemia

PCT> 1.5ng/ml → Start antibiotics immediately

Check procalcitonin level every 72 hours

< 60% reduction in PCT post 72hrs → Reassess and escalate antibiotics if required

>60% reduction in PCT after 72hrs → Continue antibiotics, consider stopping antibiotics if PCT <0.5ng/ml

Fig 3 Procalcitonin-guided antibiotic Protocol for suspected bacteraemia in HD patients

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Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

CRD42023422323

Poster number: 092

Submission number: 127

Rate and reasons for peritoneal dialysis dropout following haemodialysis to peritoneal dialysis switch: a systematic review and meta-analysis

Miss Xingge Sun[1], Dr Clare McKeaveney[1], Dr Joanne Shields[2], Chi Peng Chan[2], Matthew Henderson[3], Fiona Fitzell[3], Professor Helen Noble[1], Stephen O'Neill[2,4]

[1]School of Nursing and Midwifery, Queen's University, Belfast, UK. [2]Regional Nephrology & Transplant Unit, Belfast City Hospital, UK. [3]Queens' University, Belfast, UK. [4]Centre of Public Health, Queen's University Belfast, UK

Miss Xingge Sun

Biography
Miss Xingge Sun holds a Bachelor's and Master's degree in Nursing. Xingge is currently a Ph.D. student at the School of Nursing and Midwifery, Queen's University of Belfast. Her research areas of interest include dialysis and kidney transplantation.

Dr Clare McKeaveney

Biography
Dr Clare Mckeaveney (BSc, PhD, MBPsS, CPsychol, AFHEA) is a psychologist and renal researcher. Clare has been a Lecturer at the School of Nursing and Midwifery, Queen's University Belfast, since 2021. She possesses a background in quantitative and qualitative research methodologies. Her work seeks to illuminate the psychosocial impact of renal disease across renal replacement therapies including other topics such as cachexia, patient education and the global implications of COVID-19 within the renal healthcare community.

Stephen O'Neill

Biography
Stephen O'Neill is a Consultant Transplant Surgeon and Clinical Director of Nephrology and Transplantation in Belfast City Hospital. He is also the coordinator for Undergraduate Surgical Teaching in the Belfast Trust. He is an Honorary Senior Lecturer and Lead for Surgery in the Centre of Medical Education Queen's University Belfast. Stephen undertook his Higher Surgical Training in Edinburgh and completed an MSc and PhD in the University of Edinburgh supported by a Medical Research Council Clinical Research Training Fellowship. He won the Association of Surgeons of Great Britain and Ireland Moynihan Prize for his PhD research. Stephen's clinical interests are kidney transplantation and dialysis access surgery. He has been involved in over 100 PubMed indexed publications (42 as either first author or last author

Abstract

Introduction: Patient outcomes can be influenced by dialysis initiation and subsequent modality choices. This study aimed to explore the rate and reasons for peritoneal dialysis (PD) dropout following a haemodialysis (HD) to PD switch.

Methods: This study conducted searches in four databases, including Medline, PubMed, Embase, and Cochrane. The protocol was registered on PROSPERO (ID: CRD42023405718). Outcomes included the rate and reasons for PD dropout and the mortality difference in two groups (PD first group versus HD to PD group). The Critical Appraisal Skills Programme (CASP) checklist and the GRADE tool were used to assess the quality of evidence.

Results: 4971 papers were detected, and 13 studies were included. On meta-analysis, there was no statistically significant difference in PD dropout in the PD first group (OR: 0.81; 95%CI: 0.61, 1.09; I2=83%; P=0.16), however, there was a statistically significant reduction in the rate of mortality (OR: 0.48; 95%CI: 0.25, 0.92; I2=73%; P=0.03) compared to the HD to PD group. Causes for PD dropout differed between the two groups, with psychosocial reasons more common in the HD to PD group. However, inadequate dialysis and peritonitis were the main reasons for PD dropout across both groups.

Discussion: Compared to the PD first group, a previous HD history may not impact PD dropout rates for patients, but it could increase mortality in the HD to PD group. Reasons for PD dropout differed between the two groups, but there were no statistically significant differences. Exploring psychosocial reasons for PD dropout is a valuable area for future research.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

The protocol was registered on PROSPERO (ID: CRD42023405718)

Poster number : 093

Submission number: 231

A protocol-based strategy for safe potassium supplementation to manage refractory hypokalemia in hemodialysis patients

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[1]King Abdulaziz Medical City, Jeddah, KSA. [2]King Saud Bin Abdulaziz University for Health Sciences, Jeddah, KSA

Dr Mohamed Wazeer Mohamed Buhary

Biography
I completed by bachelor's in Medicine and Surgery in 2001. I completed my Senior House Officer training in Medicine in NHS and received my MRCP in 2006. I completed my Registrar training in General Medicine and Renal Medicine in NHS with MRCP (Renal) and CCT in 2012. I was appointed as a Consultant in Renal Medicine and have been practising to date. Currently, I work as a Medical Director for Hemodialysis. My Interests are; Dialysis, Acute Kidney Injury and Critical Nephrology. I am an enthusiast in medical education and hold an adjuvant Assistant Professor role in a leading medical

Abstract

INTRODUCTION: Cardiac arrhythmias remain a leading cause of sudden death among maintenance hemodialysis patients. This has been closely associated with both high as well as low pre-dialysis potassium (K) levels. While hypokalemia is common among peritoneal dialysis (PD) patients, it is rarely encountered among hemodialysis patients. For hemodialysis patients, there are currently no guidelines on how to intervene when pre-dialysis K remain consistently below 4 mEq/L. Typically, these patients are switched to dialysate with K bath of 3 mmol/L along with a potassium-rich diet. However, sometimes, these conventional strategies alone are insufficient. Therefore, for patients on maintenance hemodialysis, a new approach was developed to maintain pre-dialysis K levels above 4 mEq/L, particularly when hypokalemia is refractory to other conventional treatments. This approach involves administering intermittent potassium chloride supplementation orally three times a week on dialysis days with a primary goal of maintaining mid-monthly pre-dialysis K levels with 4 – 6 mEq/L. The current study is to assess the effectiveness and safety of this oral potassium replacement therapy in hemodialysis patients.

Method: This was a single-center retrospective audit study. All adult hemodialysis patients (age > 18 years) with monthly pre-dialysis potassium levels less than 4 mEq/L for three months despite K 3mmol dialysate along with potassium-rich dietary supplements were included. Patients suspected to have potassium-losing tubulopathy, low serum magnesium levels and chronic diarrhoea were excluded from the study.

Patients with pre-dialysis potassium levels between 3.5 - 3.9 mEq/L, were given 10 mmol potassium chloride orally. When the level was less than 3.5 mEq/L, potassium chloride 20 mmol was given orally. This potassium chloride prescription continued for three times a week right before dialysis under direct observation of the dialysis medical staff. Pre-dialysis potassium levels were confirmed by point-of-care blood tests to be less than 4 mEq/L before the potassium chloride administration. The pre-dialysis potassium levels were also monitored every mid-month by laboratory testing.

Results: Five patients met the inclusion criteria. All of the participants on three times-a-week oral potassium chloride supplementation were able to achieve and sustain their pre-dialysis K levels above 4 mEq/L, during the 3-month follow-up period without any incidence of hyperkalemia. On average, over a hundred doses of oral potassium chloride per months has been administered in the last three months without any report of adverse events or intolerability. The following graph illustrates their median K levels before and after the intervention.

Discussion: The short-term results of our intervention were effective and encouragingly safe. It suggests that approaches other than altering dialysate K concentration and dietary K supplementation merit further attention to reduce hazards associated with persistent hypokalemia in hemodialysis. However, we recommend further validation before drawing stronger conclusions about this approach. It's important to note that the study has some limitations, as it is a retrospective analysis and the population involved is relatively small.
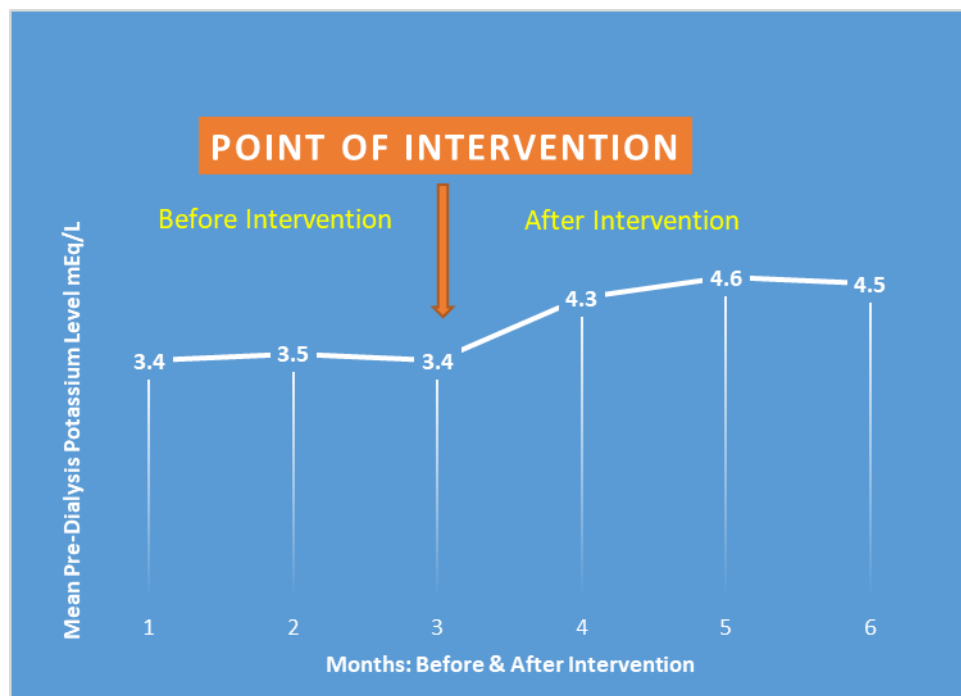
A National Clinical Practice Survey looking at diagnosis, prevalence, and management of "dialyser reactions" in patients with End Stage Renal Failure undergoing haemodialysis.

Dr Duha Ilyas[1,2], Professor Sandip Mitra[1], Dr Leonard Ebah[1], Dr Thomas Lindsay[1]

[1]Manchester Foundation Trust, Manchester. [2]University of Manchester, Manchester

Dr Duha Ilyas

Biography
Nephrology trainee and Clinical Research Fellow currently a PhD student conducting clinical research in Manchester looking at the role of inflammation as a consequence of haemodialysis and patient outcomes.

Abstract

Background: "Dialyzer Reactions" are commonly encountered across the haemodialysis community. The exposure of a patient's blood to the dialysis membranes, even though considered "biocompatible", has been recognised as the cause for several decades. Despite advances in technology, clinicians continue to see these "pseudo-anaphylactic" reactions, also known as Type B reactions in modern day practice. Its underlying pathophysiology is activation of complement cascade, an integral part of the innate immune system. There is now a growing wealth of data linking immune reactivity to chronic inflammation in haemodialysis patients, the consequences of which include increased cardiovascular morbidity and mortality. It is due to the ambiguity of "dialyser reactions" which lead to great variation in recognition and management of these patients. Defining best clinical practice lies at the crux of the solution.

We conducted a national survey to better understand the prevalence, diagnosis and management of patients experiencing 'dialyser reactions' in attempt to define best practice.

Methods: An online survey was disseminated through the UK Kidney Association and Dialysis Society over a 6-month period. All responses were voluntary, and participants were invited to document the practice of their respective dialysis units. The online survey was conducted using Qualtrics™ and data analysis using Qualtrics™ Stats iQ and Microsoft^{0} Excel Version 16.80.

Results: 35 responses were received from 22 of the 52 renal units in England (42%), one from Scotland, with a spread of main and satellite units. Responders included nephrology trainees, consultants/clinical directors and dialysis nurse practitioners.

87% of units responded at between 20 and 30% of their patients are using their second-choice dialyser following a switch from the primary dialyser.

Polysulfone was the dialyser of choice with 100% of units in this survey using them (from two manufacturers). First dialyser choice was by defaulting to standard practice in 81% of cases and clinical factors were specifically reported to influence decision in 31% (Figure 1).

88% of respondents reported being exposed to (diagnosed or managed) "dialyser reactions", with 15%, seeing this at least monthly (Figure 2). Hypotension (83.9%) and respiratory distress (74.2%) occurring within the first 30 minutes of treatment were most frequently reported.

Almost two thirds (61%) of respondents proceeded to switching dialysers after clinically observing putative dialyser reaction symptoms (Figure 3). All units did not formally investigate, although 3 in 4 respondents will simultaneously carry out confirmatory tests; mostly mast cell tryptase (21%) and white blood cell counts (21%).

Conclusion: With up to a third of patients reporting the use of an alternative dialyser, our findings suggest "dialyser reactions" are a frequently encountered phenomenon. Great disparity exists in the approach taken to investigate and manage this cohort of patients. We draw focus on a largely unresolved issue affecting a significant proportion of our haemodialysis population and the need for more quantitative data to understand the magnitude of "dialyser reactions".

Furthermore, the lack of evidence-based treatment options leads to clinicians practicing a trial-and-error based approach in attempt to alleviate patient symptoms. Greater research into this field will not only build clinician insight but also encourage development of new therapeutic options to better manage at risk
patients.
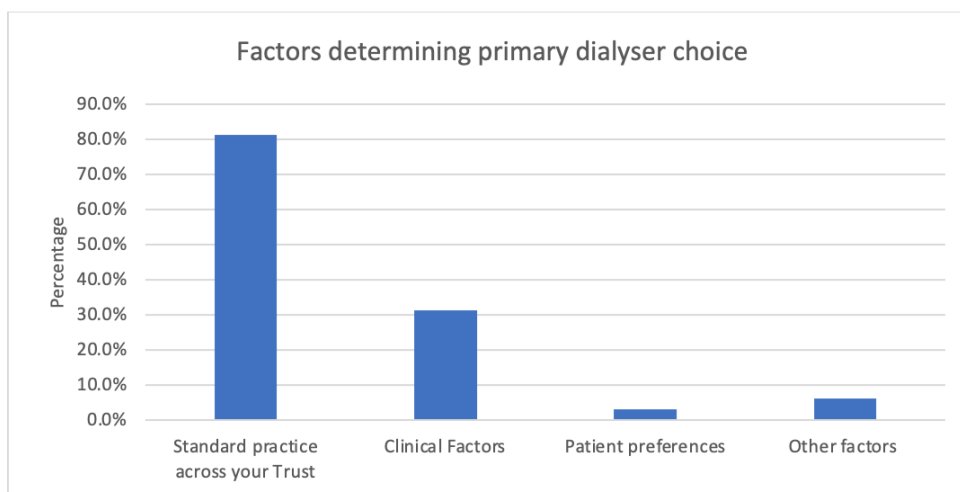
Figure 1: The choice of dialyser when prescribing haemodialysis is most often based on standard practice across the trust followed by clinical factors (81.3% and 31.3% respectively).
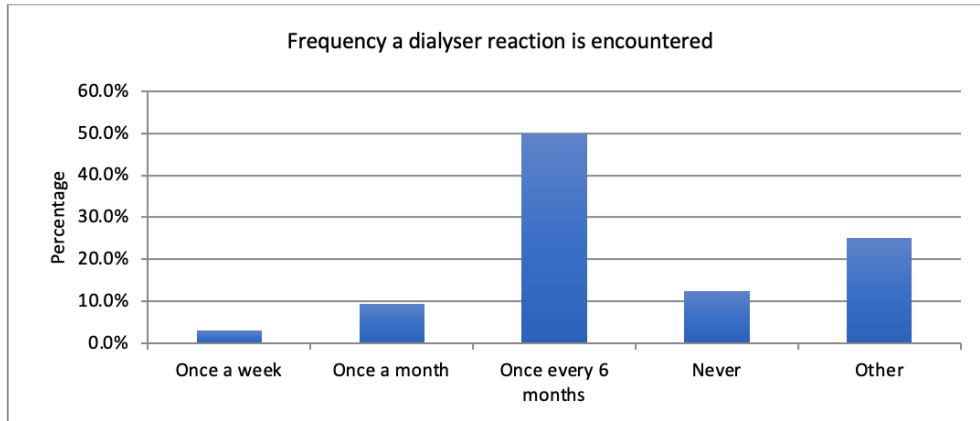
Figure 2: Frequency at which dialyser reactions were encountered by respondents. In over 15% of cases, this was reported to be at least monthly and up to weekly in some cases.
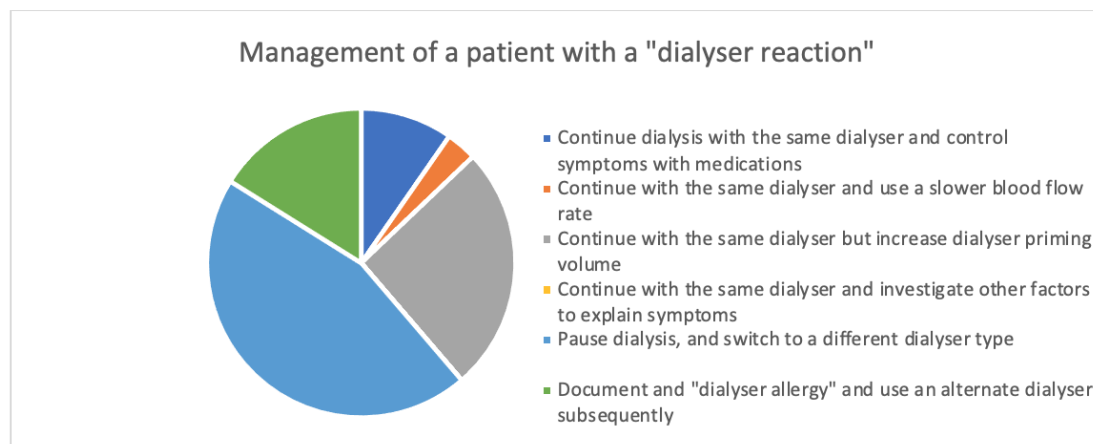
Figure 3: Management of patients experiencing dialyser reaction showing that patients are most often managed with a switch of dialyser. This is reported in over 61% of cases.

Poster number: 095

Submission number: 318

A systematic review of the risk factors for unplanned dialysis initiation

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[1]UK Renal Registry, UK Kidney Association, Bristol, UK. [2]University of Bristol, Population Health Sciences, Bristol, UK

Miss Winnie Magadi

Biography
Winnie Magadi is a statistician working at the UK Renal Registry and is also currently undertaking her PhD part-time at the University of Bristol. Her academic background includes completing an MSc in Epidemiology and Biostatistics at Leeds University in 2013. She has spent a number of years working in the fields of statistics and health, which includes her previous role as a Researcher in the Cancer Survival group at LSHTM. Her current research interests include examining clinical care pathways for patients with chronic kidney disease, and modelling their outcomes.

Abstract

Introduction: The current evidence on the modifiable risk factors for unplanned dialysis initiation is inconclusive. This requires attention given that starting dialysis in an unplanned manner is associated with higher mortality among patients with end-stage kidney disease (ESKD). While early referral to a nephrologist has been reported as a key factor in reducing early mortality after dialysis, unplanned dialysis and the poor outcomes associated with it, occurs in both late and early referrals.

In 2019, Hassan et al. published a comprehensive review on the risk factors for unplanned dialysis initiation and showed that well designed studies on the subject are lacking. Thus, we conducted an updated systematic review to examine the risk factors for unplanned dialysis initiation.

Methods: We adapted the search strategy developed by Hassan et al. and limited our search to studies published from 1st January 2018 to 23rd August 2023 (the previous review was from inception to 2017). A systematic search of the following electronic databases was conducted by WM, SS and KB, to identify potentially eligible published papers: Ovid MEDLINE(R) and EMBASE. Data were extracted from all studies identified and went through multiple rounds of screening for relevance, beginning with the titles, abstracts, and full text. Meta-analyses of the most common risk factors were then performed (where data permitted), to obtain pooled estimates of the association with the outcome.

Results: In total, there were 3,678 studies identified from the search using the two databases. After several rounds of screening, 18 international studies (most of which were based in Europe) were found to meet the eligibility criteria. The most common risk factors were found to be presence of cardiovascular disease, age, cancer, diabetes, lower serum albumin, cause of kidney disease and a reduced number of nephrology visits prior to dialysis initiation (table 1). Those grouped under 'added'

were factors not reported by Hassan et al. A meta-analysis of cardiovascular disease, the most common risk factor for unplanned dialysis in our review, is presented in figure 1. While the effect estimates appear to be similar, we observed a lot of heterogeneity in the data regarding how the disease was measured across studies. Further, the included studies adopted varied definitions of unplanned dialysis starts (see figure 2).

Discussion: The most common predictors of unplanned dialysis initiation identified were in line with those reported by Hassan et al., and in other reviews published prior. However, we highlighted several other important factors associated with unplanned dialysis initiation, which have not been well studied. These ranged from social factors to factors related to nephrology care, such as presence of a CKD code in GP records prior to dialysis start, health literacy and having an acute kidney injury. Many of the included studies were well designed, utilising very large datasets i.e., national registries, and conducted adjusted multivariate analyses to examine the associations.

Our review provides new insights into reasons why people start dialysis acutely, many of which are modifiable, thus contributing to efforts in reducing the rate of unplanned dialysis initiation.

Table 1: Risk factors associated with unplanned dialysis initiation (UDI).

	Variable	No. of studies associated with UDI	Notes
Demographics	Age	6	Two studies found that younger age was associated with UDI, while the remaining studies showed an association between increased age and the
	Sex (Male)	3	Two studies showed that male sex is associated with a higher risk of UDI, while one found that females had the higher risk
	Low SES and rural residence	1	
Comorbidities	Cardiovascular disease	9	
	Diabetes	5	
	Cancer	5	
	Cause of kidney disease	4	The risk of UDI was lower in patients who had vascular renal disease or PKD as their PRD when compared to 'unknown' or 'other' renal disease
	Chronic obstructive pulmonary disease	3	
	Comorbidity score	3	A higher count of long term health conditions (excluding CKD) was associated with UDI
	BMI/Weight	2	One study showed that overweight individuals were less likely to have an UDI, and another showed the opposite effect
	Higher blood pressure/Hypertension	2	One study found that hypertensives are less likely to have a UDI, and the other found the opposite effect
	Peripheral vascular disease	1	
	Smoking	1	
Biochemistry	Serum Albumin	4	
	Haemoglobin	2	
	Urea	1	
Nephrology care	Number of nephrology visits	4	
	Rate of eGFR decline	3	
	Late referral	2	
	Time from RRT discussion and dialysis start	2	
	Time known to nephrology	1	
Medications	Renin angiotensin (RAS) inhibitors	1	The use of RAS inhibitors is significantly associated with a lower incidence of UDI
Added	Respiratory disease	3	
	Mobility	2	Those who are less mobile are more likely to have an unplanned start
	Acute kidney injury	2	
	Potassium binders	1	
	Season (Winter)	1	UDI was significantly more frequent in the winter than in the remaining seasons
	Living alone	1	
	Low health literacy	1	
	Exposed to hyperpolypharmacy	1	
	Cachexia	1	
	C-reactive protein levels	1	
	Acidosis	1	
	Other electrolyte disorders	1	
	Non-Steroidal Anti-Inflammatory Drugs use	1	
	ICA use within 7 days of starting dialysis	1	
	Creatinine monitoring	1	Late/absence of creatinine monitoring were associated with higher risk of UDI
	Nephrology related hospital stays	1	
	RRT preparation (definitinive access)	1	Those with a record of fistula or PD catheter procedures were less likely to have an UDI than those with other access types
	CKD coded prior to RRT	1	Those with no CKD code prior to start were much more likely to have an UDI
	Prescribed statins in the 6 months prior to RRT	1	Those who were not prescribed this medication were at a higher risk of UDI
	GP consultations in the year prior to RRT	1	
	Hepatitis B vaccination ever prior to RRT	1	Those who never had this vaccine prior to RRT start were at a much greated risk of UDI
	Number of physical disabilities	1	The percentage of patients with physical disabilities was higher in areas/clusters with people at a lower risk of UDI
	Stable inhabitants	1	Those who stay longer at the same residence are more likely to have an UDI
	Living in urban areas	1	One study found a decreased likelihood of UDI in patients living in Rome
	Attended private heamodialysis units	1	
	Liver disease	1	

Positive association	Negative association	No clear association
UDI - Unplanned dialysis initiation	RRT - Renal replacement therapy	PD - Peritoneal dialysis
PRD - Primary renal disease	PKD - Polycystic kidney disease	HD – Haemodialysis

Figure 1: A meta-analysis of cardiovascular disease as a risk factor for unplanned dialysis initiation.

Study	Odds ratio (95% CI)	% Weight
Holland and Lam 2000	2.90 (1.20, 6.90)	1.92
Brown et al. 2015	1.50 (0.70, 3.30)	2.40
Arulkumaran et al. 2019	2.00 (1.20, 3.10)	5.75
Raffray et al. 2020	1.90 (1.60, 2.30)	20.06
Shimizu et al. 2020	7.00 (1.90, 31.20)	0.77
Fages et al. 2021	1.30 (0.80, 2.10)	5.60
Heaf et al. 2021	1.40 (1.00, 2.00)	9.43
Petureau et al. 2021	2.00 (1.70, 2.30)	23.06
Tazza et al. 2021	1.60 (1.40, 1.80)	25.77
Tachikart et al. 2023	1.70 (1.10, 3.00)	5.24
Overall, DL (I^2 = 37.0%, p = 0.113)	1.77 (1.56, 2.00)	100.00

NOTE: Weights are from random-effects model

Figure 2: Reported definitions of unplanned dialysis initiation.

- ■ Access type 27.8%
- ■ Under emergency conditions 38.9%
- ■ Time known to renal services 16.7%
- ■ Dialysis initiation during hospitalisation 5.6%
- ■ Access type & emergency conditions 11.1%
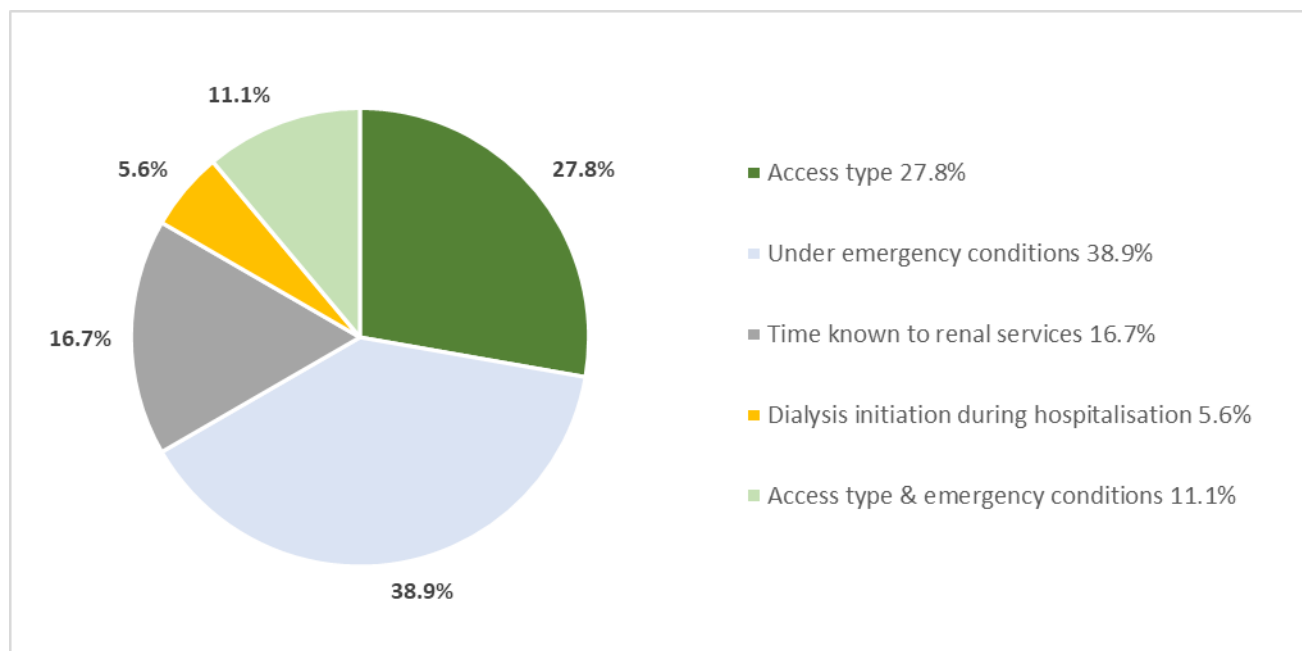
Poster number: 096

Submission number: 319

A protocol-based IV administration of calcium gluconate for chronic hypocalcemia in hemodialysis patients after parathyroidectomy in an outpatient setting.

Dr Mohamed Wazeer Mohamed BUhary[1,2], Dr Syad Fahad[1], Dr Masarra Abdulwahab[1], Dr Essam Kadih[1], Dr Ahmed AlMukhtar[1], Dr Abdurrahman Husny[1]

[1]King Abdulaziz Medical City, Jeddah, KSA. [2]King Saud Bin Abdulaziz University for Health Sciences, Jeddah KSA

Dr Mohamed Wazeer Mohamed BUhary

Biography
I graduated with a bachelor's in medicine and surgery in 2001. I completed my Senior House Officer training in medicine and received my MRCP in 2006. I completed my Registrar training in General Medicine and Renal Medicine with MRCP(Renal) and CCT in 2012. I was appointed as a Consultant in Renal Medicine and have been practising to date. Currently, I work as a Medical Director for Hemodialysis. My Interests are; Dialysis, Acute Kidney Injury and Critical Nephrology. I am an enthusiast in medical education and hold an adjuvant Assistant Professor role too. I also take an active role in teaching and training SHOs and Renal Registrars.

Abstract

INTRODUCTION: Hyperparathyroidism is highly prevalent among patients on hemodialysis. Despite advancements in the medical management of this condition, many patients will eventually need to undergo parathyroidectomy. Parathyroidectomy is often followed by hypocalcemia (defined as adjusted calcium level less than 2.2mmol/L). There are several algorithmic guidelines to manage this pre-emptively in the acute setting. UK Kidney Association (UKKA) recommends maintaining pre-dialysis adjusted calcium (adjCa) levels within 2.2 – 2.6 mmol/L. Despite the pre-emptive measure if the adjCa falls below this range, conventionally, these patients are switched to a dialysate with high calcium bath of 1.75 mmol/L along with vitamin D preparations and oral calcium tablets. However, due to the high pill burden many patients on hemodialysis struggle to comply with the huge number of calcium pills leading to chronic hypocalcemia and its associated long-term complications. In hemodialysis patients, there are no recommended interventions to manage chronic hypocalcemia and associated repeated hospital admissions for intravenous (IV) calcium gluconate treatment. This requires developing a new therapeutic approach. We started administering IV calcium gluconate in the outpatient dialysis unit itself to patients who were identified to be chronically hypocalcemia with an intention to maintain pre-dialysis adjCa within UKKA recommended range. The current study assesses the safety and effectiveness of intradialytic IV calcium gluconate therapy in outpatient hemodialysis patients with chronic hypocalcemia.

Method: This is a retrospective observational audit study. The study included adult hemodialysis patients who were over 18 years old and had undergone parathyroidectomy within the last 12 months. These patients had pre-dialysis adjCa levels of less than 2.2 mmol/L for three consecutive months. All participants were already receiving maximum conventional treatment with high calcium bath of 1.75 mmol/L dialysate, vitamin D preparations and oral calcium pills as needed, at the discretion of the physician, to maintain adjCa levels within the range of 2.2 to 2.6 mmol/L.

Throughout the next six months, each participant was administered a maintenance dosage of 10ml of 10% IV calcium gluconate at the end of each dialysis session thrice a week. adjCa levels were tested middle of every month.

Results: Nine patients met the inclusion criteria. All of the participants on three times a week IV calcium gluconate were able to achieve and sustain their pr-dialysis adjCa level above 2.2 mmol/L

Nine patients met the inclusion criteria. All of the participants on three times-a-week IV cal-glu supplementation were able to achieve and sustain their pre-dialysis K levels above 2.2 mmol/L during the 6-month follow-up period without any incidence of hypercalcemia. None required hypocalcemia related hospital admissions. The following graph illustrates median adjCa levels before and after the intervention.

Discussion: The results of our intervention in the short-term were effective and showed promising safety. This suggests that alternative methods like intradialytic IV calcium gluconate are safe to use in outpatient settings and deserve further attention in the hemodialysis population who struggle to comply with oral preparations. This approach could also potentially prevent potential hospitalization for intravenous calcium therapy. However, we recommend further validation before drawing stronger conclusions about this approach. It's important to note that the study has some limitations, as it is a retrospective analysis and the population involved is relatively small.

POINT OF INTERVENTION

Mean Adjusted calcium levels

1.88 — 1.85 — 1.90 — 2.2 — 2.3 — 2.4 — 2.3 — 2.3 — 2.4

1   2   3   4   5   6   7   8   9

Months
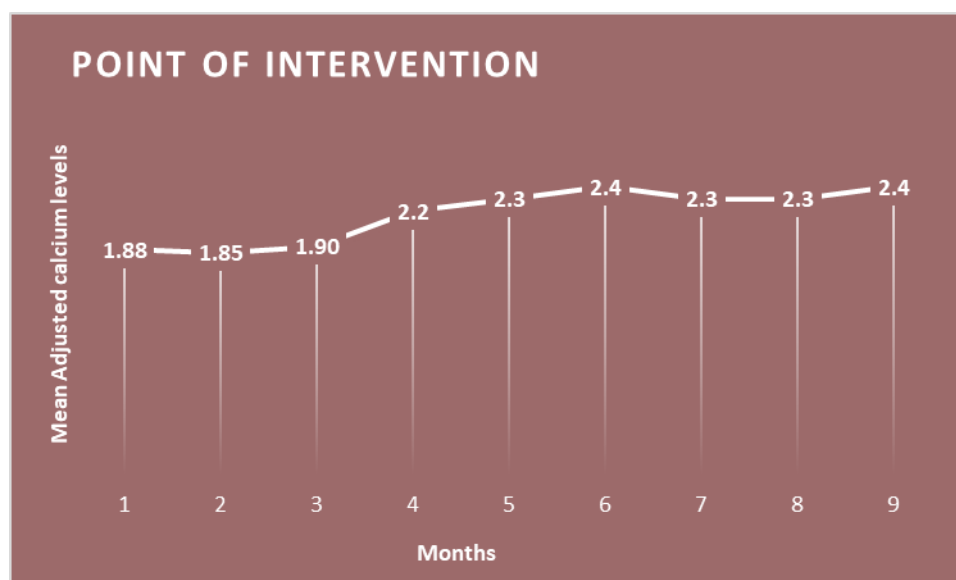
Poster number: 097

Submission number: 348

Risk factors associated with unplanned dialysis initiation in patients known to renal services: a case-control study

Dr Tony Lopez, Dr Damien Ashby

Renal Medicine, Imperial College Healthcare NHS Trust, London

Dr Tony Lopez

Biography

I am an Internal Medical Trainee working at Imperial College Healthcare NHS Trust. I am an aspiring Nephrologist, having completed Senior House Officer jobs at two tertiary renal units in London: Hammersmith and St George's. Prior to IMT I was a Renal Academic Foundation Trainee at St George's and worked on the LiFT and CARSK trials.

Abstract

Introduction: Unplanned dialysis initiation (during an emergency hospital admission) is associated with increased complications, more temporary access, and higher mortality compared to planned initiation.[1] Studies have identified late referral to renal services as a predictor of unplanned initation[2], but even in patients known to nephrologists, more than one-third start dialysis in an unplanned fashion.[3] This study compared patients following planned and unplanned dialysis initiation, in an attempt to characterize factors that predict unplanned initiation in patients known to renal services.

Methods: This was a single-centre retrospective case-control study amongst patients known to the renal service. Consecutive patients with unplanned dialysis initiation between March 2023 and September 2023 were selected as cases (unplanned patients). Age and gender matched controls were selected from patients with planned initiation between January 2022 and September 2023 (planned patients). Data were collected from electronic patient records and clinic letters. Between group comparisons were performed on biochemical, medical, and healthcare variables in the 12 months prior to dialysis initiation. A multivariable logistic regression model was used to identify independent predictors of unplanned initiation.

Results: There were 40 patients in each group (age 60±14 years, 85% male). The groups were no different in terms of GFR at dialysis initiation, or proteinuria in the 12 months prior to initiation. In unplanned patients, during the 3 to 12 months preceding dialysis initiation, GFR declined more quickly (1.8±2.2 vs 0.9±0.8 ml/min/1.73m2/month, p=0.045) and weight gain was greater (1.1±1.6 vs -0.2±1.5 %/month, p<0.001) than in planned patients. Unplanned patients also had more emergency hospital admissions (1.2±1.0 vs 0.7±0.8, p=0.031), missed more nephrology clinic appointments (1.2±1.6 vs 0.7±1.6, p=0.007) and made later modality decisions (2.0±4.0 vs 4.1±4.9 months before dialysis, p<0.001). In a multivariable logistic regression model, the independent predictors of unplanned initiation were GFR slope (OR 1.78, 95%CI 1.00-3.12), weight gain (OR 2.00, 95%CI 1.33-2.99) and clinic non-attendance (OR 1.51, 95%CI 1.06-2.13).

Discussion: Patients starting dialysis during an emergency hospital admission are not identifiable by traditional kidney failure predictors, such as GFR and proteinuria. Those at risk of unplanned initiation are characterised by faster GFR decline, greater weight gain, emergency hospital admissions and non-attendance in nephrology clinics. These findings may help clinicians identify and support individuals at risk, thereby preventing unplanned dialysis initiation. In particular, this study highlights fluid control and timely decision-making, as modifiable factors which may reduce an individual's risk

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MRI assessment of skin and muscle sodium ([23]Na) and fluid volume in haemodialysis patients

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Dr Ben Prestwich

Biography
Dr Ben Prestwich is a MR physics Research Fellow at the Sir Peter Mansfield Imaging Centre University of Nottingham, working in the field of sodium MRI. His PhD was entitled "Implementation of 23Na MRI", where he worked to setup the hardware and techniques to enable sodium (23Na) MRI in-vivo of the abdomen, muscle and skin. His current research is to develop 23Na MRI acquisition and analysis techniques and apply these methods in muscle, kidney and the brain in healthy subjects. Alongside this, his goals are to implement 23Na MRI in clinical studies of patient groups including haemodialysis patients, in addition to investigating the effects of fluid replacement therapies.

Abstract

Introduction: Haemodialysis (HD) is life sustaining for patients with end-stage kidney disease (ESKD). In healthy people, sodium balance is regulated by the kidneys; in ESKD this is achieved by sodium removal during HD. Recent evidence suggests non-osmotically stored sodium in the muscle and/or skin may be a critical factor impacting the development of hypertension and cardiovascular disease (CVD)[1,2]. Sodium ([23]Na) MRI allows skin and muscle sodium storage assessment and may provide a valuable tool in evaluating sodium storage in dialysis patients[3,4,5]. Here, [23]Na MRI is used to measure muscle and skin tissue sodium concentration (TSC) in HD participants. HD participants are scanned before and after a single haemodialysis session using [23]Na MRI as well as [1]H T_2 relaxometry to study changes in fluid status.

Methods: Data were collected on HD patients who underwent a pre-HD [23]Na MRI calf scan, then had their usual dialysis session with a dialysate sodium of 137 mmol/L, followed by a repeat post-HD [23]Na MRI scan. Patient dialysis vintage, residual renal function, and ultrafiltration volume, and blood measures pre- and post-HD were collected. [1]H scans were acquired for localisation and muscle segmentation (mDIXON) along with T_1 and T_2 mapping. [23]Na images were acquired for (TSC) quantification. Reference bottles (10, 20, 30 and 40mmol/L NaCl) were placed above the leg to calibrate TSC muscle and skin maps. Regions-of-interest (ROIs) of each muscle group and the skin were manually segmented on mDIXON scans. In each muscle group the voxel-wise mode (to avoid influence of signals from vessels) of TSC and T_2 was estimated. A paired-sample t-test was performed between metrics pre-HD and post-HD. Absolute measures of ΔTSC and ΔT_2 were correlated with clinical measures (Table 1).

Subject ID	Age (yrs)	Serum Na (mmol/L) Pre-dialysis	Serum Na (mmol/L) Post-dialysis	Actual ultrafiltration (ml)	Blood pressure (mmHg) Pre-dialysis Systolic	Blood pressure (mmHg) Pre-dialysis Diastolic	Blood pressure (mmHg) Post-dialysis Systolic	Blood pressure (mmHg) Post-dialysis Diastolic	Time on RRT (days)	Residual urine output (Y=1)
1	55	138	137	1960	150	94	121	78	174	1
2	60	145	141	1490	153	92	148	88	323	0
3	68	139	143	1960	194	62	153	83	752	1
4	58	140	137	1900	161	85	165	92	211	1
5	54	140	141	2340	159	88	157	103	714	1
6	58	136	136	2420	170	72	122	55	213	1
7	73	136	136	2770	205	87	145	68	3059	0
8	56	140	140	2330	162	85	154	80	491	0
9	55	137	138	2450	137	85	108	62	688	1
10	55	136	138	990	135	78	144	74	730	0

Table 1: Haemodialysis patient demographics and clinical measures.

Results: Ten people receiving HD were recruited (age 55-73 yrs, 5M:5F). Figure 1 shows TSC maps of the HD patients pre-HD and post-HD, with a significant reduction ($p<0.05$) in TSC in the extensor, peroneus and gastrocnemius muscles post-HD but skin sodium showed no detectable change. Post-HD TSC significantly positively correlated with post-HD Systolic Blood Pressure (SBP) ($P<0.004$) but not with plasma sodium. ^{1}H T_2-maps (Fig.2A) show a significant reduction ($p<0.01$) in muscle T_2 post-HD compared to pre-HD all muscle groups (Fig.2B). There were no significant correlations between T_2 and ^{23}Na measures, or T_2 and clinical measures. There was no significant detectable change in ^{1}H T_1.
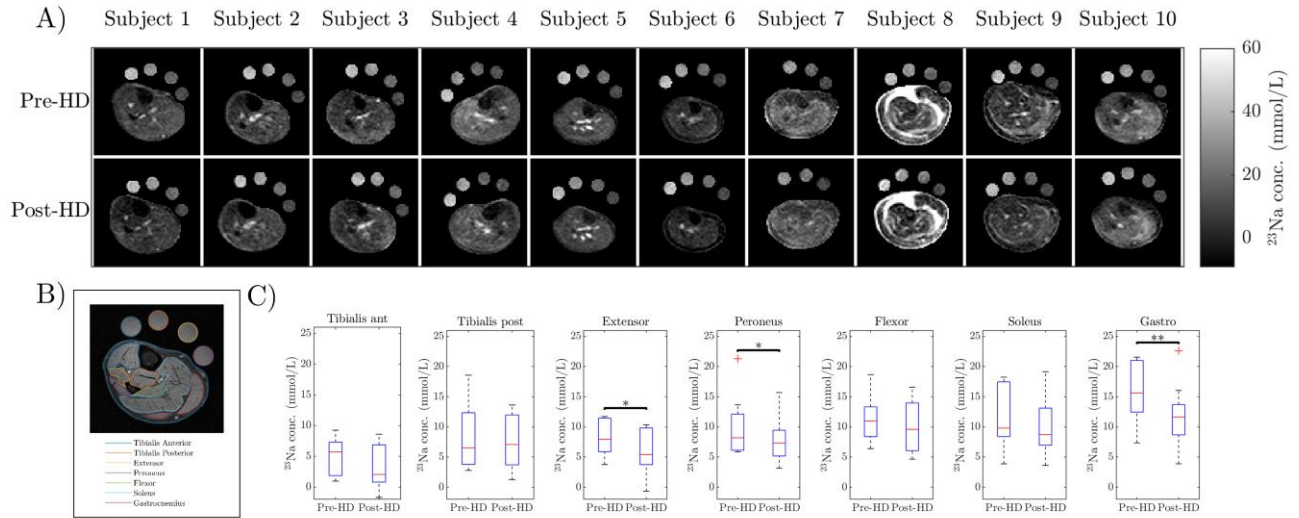
Figure 1: (A) Maps of tissue sodium concentration (TSC) for the haemodialysis (HD) patients collected pre-HD and post-HD. The four reference bottles (10, 20, 30 and 40mmol/L NaCl) can be seen above the leg. Note the high TSC in Subject 8, a patient who had a failed transplant and returned to dialysis, and had subcutaneous adipose tissue oedema. (B) ^{1}H MRI mDIXON scan showing the segmentation of the muscles. (C) TSC of each muscle group pre-HD and post-HD, with significant reductions seen post-HD in the extensor, peroneus and gastrocnemius muscles (Subject 8 excluded). *$p<0.05$, **$p<0.01$, **$p<0.001$.
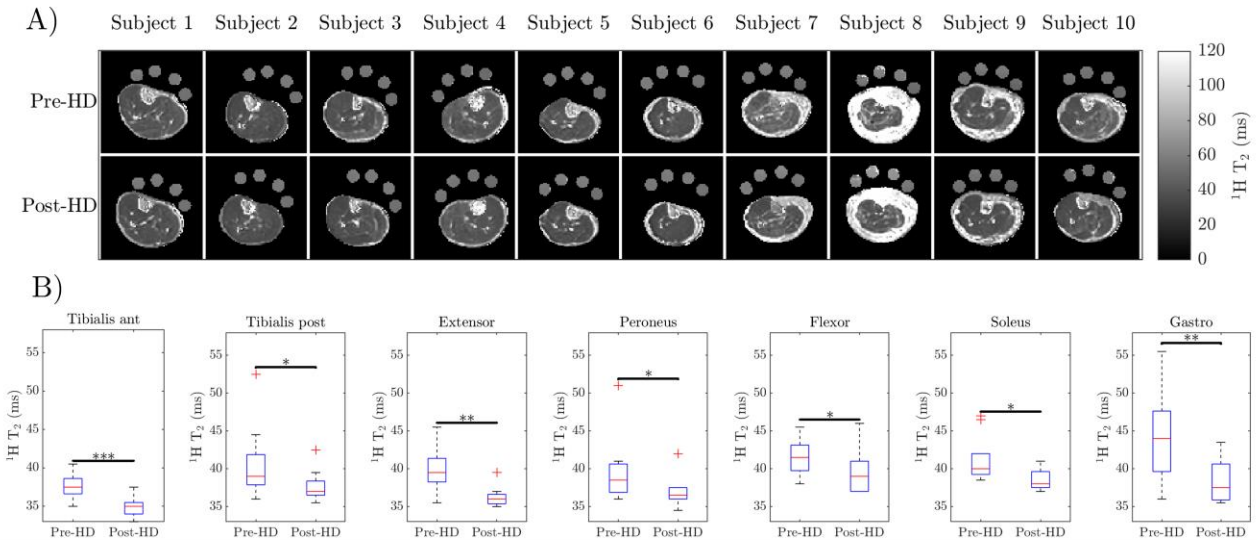
Figure 2: (A) ^{1}H GraSE T_2 maps for the haemodialysis (HD) patients pre-HD and post-HD. Note the high T_2 in Subject 8, a patient who had a failed transplant and returned to dialysis. (B) T_2 of each muscle group pre-HD and post-HD, with a significant reduction in T_2 for all muscle groups seen post-HD (Subject 8 excluded). *$p<0.05$, **$p<0.01$, **$p<0.001$.

Discussion: Post-HD TSC values are consistent with published data from patients dialysed against a dialysate sodium of 137 mmol/L, and corresponds with Lemione *et al.*[4] in showing a significant correlation of post-HD TSC with post-HD SBP. ^{1}H muscle T_2 reduced post-HD, consistent with published data[7], as patients change from a pre-HD hypervolemia state closer to a post-HD to euvolemia state after fluid removal. There was no correlation of absolute or DTSC and ^{1}H T_2 and DT_2 values, suggesting different mechanisms for equilibrium conditions of water and sodium ion concentrations. Future studies

will study the effect of dialysate sodium on muscle TSC and mechanistic links to CVD, and include the use of a dedicated skin coil[8,9] to study skin sodium alongside bioimpedance fluid measures.

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Poster number: 099

Submission number: 531

BACTERAEMIAS IN HAEMODIALYSIS – DID THE COVID PANDEMIC HAVE AN EFFECT?

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Dr Olusegun Olalowo

Biography
Olusegun Olalowo is a highly skilled and passionate medical professional dedicated to improving the lives of patients through commendable healthcare and research. Born on the 15th of November in Ogun state, Nigeria, Olusegun developed a passion for medicine in the early phase of his life, inspired by a desire to make a meaningful impact on individuals and his community. Olusegun had his primary and secondary education in Ogun State Nigeria before proceeding to the College of Medicine, University of Ibadan where he earned his MBBS degree in 2010. He completed his internship at State Hospital Abeokuta, Nigeria where he honed his clinical skills. Olusegun is fully registered with the Medical and Dental Council of Nigeria and the General Medical Council in the UK having fulfilled the necessary criteria required of an international medical graduate. Currently, he is a Junior Clinical Fellow at St Helier Hospital renal unit. He is a sportsman, an ardent lover of football and a Real Madrid fan. Olusegun is known for his warm bedside manner and genuine concern for patients' well-being. His ability to communicate complex medical information in an accessible manner fosters a strong doctor-patient relationship, instilling confidence and trust.

Abstract

Introduction: The COVID 19 pandemic caused a global health crisis with a profound increase in hospital admissions especially in patients with various underlying health conditions. Patients on renal replacement therapy (RRT) were deemed particularly vulnerable, not just for COVID but also, bacterial infections, which are a common cause of morbidity and mortality in this group of patients. This study is aimed at identifying the incidence and pattern of bacteraemias in patients on haemodialysis (HD) during and after the COVID-19 pandemic.

Methods: We retrospectively reviewed patients on HD who had bacteraemias between May 2019 and December 2023. Data collected using an electronic database included the type of RRT and blood culture results. Statistical analysis was done with Microsoft Excel.

Results: There were 481 bacteraemias during the study period, of which 411 (85%) were from patients undergoing HD. There was a 12% increase in the HD population from 872 to 982 between 2019 and

2023. The percentage of bacteraemias per HD population rose from 6% in 2019, peaked at 9% in 2020 and fell over the next couple of years to 5% in 2023 (figure 1).

We looked at the types of organisms isolated. Gram positive organisms accounted for 78% of the total. There was no significant difference in the annual incidence of Gram negative (20-27%) or Gram positive organisms (71-80%) over the period. There was an increase in the incidence of enterococci between 2019 (2%) and 2020 (15%). This fell to 4% in 2022 and was 9% in 2023.

Conclusion: We found an increase in the incidence of bacteraemias in the study population at the height of the COVID-19 pandemic in 2020, compared to the pre-pandemic period. The reason for this is not clear from our data. It is not likely to be due to an increase in the at-risk population, as the size of the HD program increased consistently over the period, but the bacteraemias peaked in 2020 and then fell over the next couple of years. It is possible that the disruption to various services and the strain on the healthcare system in 2020 may have contributed to the initial rise in bacteraemias. It is encouraging to see, however, that the incidence has fallen back to pre-pandemic levels.

Proportion of bacteraemias in HD patients
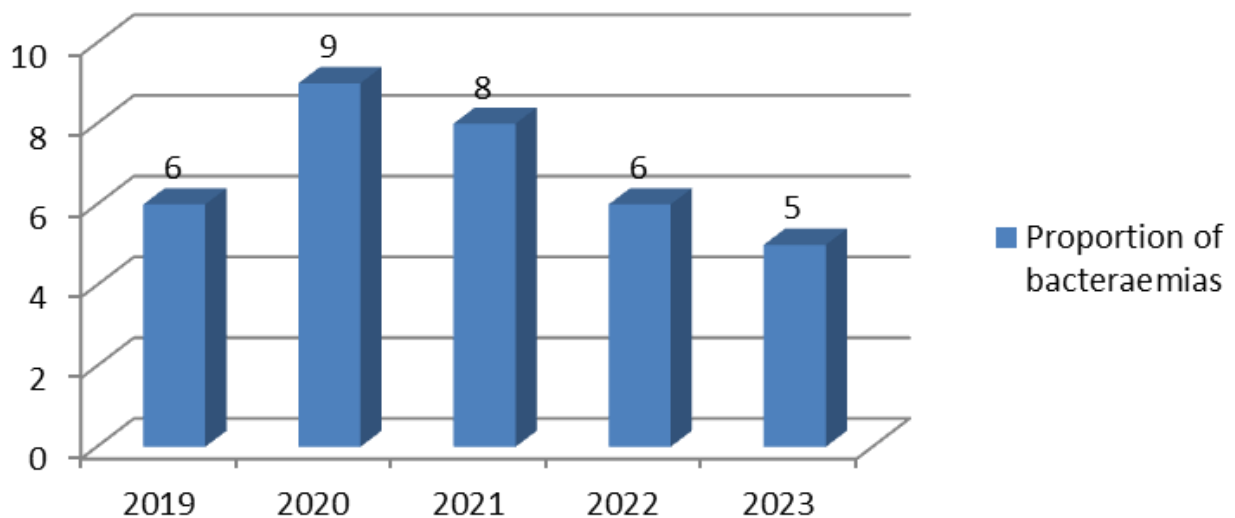
Poster number: 100

Submission number: 598

Dialysis after graft loss: preliminary findings of a large multi-national database.

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Dr Oshini Shivakumar

Biography
I am a Nephrology trainee, currently pursuing research at the Institute of Global Health Innovation at Imperial College London. I graduated from Imperial College London, having completed pre-clinical training at the University of Cambridge. I wish to pursue an academic career in Nephrology with special interest in Advanced Kidney Care for both native and transplanted kidneys. I am multi-lingual, and I recognise the value of diversity and respect equality. I enjoy my role as the secretary of the Dialysis Research and Innovation Group(DRIG) at the Imperial College Renal and Transplant Centre, London. Sri Lanka is important to me as my home country, but has also taught me the value of medical research and innovation. Having witnessed people being treated in a resource poor environment, it is crucial to get it right the first time, and propelled an interest for Global Health. Spending time with my friends and family, playing the piano, swimming and hiking play a significant role in retaining my focus and enthusiasm for the work I am passionate about. No conflict of interest to declare.

Abstract

Introduction: Kidney transplant failure contributes to a considerable proportion of new dialysis starters. In some centres there are dedicated clinics for patients with failing kidney transplants. However, the specific needs of patients with dialysis after graft loss (DAGL) may be lost in the non-specific clinical review practiced in the general dialysis community. This study examines the mortality and morbidity risk in patients returning with DAGL and compares it to transplant-naïve (T-N) dialysis starters, to determine if the former warrant a more specialised approach.

Methods: This is a retrospective observational study of mortality in all adult patients who started dialysis treatments in Fresenius Medical Care (North America, Latin America, Europe, Middle East, Africa, and Asia Pacific) from 1st January 2018 to 31st March 2021, identified in the Apollo Dial DB dataset. DAGL was identified from the ICD-10 codes 'Kidney transplant failure', 'Unspecified complication of kidney transplant' and 'Other complication of kidney transplant' at dialysis start. The T-N control group had not previously received a kidney transplant and had not received immunosuppressive medication during the first six months of dialysis start.

The first six months on dialysis were defined as baseline, months 7 to the end of year 5 were defined as the follow-up period. All-cause mortality was recorded during follow-up. Cox proportional hazards models were applied to explore the association between DAGL and all-cause mortality.

Results: A total of 360,469 dialysis starter patients from 41 countries were included in the analysis. 10,010 patients had DAGL and were compared with 350,459 in the T-N control group. In univariate analysis, DAGL patients were significantly younger in all age categories and, had a higher proportion of male sex. Serum creatinine, ferritin, phosphate and neutrophil-to-lymphocyte ratio were higher in the DAGL group. Haemoglobin was lower in the DAGL group (Table 1).

Table 1. Summary of patient characteristics in the study group and control group.

Table 1			
	Transplant naïve (T-N) dialysis starters	Dialysis after Graft Loss (DAGL) dialysis starters	P-value
	N = 350,459	N = 10,010	
Age [years]			
18-44	5,6507 (16%)	3,805 (38%)	<0.0001
45-64	143,221 (41%)	4,488 (45%)	<0.0001
65-74	85,312 (24%)	1,372 (14%)	<0.0001
>=75	65,419 (19%)	345 (3%)	<0.0001
Male [%]	204,615 (58%)	5,984 (60%)	0.0222
Serum Albumin [g/dL]	3.5 (0.5)	3.5 (0.4)	<0.0001
Serum Creatinine [mg/dL]	6.2 (2.6)	7.0 (2.9)	<0.0001
Ferritin [ng/mL]	580 (568)	729 (550)	0.0435
Hgb [g/dL]	10.2 (1.2)	10.0 (1.1)	<0.0001
Serum phosphate [mg/dL]	5.0 (1.3)	5.3 (1.3)	0.0073
NLR	5.5 (23.0)	6.5 (13.4)	<0.0001
MLR	0.5 (1.6)	0.5 (0.4)	<0.0001

Hgb = Haemoglobin. NLR = Neutrophil-to-lymphocyte ratio. MLR = Monocyte-to-lymphocyte ratio

In the Cox proportional model adjusted for age, gender, and other laboratory and clinical markers, patients with DAGL had an equivalent survival probability compared with T-N dialysis starters (HR:0.93,

95% CI: 0.86, 1.02) (Table 2).

Table 2. Hazard ratio for all-cause mortality in Cox proportional hazards model.

Table 2			
	HR	95% CI	P-value
DAGL	0.93	(0.86, 1.02)	0.1287
Age (45-64 vs 18-44)	1.54	(1.46, 1.62)	<0.0001
Age (65-74 vs 18-44)	2.18	(2.07, 2.30)	<0.0001
Age (>= 75 vs 18-44)	2.89	(2.74, 3.05)	<0.0001
Male vs female	1.2	(1.18, 1.23)	<0.0001
Serum Albumin [g/dL]	0.44	(0.43, 0.45)	<0.0001
Serum Creatinine [mg/dL]	1	(1.00, 1.00)	0.0126
Ferritin [ng/mL]	0.74	(0.73, 075)	<0.0001
Hgb [g/dL]	0.92	(0.91, 0.92)	<0.0001
Serum phosphate [mg/dL]	1.05	(1.04, 1.06)	<0.0001
MLR	1.02	(1.01, 1.02)	<0.0001

DAGL = Dialysis after Graft Loss. Hgb = Haemoglobin. MLR = Monocyte-to-lymphocyte ratio

Discussion: DAGL patients appeared to have an increased mortality compared to T-N dialysis starters historically in the literature. Our large and recent study is in line with other recent publications suggesting a more equivalent survival in the two groups. Our results are compatible with younger patients receiving kidney transplantation early in their renal replacement therapy journey, thus constituting a significant proportion of DAGL patients. We posit that DAGL patients may start dialysis at a lower level of renal function, with higher levels of inflammation. Our analysis is preliminary and limited, not fully accounting for confounding factors. Future analysis of this large and well recorded dataset will allow us to more closely examine these interesting associations and design a more specialised management approach to DAGL.

Poster number: 101

Submission number: 599

Calcium mass balance in adults during haemodialysis and haemodiafiltration treatments

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UCL, London

Dr Roohi Chhabra

Biography
Renal SpR at Royal Free Hospital

Abstract

Introduction: Calcium is an essential cation, which plays a key physiological role in the body, ranging from nerve and muscle function, to numerous intra and extracellular enzyme-mediated processes, including regulation of the clotting cascade, and providing skeletal rigidity by being an essential component of mineralised bone. As such, calcium is highly regulated to maintain homeostasis by numerous hormones which modulate calcium transport in the gut, kidneys, and bone, including parathyroid hormone (PTH), 1,25-dihydroxyvitamin D3 (calcitriol), fibroblast growth factor 23, calcitonin and oestrogen.

As patients develop progressive chronic kidney disease (CKD), the ability to excrete calcium in the urine declines, and is lost in the anuric patient. Consequently, haemodialysis (HD) patients are at increased risk of mineral and bone disorders (MBD), resulting in significantly greater morbidity and mortality. Thus, for the dialysis patients the calcium balance is the result of net calcium absorption from the gastrointestinal tract, calcium excretion in residual urine output, which may be zero, calcium losses with perspiration from the skin, and the net calcium transfer during each dialysis session.

Debate continues as to the optimum haemodialysis (HD) dialysate calcium concentration. Although over time dialysate calcium concentrations have reduced, with current guidelines advocating 1.25-1.5 mmol/L, some investigators have criticised even the lower target as potentially resulting in chronic calcium loading. As such we decided to measure dialysis calcium balance.

Methods: We developed a method to continuously collect an aliquot of effluent dialysate during dialysis sessions, and calculated dialysis calcium mass balance by the difference between the amount of calcium delivered as fresh dialysate and that in effluent dialysate.

Results: Effluent dialysate was collected from 106 stable outpatients, 64% male, mean age 64.4±16.2 years, median dialysis vintage 32 (22-60 interquartile range) months. Most patients (69%) used a 1.0 mmol/L calcium dialysate, with a median sessional loss of 13.7 (11.5-17.1) mmol, whereas those using 1.25 mmol/L had a median loss of 7.4 (4.9-10.1) mmol, although 6.9% had a positive balance (X2 4.7, p=0.031). The majority of patients (85.8%) were treated by haemodiafiltration, but there was no

difference in sessional losses (11.7 (8.4-15.8) vs 13.5 (8.1-16.8) with high flux HD). Dialysis sessional calcium balance was associated with the use of lower dialysate calcium concentration (β -19.5, 95% confidence limits (95%CL) -27.7 to -11.3, p<0.001, and sessional duration (β 0.07(95% CL) 0.03-012, p=0.002).

Conclusion: Ideally the choice of dialysate calcium should be individualised, to take into account dietary habits, skeletal strength and health and concomitant medications. Our study would favour the use of lower dialysate calcium concentrations to ensure an overall negative balance.

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Poster number: 102

Submission number: 280

A retrospective single centre review of percutaneous versus surgical peritoneal dialysis catheter insertion.

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[1]renal Department, Tallaght University Hospital. [2]urology Department, Tallaght University Hospital

Dr. Sorcha O'brien

Biography

Dr. O'brien Is A Renal Spr, Currently In Her Second Year Of Higher Specialty Training In Ireland. She Is Especially Interested In Peritoneal Dialysis And Dialysis Access.

Abstract

Introduction: The timing of successful peritoneal dialysis catheter (PDC) insertion is key to running a peritoneal dialysis (PD) program. Previous retrospective studies have shown percutaneous catheter insertion is a safe insertion technique with similar catheter survival rates. The benefits of percutaneous PDC insertion include avoidance of general anaesthesia, it is less invasive and associated with faster recovery. Additionally, percutaneous PDCs are inserted by the nephrology team so there is more control over timing of insertion. Our aim was to compare the success of peritoneal dialysis catheter insertion through percutaneous vs surgical techniques.

Methods: We conducted a retrospective review of the outcomes of PDC insertion comparing percutaneous and surgical techniques in a single centre between January 2013 and December 2022. We reviewed the charts of all patients who had a PDC inserted during this time. 236 patients were included. Data was analysed using R.

Results: 114 (48.3%) catheters were inserted surgically, 122 (51.7%) were inserted percutaneously. Surgical insertion was carried out under general anaesthesia, the majority using an open technique with 7.9% inserted laparoscopically. Percutaneous PDC insertion was performed by a consultant nephrologist.There was a significantly higher rate of previous abdominal surgery in the surgical group (61% vs 11%, p <0.001) compared to the percutaneous group. There was a significantly higher rate of Polycystic Kidney Disease (PKD) as cause of end stage kidney disease in the surgical group vs the percutaneous group (13% vs 1.6%, p< 0.001). There was no significant difference in catheter survival between the surgical and percutaneous groups. The mean catheter survival rate in the surgical group was 19.8 months compared to 24.1 months in the percutaneous group. There were similar complications rate between both groups.

Kaplan-Meier Survival Curve
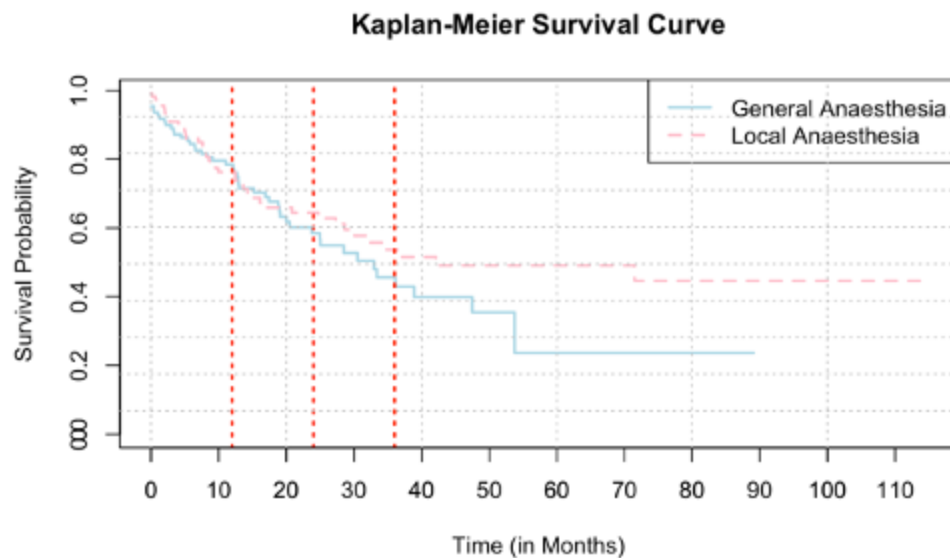
Reasons for Transfer to HD

Reasons for transfer to HD	Surgical [n(%)]	Percutaneous [n(%)]
	45	40
Catheter related indications		
Leakage	3 (6.67)	6 (15)
Blockage	7 (15.6)	2 (5)
Primary failure	1 (2.2)	0 (0)
Non-catheter related indications		
Infection	7 (15.6)	7 (17.5)
Compliance	4 (8.9)	2 (5)
Poor exchanges/UF failure	19 (42.2)	17 (42.5)
Abdominal surgery	1 (2.2)	0 (0)
Unknown	3 (6.67)	6 (15)

Complications

Complications	Surgical (n)	Percutaneous (n)
Bladder injury	1	1
Primary failure	1	1
Hernia	1	2
Scrotal Leak	1	2
Pleural Leak	2	4
Peritonitis	7	7
Secondary drainage failure	10	4

Discussion: Percutaneous PDC insertion is a safe alternative technique in a select cohort of patients. Patients selected for surgical insertion had more comorbidities and previous abdominal surgeries. Catheter survival is similar irrespective of mode of insertion. The rate of complications is low in both techniques. We are collecting further information on this group comparing reasons for catheter failure.

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Risk of PD peritonitis and outcomes for immunosuppressed patients on peritoneal dialysis: a single centre review.

Dr Mohammed Lawal, Dr Jennifer Allen

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Dr Mohammed Lawal

Biography
Mohammed is a third year Internal Medicine Training with interest in Renal Medicine. He broadly has an interest in Renal Replacement Therapies and improving quality of life for patients with ESRD. In the long term, he aims to improve access and affordability of Renal Replacement Therapy for patients in developing countries especially his home country Nigeria

Abstract

INTRODUCTION: Peritonitis is a serious complication of peritoneal dialysis (PD) leading to PD catheter loss, unplanned transfer to hemodialysis (HD) and increased mortality. Many renal patients require immunosuppression, and this may be considered a barrier for patients when considering PD as a renal replacement therapy choice.

METHOD: We carried out an observational study of incident PD patients over 5 years.
We identified patients on Immunosuppressants while on PD, and the reason for immunosuppression. We recorded episodes of peritonitis in IS and non-IS patients including recurrent and repeat (multiple) episodes. We evaluated the treatment outcomes at the end of the study period in all groups.

RESULTS: 220 patients started PD from 2017 to 2021. 16 were on immunosuppressants. Indications for immunosuppression were failed transplant (25%), vasculitis (25%), adrenal Insufficiency (12.5%). Other indications (membranous nephropathy, SLE, hematological disease, malignancy, bullous pemphigoid and psoriasis) accounted for 1 (6.25%) case each.

Six (37%) immunosuppressed patients developed peritonitis, with four (67%) having two or more episodes. For the 2 (33%) immunosuppressed patients with 1 episode of peritonitis, the organisms responsible were Pseudomonas aeruginosa and Escherichia coli

In those with multiple episodes, organisms identified were Staphylococcus epidermidis, Staphylococcus aureus, Viridans streptococci, Klebsiella pneumoniae, Corynebacterium species and Cryptococcus neoformans.

In the non-immunosuppressed patients, 95 (46%) developed peritonitis, with 47 (50%) having multiple episodes. Immunosuppressed patients with peritonitis were more likely to transfer to

HD during the study period (50% IS patients vs 35% non-IS patients) and transfer to HD was more common in all patients with peritonitis.

Table 1 Outcomes according to immunosuppression (IS) and peritonitis status

Outcomes	IS + peritonitis (n=6)	IS without peritonitis (n=10)	No IS + peritonitis (n=95)	No IS without peritonitis (n=109)
Continued PD	1 (17%)	5 (50%)	19 (20%)	28 (25%)
Transfer to HD	3 (50%)	1 (10%)	33 (35%)	21 (19%)
Transplanted	-	2 (20%)	18 (19%)	32 (29%)
Died	2 (33%)	3 (30%)	22 (23%)	24 (22%)
Other	-	-	3 (3%)	4 (4%)

DISCUSSION : In this single centre cohort, PD patients on immunosuppressants did not have more episodes of peritonitis but were more likely to develop multiple episodes. In both groups patients with peritonitis were more likely to transfer to HD, and less likely to be transplanted. Our study supports existing data showing that peritonitis is a major cause of technique failure and mortality but does not suggest that this risk is increased by immunosuppression. Our data supports the view that immunosuppressed patients should be offered PD as a RRT treatment choice.

Poster number: 104

Submission number: 339

Ten years of Home Haemodialysis at the Wessex Kidney Centre: access and outcomes

Dr Ahmed Elsolia, Dr Nazarin Saidalavi, Dr Abdulhamid Kanaan, Dr Venkat Gangaram, Dr Natalie Borman, Dr Nicholas Sangala

Wessex Kidney Centre, Portsmouth

Dr Nicholas Sangala

Biography
Consultant Nephrologist with diverse interest in Home HD, Vasculitis, Vascular Access, and research interest in the cardiovascular effects of dialysis. Co-Founder at MyRenalCare and NHS Clinical Entrepreneur

Abstract

Introduction: Home haemodialysis (Home HD) provides individuals with End Stage Renal Disease (ESRD) better survival and quality of life compared to other dialysis modalities (1,2). The Wessex Kidney Centre has a large home HD program started in 2009. Here we describe our home HD population, vascular access at initiation, and outcomes following Home HD over the previous decade.

Method: We conducted a retrospective study looking at individuals successfully starting home HD between Jan 2010 and January 2020 at the Wessex Kidney Centre. We report Charlson Comorbidity index (CCI) and access type at the start of Home HD (3). Outcomes are reported from the moment an individual left the program or their status as of January 1st, 2023.

Results: Between 2010 and 2020, 272 individuals with ESRD started on Home HD with an average age of 53yrs and a CCI score of 4.5. Dialysis access was varied with 36.6% starting on a tunnelled dialysis catheter (THL) and 63.4% with an AVF/AVG. There was little difference between age and CCI between these groups (Table 1).

Table 1

Access at start	Number (%)	CCI average (StD)	Average of Age at initiation in years (StD)
AVF	156 (57.5)	4.3 (1.9)	52.1 (13.8)
AVG	16 (5.9)	4.3 (2.7)	47.4 (15.6)
THL	100 (36.6)	4.9 (2)	55.4 (13.4)
Grand Total	272	**4.5 (2)**	**53.1 (13.9)**

AVF: arteriovenous fistula, AVG: arteriovenous graft, THL: Tunnelled Haemodialysis Line, StD: Standard Deviation, CCI: Charlson Comorbidity Index

On average individuals remained on Home HD for more than two years with the longest patient being on therapy for 12.7 years before receiving a renal transplant. The average age of our patients was 53yrs (17-88) with an average CCI of 4.5 (2-11). 37% came off the program following a renal transplant, whilst 24% switched to in centre HD, and 23% sadly died. Individuals who received a renal transplant were younger and had a lower CCI than others (table 2)

Table 2

Outcome	Number (%)	CCI average (Std)	Average age at the start (std)	Length on HHD in Months (std)
Death	63 (23.2)	5.6 (2.1)	57.5 (13.1)	30.3 (23.6)
HHD	37 (13.6)	4.6 (2.3)	52.9 (15.1)	48.3 (26.3)
In-centre HD	66 (24.3)	4.6 (1.9)	55.2 (13.9)	16.5 (18.8)
Moved out of area	3 (1.1)	2.7 (0.6)	48.7 (2.5)	18.0 (10.1)
Transplant	103 (37.9)	3.8 (1.6)	49.1 (13.1)	24.1 (22.2)
Total	272	4.5 (2)	53.1 (13.9)	26.9 (24.2)

Discussion: This data shows Home HD is an option for individuals across a wide age range and in individuals with a significant co-morbid burden. Whilst access on Home HD is a grey area, our data shows that Home HD can be successfully delivered using all access types.

This is a retrospective descriptive study therefore we acknowledge our data should be utilized with caution.

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Poster number: 105

Submission number: 402

Risk factors, Treatment and Outcomes in Pseudomonas Peritoneal Dialysis (PD) Peritonitis; 6-year single centre experience

Dr JHOOMAR MAKHIJA[1], Dr LOIS HAWKINS[2], Dr BHRIGU SOOD[1], Dr JAYAKEERTHI RANGAIAH[2]

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[2]DEPARTMENT OF MICROBIOLOGY, EPSOM AND ST HELIER UNIVERSITY HOSPITALS NHS TRUST

Dr JHOOMAR MAKHIJA

Biography
Im a Nephrologist currently working as a Locum Consultant at St Helier Hospital in London. My main focus is improving vascular access for dialysis patients, and I love working with different teams to enhance outcomes for people with kidney disease.I began my medical journey with an MBBS from K.J. Somaiyya Hospital in Mumbai, India(2003-2009).Further on,I did my postgraduate studies in Internal Medicine and specialized in Nephrology,in Mumbai.Seeking further expertise, I completed a fellowship in Interventional Nephrology at Albany Medical Centre in New York, USA.In 2022, I moved to the UK and worked as a registrar at Royal Free Hospital and St Helier Hospital, where I gained Nephrology qualifications (ESENeph). For the past four months as a Locum Consultant Nephrologist in London, I've been actively involved in caring for pre-dialysis, dialysis, and general nephrology patients. My clinical experience guides my research, which focuses on addressing the needs of pre-dialysis and CKD patients. I specialize in interventional procedures like creating vascular access for dialysis. I'm honored to be a fellow of the American Society of Nephrology and a member of ASN and ASDIN. My dedication to patient care and advancing nephrological practices drives my passion in the field.

Abstract

Introduction: Pseudomonas peritonitis is a serious complication of peritoneal dialysis and associated with poor cure rates. According to ISPD guidelines, the use of mupirocin is recommended for preventing exit site infections in peritoneal dialysis. However, it's essential to note that mupirocin specifically targets gram-positive bacteria, potentially leaving gram-negative bacteria unaffected.

Methods :We retrospectively analysed a 6 year data (2016 – 2021) to determine the incidence, risk factors, treatment and outcomes for patients with confirmed Pseudomonas peritonitis in our centre. The primary objective to assess the susceptibility of microorganisms to empirical antibiotics and ascertain their continued appropriateness as a treatment choice.

Results: We identified 38 patients with Pseudomonas peritonitis over the period of 6 years. The cohort comprised individuals with comorbidities, including diabetes (n=9) and prior immunosuppression (n=5), with a mean age of 66.9 years.

5 (13.2%) patients had a history of previous peritonitis, and 9 (23.7%) exhibited prior exit site infections (ESI). The average duration between PD initiation and Pseudomonas peritonitis onset was 15.84 months while 14 (35.9%) developed the infection within 6 months of initiating PD.

36 patients required admission for management of peritonitis. Concomitant exit site infection was noted in 14 cases (36.8%), with 5 patients presenting with tunnel infections (13.2%). Outcomes included 23 patients transferred to haemodialysis (60.5%),8 patients remained on PD (21%), 3 deaths (7.9%), and 2 cases of relapse (5.3%). Urgent catheter removal was necessary in 20 cases (52.6%), while 18 underwent planned catheter removal (47.4%). Peritoneal lavage was performed in 8 cases (21.1%).

Pseudomonas accounted for 16% (38/234) of all culture-positive peritonitis cases in our unit, characterized by PD fluids with a white cell count exceeding 100/µl. Ps.(Pseudomonas) aeruginosa was the most prevalent species (32, 84%), followed by Ps. putida (2, 5%), Ps. species (2, 5%), Ps. stutzeri (1, 3%), and Ps. luteola (1, 3%). Two out of 38 cases exhibited resistance to gentamicin. Patients responded well to intraperitoneal gentamicin and oral ciprofloxacin, while 11 out of 38 cases (28.9%) necessitated intravenous antibiotics (tazocin/ceftazidime/meropenem) in complicated scenarios.

Discussion: Pseudomonas has emerged as a frequent cause of Gram-negative peritonitis, often associated with elevated rates of catheter removal and a permanent shift to hemodialysis. Early recognition and effective management are crucial for enhancing patient outcomes in cases of Pseudomonas peritonitis during peritoneal dialysis. Our findings indicate that a significant portion of patients had prior exit site infections, and a substantial percentage had concurrent exit site and tunnel infections, underscoring the need for preventive strategies to address these issues and reduce the overall incidence of peritonitis. Considering potential practice changes, the introduction of biopatch in addition to mupirocin warrants evaluation to assess its impact on reducing the incidence of exit site/tunnel infections, thereby further lowering peritonitis rates in PD patients. Moreover, exploring the inclusion of 3rd generation cephalosporins in empirical treatment against Pseudomonas, in addition to vancomycin and gentamicin, could be crucial.

Does biological sex play a role in peritoneal dialysis exit site infection?

Dr Hannah Beckwith, Lourelei Cepe, Sally Punzalan, Dr Gaetano Lucisano, Dr Richard Corbett, Professor Edwina Brown

Imperial College Healthcare NHS Trust, London

Dr Hannah Beckwith

Biography
Dr Hannah Beckwith is a Specialist Registrar (SpR/Fellow) on the North London Training Programme (United Kingdom). She has recently completed her PhD at the MRC Laboratory of of Medical Sciences looking at the role of SGLT3 during pregnancy and lactation. Hannah's research interests include

Abstract

Background: Peritoneal dialysis (PD)-related infections have been ranked as the most critically important clinical outcomes in PD by patients, carer and clinicians in the Standardised Outcomes in Nephrology- PD (SONG-PD) initiative[1].

Identifying risk factors that pre-dispose people on PD to develop exit site infections (ESI) may help improve prevention and treatment[2].

Given the differences anatomically, hormonally and of the microbiota profile between males and females, we hypothesised that there is a difference in ESI incidence, outcomes, and organism-specific ESI between the sexes.

Methods: This was retrospective case note review of all PD patients at our centre between 01/01/2012-01/01/2024: ethical approval was therefore not required.

All patients were trained in standard exit-site (ES) care, using mupirocin at the time of ES dressings. Clinical, biochemical, and microbiological records were reviewed and details of all positive ES swabs recorded. As such, culture negative ESI were excluded in this study.

Data were transcribed from patient medical records and included age, sex, organism intervention/treatment(s) and clinical outcomes. A clinically relevant diagnosis of ESI was made when treatment was initiated for purulent discharge at the catheter ES. Sex of the patient was doctor-determined and confirmed with case records.

Results :

<u>Demographics</u>

During the 12-year study period, 202/486 patients on PD were female (42%). 404 positive swabs from 176 patients (82F, 94M) were identified (0.27 patient episodes/year), within the recommended rate <0.4 episodes/year, ISPD 2023[2].

We were unable to locate data for a 5-month period 2018-2019 when records transitioned from paper to electronic recording.

We found no statistically significant difference in the incidence of ESI between sexes in our cohort (p=0.15, Table 1a).

Table 1
a. Microbiology of ESI

Organism Classification	Male, N (%)	Female, N (%)	P Value
Gram-positive bacteria	114 (48)	75 (45)	0.69[a]
Gram-negative bacteria	90 (38)	61 (37)	0.92[a]
Fungal	9 (3.8)	14 (8.5)	***0.05[a]**
Anaerobes	16 (6.7)	8 (4.8)	0.52[a]
Mixed organisms	10 (4.2)	7 (4.2)	1.00[a]
Total overall	**239 (59)**	**165 (41)**	**0.15[b]**

b. Clinically relevant ESI

Organism Classification	Male, N (% of total swabs)	Female, N (% of total swabs)	P Value
Gram-positive bacteria	74 (47)	51 (46)	0.90[a]
Gram-negative bacteria	67 (42)	47 (42)	1.00[a]
Fungal	7 (4.4)	6 (5.4)	0.78 [a]
Anaerobes	8 (5.1)	4 (3.6)	0.77[a]
Mixed organisms	2 (1.3)	4 (3.6)	0.24[a]
Total	**158 (59)**	**112 (41)**	**0.15[b]**

A Fishers exact test
B Two-way ANOVA

<u>Microbiology:</u> Females were more likely to grow yeasts on ES swab (P=0.05, Table 1a). Males were twice as likely to grow anaerobes, although this was not statistically significant. Sex had no influence on the likelihood of gram-positive or gram-negative infection (Figure 1a).

a. All positive exit-site swabs
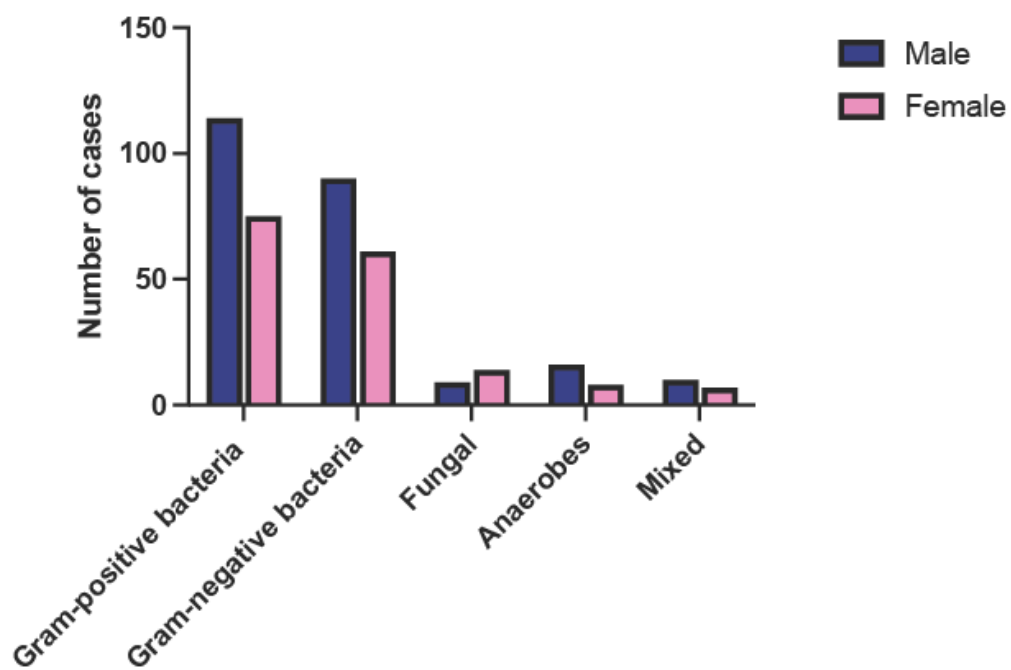
b. Clinically relevant ESI
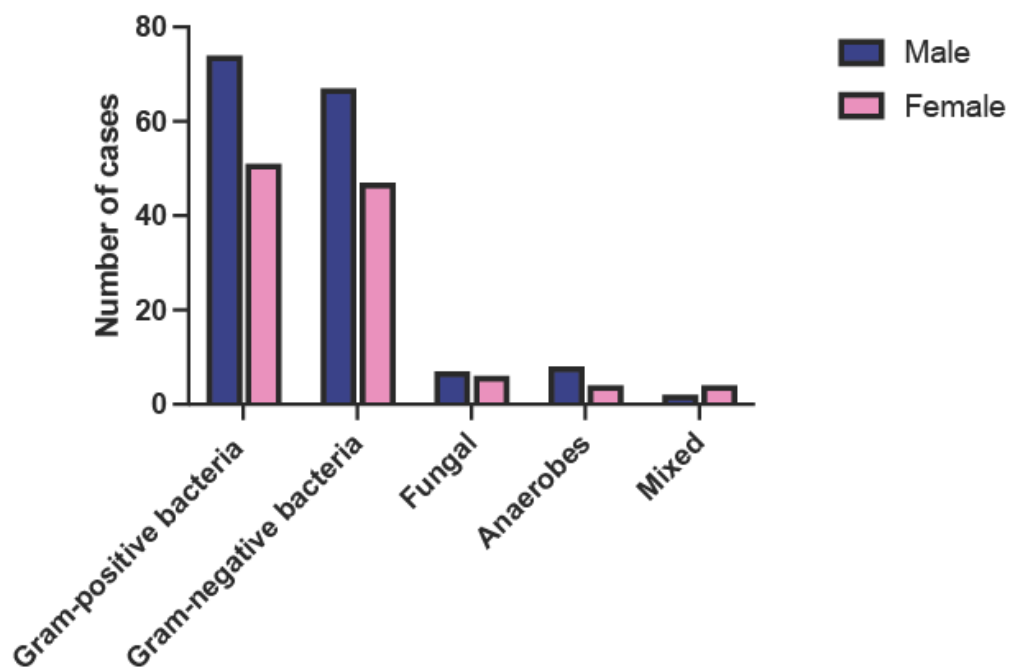
Clinical diagnosis of ESI

270 diagnoses of clinically relevant ESI were made (Table1b, Figure 1b). Again, twice as many positive ES swabs for anaerobes came from male patients, but this did not reach statistical significance. There was no difference in the incidence of clinically relevant ESI between sexes (P=0.15). Figure 2 shows the differential composition of ESI by microorganism and sex.

Male

- Gram-positive bacteria
- Gram-negative bacteria
- Fungal
- Anaerobes
- Mixed

Total=158

Female

- Gram-positive bacteria
- Gram-negative bacteria
- Fungal
- Anaerobes
- Mixed

Total=112
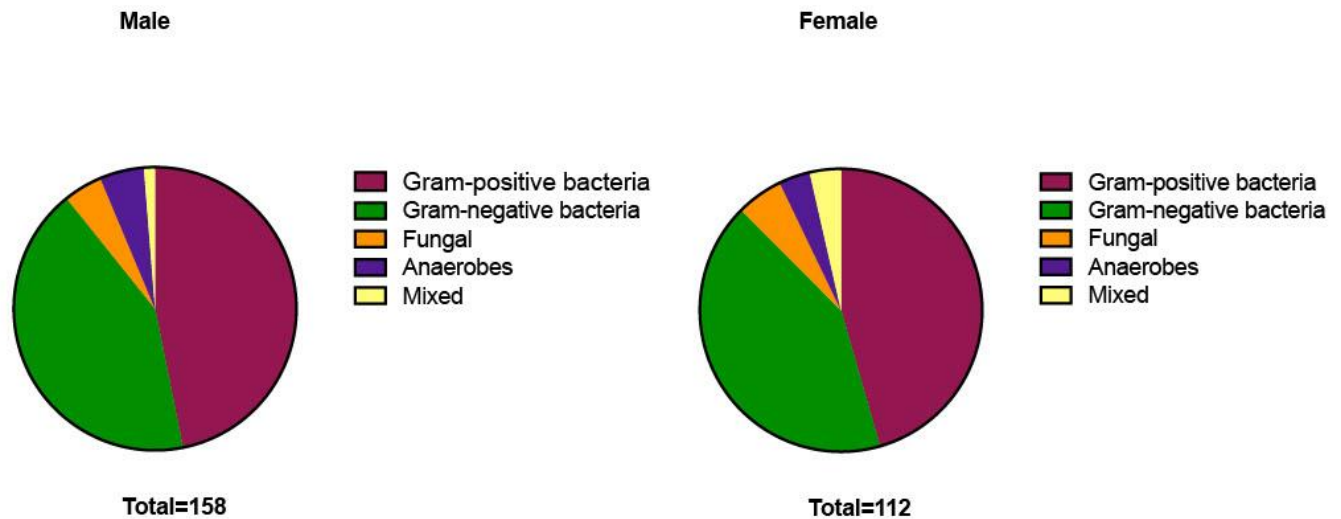
Clinical Outcomes

14% of people with ESI developed peritonitis (14F, 25M) and 15% required catheter removal (18F, 22M). There was no difference in peritonitis incidence (P=0.49) nor catheter removal (P= 0.86) between the sexes.

Discussion: This is one of the largest series of ESI reported. We found significant morbidity from ESI but that sex has no influence on ESI incidence, epidemiology of infection or outcome.

Interestingly, females were more likely to grow yeasts on ES swab, yet more males were treated for fungal infection. This may represent higher levels of colonisation in females (although we had to assume that ESI swabs were sent in the presence of purulent infection.)

Given the small number of patients included despite a 12-year follow up period, larger studies to explore subtle sex differences are needed.

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Poster number: 107

Submission number: 409

Examining the impact of using u-drain in the peritoneal dialysis pathway on the triple bottom line.

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Mrs Joanne Martin

Biography
Advanced Nurse Practitioner in Renal services at Salford Royal Hospital, Northern Care Alliance.

Abstract

Introduction

Chronic kidney disease is increasingly recognised as a global health problem, and it is also known that climate change can have impact on the prevalence of chronic kidney disease. As a double edge impact, whilst climate change is itself increasing the prevalence of CKD then caring for patients with kidney disease then involves substantial resource use and greenhouse gas emissions. (Yau et al, 2021).

The aim of this project was to undertake a thorough evaluation to understand the environmental impacts of the peritoneal dialysis pathway within our patient population, considering the alternative option of traditional drain bags by using the u-drain innovation. Automated peritoneal dialysis (APD) typically produces 10-15 litres of effluent waste fluid into drain bags, the u-drain is a fixed drainage system which connects the dialysis effluent outflow directly to the household drainage system. Whilst calculating the carbon emissions for both systems we also examined the impact of this on the triple bottom line.

Methods

Process mapping was undertaken for established patients on automated peritoneal dialysis. Following this, the carbon foot printing of this process was undertaken using both the u-drain and traditional drain bags.

As a unit we take an individualized approach to therapy considering factors such as residual renal function, fluid balance, lifestyle, and frailty so an average was assumed that is reflective of the current population. We have assumed 6 sessions per week of APD with 8 hours per session, using 12 litres of dialysis fluid. Also included are 15 home visits per year from the nursing team and a routine 3 monthly outpatient attendance. Routine blood tests were added in, alongside an average calculation of medication.

Results

Economic sustainability

APD waste bags cost approximately £2.40 each, amounting to approximately £1600 per year as common practice is to use 2 bags per session. U-Drain cost for installation including materials is £350 and for maintenance £500 per year.

Social sustainability

There are many documented benefits around home therapies, often associated with greater patient autonomy and treatment satisfaction (Perl et al., 2023). The use of u-drain could potentially make APD an option for more patients.

The PD patient population is known to have a higher prevalence of frailty regardless of age, it has been reported as affecting two-thirds of these patients (Pereira et al., 2021). Given the compromised physical performance associated with frailty, the lifting and disposing of the effluent and APD waste bags is a repetitive and laborious task. From a social perspective this could enable patients to have a home therapy when this may not have been available.

Environmental sustainability

67% of the total footprint comes from dialysis fluid with the remaining contributions coming from a combination of all the other items, with no other single item demonstrating a significant impact.

The calculations were also run to identify if any there was a difference in the use of drain bags and the u-drain system.

The results are below.

	KgCO2e per session	KgCO2e annually
With U-Drain	22.25	6941
With Drain bags	24.78	7732

The calculations demonstrated that using u-drain rather than traditional drain bags saved 791 kgCO2e annually per patient.

Discussion

This exercise has highlighted the considerable carbon emissions associated with peritoneal dialysis, whilst also demonstrating that the u-drain system offers improvement across the triple bottom line with social, economic and financial impact.

References (if any)

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Poster number: 108

Submission number: 501

Optimising the PD pathway: A collaborative approach to extend PD duration and minimise premature Haemodialysis transfers for enhanced clinical outcomes

Mrs Jo Williams[1], Geraldine McCann[2], Laura Willisson[2]

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Mrs Jo Williams

Biography
Renal Nurse of >30 years. Working both in roles in NHS and Industry, across all renal disciplines but predominantly in PD, Education and Management. Currently Senior Renal Therapy Specialist for Baxter Healthcare in the London and the South East working in collaboration with NHS Renal units to improve the patient experience and outcomes using quality improvement processes.

Abstract

Introduction: In the realm of End-Stage Kidney Disease (ESKD) therapies, peritoneal dialysis (PD) stands as a pivotal modality offering numerous benefits, including an enhanced quality of life for patients. The St Helier Dialysis Unit houses a PD program accommodating 120 patients. However, a significant challenge arose, with many transitioning to haemodialysis (HD), particularly within the critical initial 90 days of PD initiation. Recognising the need for investigation and improvement, a collaborative effort was launched with Baxter Renal Therapy Specialist (RTS) and the St Helier PD Team.

Background: The transition from PD to HD within the first 90 days presents a multifaceted challenge with profound implications for patient well-being and healthcare resources. A thorough review of patient data uncovered the necessity for substantial enhancements in patient experience and outcomes. Consequently, a collaborative agreement was formed with Baxter RTS and the St Helier PD Team to scrutinise the PD pathway, aiming to identify and rectify variations and inefficiencies.

Method: A comprehensive review of the patient pathway was undertaken to pinpoint areas of unwarranted variation in management and patient experience. Key focus areas, spanning patient education to post-initiation support, were identified. This paved the way for a Quality Improvement project designed to standardise practices, ensuring a consistent and optimised approach to PD therapy while preventing premature transitions to HD.

The collaboration involved a multidisciplinary team, including nephrologists, nurses, and RTS. Regular meetings streamlined communication, fostering a collective understanding of challenges and opportunities within the PD pathway. The establishment of standardised protocols and identification of key performance indicators were integral components of this initiative.

Results: The collaborative effort yielded multifaceted results. Preliminary data suggests a reduction in patients transitioning to HD within the first 90 days of commencing PD. A quantitative analysis of the number of patients transferring to HD and corresponding days on PD is underway, offering insights into the intervention's effectiveness.
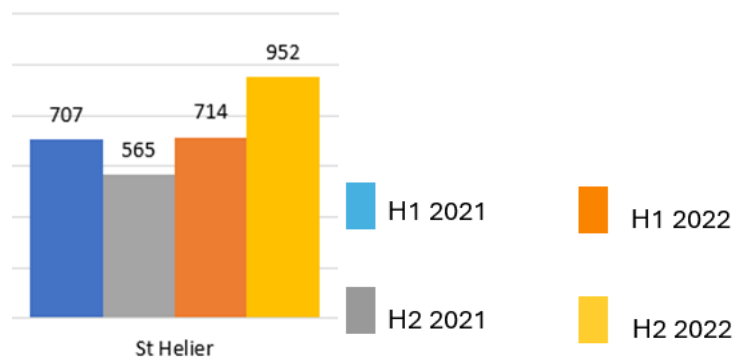
Fig. 1 *Number of days on PD from 2021 to 2022*
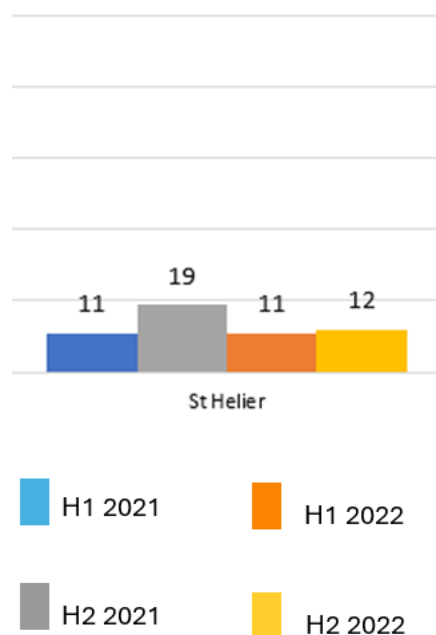
Fig. 2 N*umber of patients transferring to HD during the period of 2021 to 2022.*
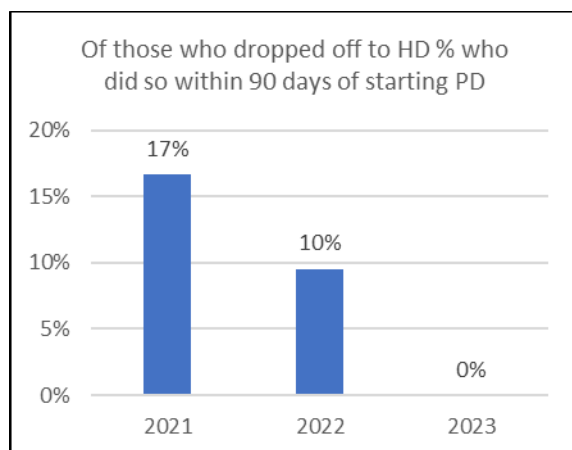
Fig. 3 & 4. Percentage of those who dropped off to HD within 90 days of starting PD
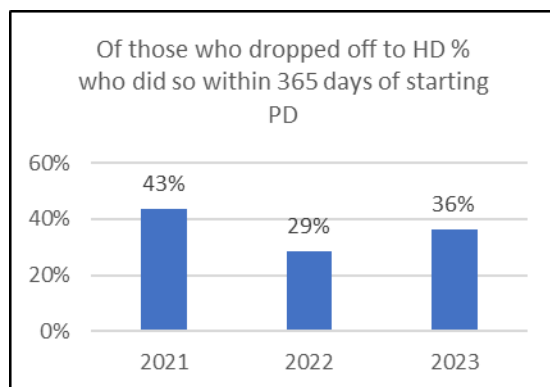
Fig. 4 &5 *Percentage of patients who dropped off to HD within 365 days of initiating PD therapy.*

Furthermore, assessments derived from patient feedback and satisfaction surveys reveal an enhancement in the perceived quality of care and comprehension of the PD. These findings imply a favourable influence on patient engagement and adherence to the therapeutic regimen.

Discussion: The collaborative approach to optimising the PD pathway has demonstrated encouraging results. Addressing variations and implementing evidence-based standardised practices anticipates a significant extension of the duration patients remain on PD. This aligns with the goal of enhancing clinical outcomes and efficiently utilising healthcare resources by reducing premature transitions to HD. The multidisciplinary collaboration exemplifies the benefits of partnerships between healthcare providers and industry experts, driving meaningful change in patient care delivery.

This work encapsulates the ongoing initiative's comprehensive approach, laying the foundation for improved clinical outcomes, enhanced patient satisfaction, and reduced premature transfers to HD. The collaborative efforts underscore the commitment to advancing renal care through innovative solutions and multidisciplinary partnerships.

Improving rates of PD peritonitis: impact of the Midlands Renal Network regional subgroup on PD peritonitis at a single centre, a two year review

Dr Jennifer Allen, Rachel Humphreys, Ginette Brewster, Shani Melbourne

Nottingham University Hospitals NHS Trust, Nottingham

Dr Jennifer Allen

Biography
Consultant nephrologist and PD lead at Nottingham University Hospitals NHS Trust, with an interest in PD and pregnancy in renal disease, and a research background in AKI and transplant biomarkers.

Abstract

Introduction

Peritoneal dialysis (PD) peritonitis rates are high in the UK, and particularly the Midlands. As part of the Midlands Renal Network a regional subgroup was established to focus on improving rates of PD peritonitis. This group set a target to achieve an average peritonitis infection rate of <0.35 and no unit to have a rate of above 0.40 in the East and West Midlands by October 2024. As part of this quality improvement process, our unit developed two quality improvement projects which have now run for 2 years.

Methods

Project 1 was to develop proactive technique refresher training for all patients on PD. We identified named nurses to take on refresher training, all prevalent PD patients were invited to sessions run on a monthly basis. We aimed to offer all patients refresher training within 6 months of starting PD.

Project 2 was to develop a continuous quality improvement project by revamping our peritonitis review meetings. The aim was to improve treatment of peritonitis and identify themes for quality improvement. We used the format of existing peritonitis review meetings but increased their frequency from yearly to quarterly. Root cause analyses (RCAs) were performed for every episode of peritonitis and a rolling peritonitis action plan was put in place. We added in weekly real time reviews of all current cases of PD peritonitis or exit site infection.

Both projects were delivered by multidisciplinary teams and were delivered using PDSA reviews. In 2023 the teams were supported with QI methodology training provided by KQuIP.

Results

Project 1 started in January 2022. All prevalent PD patients on PD for greater than 6 months were invited to attend a refresher session. The PDSA review identified low uptake, leading to a change in the method of inviting patients to attend from informal phone call to an appointment with a letter of invitation.

Project 2 also started in January 2022. We integrated a weekly review of all peritonitis cases into standard practice. We undertook quarterly review meetings which led to realistic action plans being put into place.

At the end of year 2 our quality improvement projects were embedded into practice, however our peritonitis rates remained above our regional target at 0.62 cases per patient year.

Discussion

Peritonitis rates in our unit remain above ISPD targets and the target set by our regional subgroup. However, with the introduction of our quality improvement project we have made meaningful changes to our practice. Our projects need ongoing development, to increase patient engagement and uptake of refresher sessions, and to allow themes and actions from RCA meetings to be put in place.

Utility of a dependency tool in determining workload allocation and interventions in patients receiving peritoneal dialysis- A single centre observational study

Professor HELEN HURST[1,2], Dr Joshua Pink[1], Dr David Lewis[2], Dr Rajkumar Chinnadurai[2], Dr Dimitrios Poulikakos[2], Joanne Collier[2], Joanne Martin[2], Dr Lesley Lappin[1], Professor Paula Ormandy[1]

[1]University of Salford, Salford. [2]Northern Care Alliance NHS Foundation Trust, Salford

Professor HELEN HURST

Biography
Helen is a Professor of Nursing and holds a joint clinical academic position with the University of Salford and the Northern Care Alliance NHS Trust. She has over 30 years' experience working in the NHS in renal medicine and care of the elderly, with over 20 years in advanced practice. She holds national and international leadership positions, Secretary of Association of Nephrology Nurse UK, Co-chair UK Innovation and Dialysis Network, Education and Workforce Lead for the Northwest Kidney Network. Her research area is older people, frailty and advanced kidney disease, including a specialist interest in peritoneal dialysis.

Abstract

Introduction

Peritoneal dialysis at home offers advantages to enable people to manage their own treatment whilst promoting self-care. The provision of support by the health care team includes monitoring, assessments, education and psychosocial support. Standards and recommendations that nursing teams follow on the regularity and need for home visits lack clear evidence that relate directly to outcomes. Allocated staff ratios per numbers of home patients have been used to create teams but there is variability across the UK. To overcome the lack of clear guidelines one centre in the Northwest introduced a dependency tool to score patients according to their dependency and then allocate interventions and workloads accordingly. To date no analysis has taken place on the predictability, reliability, inter-relatability or impact on outcomes.

Methods

A retrospective analysis of 50,595 dialysis patient assessments from 920 unique patients between 2012 to 2021 was conducted. The average age of patients at assessment was 62.7 years, with 45.0% of the patients coming from 2 most deprived IMD deciles. At each assessment, patients were categorised into one of 5 severity categories based on their level of need for support, with each category defining the length of time until a further visit was expected to be needed.

Results

Results of the following analyses are available:

- Changes in assessment scores over time for individual patients.
- Inter-rater reliability of assessments (where two separate assessments were conducted for an individual on the same day).
- Link between assessments and process outcomes (for example, the relationship between severity category and the length of the visit and treatments provided).
- Link between assessments and clinical outcomes – (for example, the relationship between severity category and risk of infection or risk of death).

Example results are presented in the attached tables, showing:

- The probability of dying within 180 days of an assessment, which increases from 5.4% in the lowest risk category to 29.4% in the highest risk category (Table 1)
- The probability of peritonitis or exit site infection at the next visit, which increases from 2.8% in the lowest risk category to 9% in the highest risk category. (Table 2)
- The length of staff visits, with only 1% of visits for people in the lowest risk category lasting over 120 minutes, compared to 29.4% in the highest risk category. (Table 3)

Discussion

This is the first large dataset of home PD patients' and dependency scores. Further in-depth analysis will be conducted to examine the relationship between interventions and outcomes. This dependency tool has the potential to flag service need which aids appropriate workforce planning, but more importantly the data interrogation could expose predictive patterns that identify risk and outcome measures that may improve service provision and patient care.

Table 1

Deaths within 180 days of assessment

Category_at_assessment	Status_at_180_days_post_assessment		Total
	Alive	Dead	
1. Score >20, category 1, visits - daily of alternate days	562 70.6 %	234 29.4 %	796 100 %
2. Score 12-20, category 2, visits - daily or twice a week	2223 77.2 %	655 22.8 %	2878 100 %
3. Score 6-12, category 3, visits - once or twice a month	4639 84.4 %	860 15.6 %	5499 100 %
4. Score 3-6, category 4, visits - six weekly	1675 92.4 %	137 7.6 %	1812 100 %
5. Score <3, category 5, visits - three monthly	997 94.6 %	57 5.4 %	1054 100 %
Total	10096 83.9 %	1943 16.1 %	12039 100 %

$\chi^2 = 385.774 \cdot df = 4 \cdot Cramer's\ V = 0.179 \cdot p = 0.000$

Table 2

Risk of peritonitis/exit site infection

Category_at_assessment	Infection_status_at_next_assessment		Total
	Infection	No infection	
1. Score >20, category 1, visits - daily of alternate days	125 9 %	1263 91 %	1388 100 %
2. Score 12-20, category 2, visits - daily or twice a week	538 11.9 %	3992 88.1 %	4530 100 %
3. Score 6-12, category 3, visits - once or twice a month	842 8.4 %	9170 91.6 %	10012 100 %
4. Score 3-6, category 4, visits - six weekly	224 5.3 %	3984 94.7 %	4208 100 %
5. Score <3, category 5, visits - three monthly	83 2.8 %	2856 97.2 %	2939 100 %
Total	1812 7.9 %	21265 92.1 %	23077 100 %

$\chi^2 = 248.136 \cdot df = 4 \cdot Cramer's\ V = 0.104 \cdot p = 0.000$

Table 3

Time until next visit

Category_at_assessment	Length_of_assessment				Total
	1. 0-30 minutes	2. 31-60 minutes	3. 61-120 minutes	4. More than 120 minutes	
1. Score >20, category 1, visits - daily of alternate days	150 11.9 %	440 34.9 %	301 23.9 %	371 29.4 %	1262 100 %
2. Score 12-20, category 2, visits - daily or twice a week	882 20.2 %	2377 54.5 %	783 17.9 %	321 7.4 %	4363 100 %
3. Score 6-12, category 3, visits - once or twice a month	2432 25.2 %	5435 56.3 %	1419 14.7 %	360 3.7 %	9646 100 %
4. Score 3-6, category 4, visits - six weekly	1155 28.6 %	2310 57.1 %	517 12.8 %	60 1.5 %	4042 100 %
5. Score <3, category 5, visits - three monthly	1020 39.6 %	1322 51.4 %	207 8 %	25 1 %	2574 100 %
Total	5639 25.8 %	11884 54.3 %	3227 14.7 %	1137 5.2 %	21887 100 %

$\chi^2 = 2345.189 \cdot df = 12 \cdot Cramer's\ V = 0.189 \cdot p = 0.000$

Poster number: 111

Submission number: 609

Outcome of medical Tenckhoff catheter insertion in Royal Wolverhampton Hospital

Dr Tariq Aljemmali, Dr Shashidhar CHERUKURI, Specialist Nurse Jenny Bayliss

Wolverhampton, UK

Dr Tariq Aljemmali

Biography
Nephrologist and Transplant lead consultant at RoyalWolverhampton Hospital

Abstract

Introduction

Medical Tenckhoff catheter insertion is the main procedure to start patients on peritoneal dialysis in Royal Wolverhampton Hospital. Ninety percent of Peritoneal dialysis patients had medical insertion of Tenckhoff catheter.   Transcutaneous insertion is the main approach. Kimal (Curled long straight with two cuffs) is the tube used in our trust. Patient receives bowel prep 48 hours prior to procedure. Some patients start laxative immediately after the procedure for the following next two weeks. Peritoneal dialysis team flushes catheter after seven days and start dialysis training after fourteen days.

Methods

12 months medical insertion data is collected using patients medical notes, renal electronic system (eMed) and Peritoneal team documentation. Surgical inserted catheters were excluded as their number is small.

Result

From December 2021 until December 2022, 33 Tenckhoff catheters were inserted for 30 patients (three patients needed re-do procedure). These catheters were inserted by consultant one (16 of 33), consultant two (13 of 33) and speciality registrar (4 of 33). Only two catheters were inserted as inpatient setting. Only one catheter had exit site bleeding complication needed emergency department admission.

63% of patients were male and 37% of patients were female. At three weeks point post procedure , 7 catheters failed of the 33 catheter. At three months point, another 5 catheter failed of the 26 catheter left. And at 12 months, 4 catheters failed of the 21 catheters left.

Reasons for catheters failure at three months including three weeks' time point and three months' time point are high sat catheters (5 of 33), patients wish to stop (2 of 33), fibrin sheath (2 of 33), pleural leak (1 of 33), infection (1 of 33) and Lastly kinked catheter (1 of 33). It is unclear whether the six failed catheters, which had unfavourite position, immigrated to that position or they were sat high during procedure. There were no differences in rate of catheters in the unfavourite position among operators, Consultant one (3 catheters were in unfavourite position of the 16 catheters done), consultant two two (2 catheters were in unfavourite position of the 13 catheters done), and Specialty registrar (1 catheter was in unfavourite position of the 4 catheters done).

At three months point, in these six catheters (five in unfavourite position and one kinked) , male to female ratio was 1 to 1. 5 of the catheters were for patient with BMI between 24 to 28, and one patient had BMI of 33.Within three months point, Patients who had catheters in unfavourite position were all constipated and 50 % with significant poor mobility. Only one catheter was successful of the three re-do catheters.

At 12 month another four catheters failed, two due to catheter immigration to unfavourite position, one cardiac death and one pleural leak. At 12 months, only 16 patients of the 30 patients were still on Peritoneal dialysis.

Discussion

All in all, medical insertion of Tenckhoff catheters is safe procedure. In our cohort, tube immigration or unfavourite position in the first three months is 17% of total catheters. Up to 45% of patients dropped from peritoneal dialysis for different reasons. This highlight the need to maintain high rate for catheter insertion to maintain the peritoneal program. Medical Re-do catheters had high failure rate. Patients with poor mobility (wheel-chair bound) had failed peritoneal dialysis early.

Establishing an urgent start peritoneal dialysis service – a KQuIP project.

Mrs Abigail Bugler, Mr Matthew Gayles, Mr Augusto Sancho, Dr Helen Campbell

North Bristol Trust, Bristol

Mrs Abigail Bugler

Biography
community dialysis nurse

Abstract

Introduction

Haemodialysis (HD) remains the predominant renal replacement therapy across the UK in patients admitted with acute kidney injury and end stage kidney disease. Peritoneal dialysis (PD) is an effective treatment for patients requiring urgent dialysis therapy. Our proposed change idea was to implement a safe and effective urgent start PD service which subsequently facilitated dialysis at home post discharge from hospital. Our aim was to enhance patient experience by giving choice in acute dialysis modality, improve access to home therapies, avoid vascular access procedures and time spent on HD and free up acute and in-centre HD slots.

Method

We produced a process map and a driver diagram, highlighting areas of improvement. We chose urgent start PD as a change priority and produced PDSA cycles. This allowed us to make achievable goals, timeframes and ensured we had vital services in place. Patients received tidal automated peritoneal dialysis (APD). A treatment protocol and patient pathway was developed over 12 months with regular reviews of the successes, challenges and improvements required. Quantitative measurements included number of patients, demographic data, treatment received, outcome on discharge from hospital and complications. Challenges to successful urgent start PD were worked through using PDSA cycles of change.

Results

The urgent start PD pathway was commenced in December 2022. Data presented is from December 2022 to January 2024, inclusively.

Table 1

Number of patients	15 (just over 1/month)
Age	51 yrs 6 months (range 19-86yrs)
BMI	25.7 (range 16-39)
"crash landers"	6
Known to renal services	9 2 sudden drop in GFR 1 HD access failure and difficulties creating more 6 late referrals for PD tube insertion (mean GFR 6, range 4-8)
No. of patients who had urgent start PD	7
No. of patients who started PD electively 1-2 weeks later	8 (X4 had some HD while waiting for PD to start*)
Number of patients who remained on PD	11
Number of patients not on PD	4 x2 malposition and patients left PD, adhesions, lack of patient engagement after 4 months.
Complications	X1 SC leak (BMI>35) X3 malposition all laparoscopically repositioned. Constipation related. X1 non-functioning due to multiple intra-abdominal adhesions

Discussion

The urgent start PD service has successfully delivered the option of PD for patients requiring urgent dialysis therapy and also facilitated patients to start on PD in a timely fashion. It transpired that the pathway was not only used for patients requiring urgent start PD but also for patients requiring urgent PD tube insertion when the elective pathway could not deal with the service demand.

Engagement and availability of all relevant staff was vital alongside the production of a robust protocol. An ongoing culture change is slowly happening within the department with urgent start PD now an established modality of acute dialysis therapy.

Regular reviews have recognised areas of success and challenge. Challenges include bowel prep administration pre-PD tube insertion due to the busy ward environment, lack of familiarity of a new protocol and rearrangement of surgery timings due to acute theatre capacity issues.

Maintaining competencies with a high turnover of inpatient nursing staff has also been challenging. This was supported by a clinical education ward nurse who trained and was a point of contact for ward staff. The ward staffs increased experience in PD will help to sustain this service for the future. The community dialysis team remain a point of contact for more expert support.

In the future we are considering local anesthetic PD tube insertions to save on theatre capacity and admission of patients. We have shared our project progress and learning across the region and hope to encourage other units in adopting urgent start PD programs.

References (if any)

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

Poster number: 113

Submission number: 81

Examining the acceptability and feasibility of the Compassionate Mindful Resilience (CMR) programme in adult patients with chronic kidney disease: The COSMIC Study

<u>Ms Anna Wilson</u>[1], Dr Clare McKeaveney[1], Dr Claire Carswell[1,2], Ms Karen Atkinson[3], Ms Stephanie Burton[1], Dr Clare McVeigh[1], Dr Lisa Graham-Wisener[1], Dr Erika Jääskeläinen[4], Mr William Johnston[1], Mr Daniel O'Rourke[1], Prof Joanne Reid[1], Dr Soham Rej[5], Mr Ian Walsh[1], Prof Helen Noble[1]

[1]Queen's University Belfast, Belfast. [2]University of York, York. [3]MindfulnessUK, Tauton. [4]University of Oulu, Oulu. [5]McGill University, Montréal

Ms Anna Wilson

Biography

Anna Wilson is the Research Assistant for the COMIC Study, which aims to assess the feasibility of a mindfulness intervention to support the mental health and wellbeing people living with kidney disease. Anna holds a BA Hons 2.1 and MSc Pass with Distinction from Queen's University Belfast. She previously held the post of Administrator for the Renal Arts Group, a collaborative research group based within the School of Nursing and Midwifery, which aims to support the mental health and wellbeing of people with kidney disease through engagement with the arts. Anna commenced a PhD in October 2023 exploring holistic approaches, such as social prescribing, to support the mental wellbeing of this patient population. Twitter/X @AnnaWilson444

Abstract

Introduction

People with advanced kidney disease face multiple challenges associated with the disease and renal replacement therapy such as increased anxiety and depression. Access to psychological and emotional support is not well provided or funded and Kidney Care UK (KCUK) was keen to explore the feasibility of delivering mental health support via virtual means to significantly reach and support more patients with mental wellbeing needs. The aim of this study was to support a new service development project with KCUK by implementing the Compassionate Mindful Resilience (CMR) programme, developed by MindfulnessUK, and explore its feasibility for patients who have chronic kidney disease in stages 4 and 5 or who have received transplants.

Methods

A multi-method single-group feasibility design was utilised. Participants (n=75) over 18 years, from the UK, with stage 4 or 5 kidney disease or post-transplant, and who were not currently undergoing

psychotherapy, were recruited to the study and participated in the four-week CMR programme. Data was collected at baseline, post-intervention and at three-months post to measure anxiety, depression, self-compassion, mental wellbeing, resilience, and mindfulness. Qualitative interviews were conducted with participants and the Mindfulness Teacher to explore the feasibility and acceptability of the intervention for a kidney disease population.

Results

In total, 65 participants completed the CMR programme. The majority were female (66.2%) and post-transplant (63.1%). Analysis of completed outcome measures at baseline and post-intervention timepoints (n=61), and at three-months post intervention (n=45) revealed significant improvements in participant's levels of anxiety and depression, self-compassion, mental wellbeing, resilience, and mindfulness.

Thematic analysis of participant interviews (n=19) and the Mindfulness Teacher (n=1) identified three themes (and nine-subthemes); experiences of the CMR programme that facilitated subjective benefit, participants lived and shared experiences, and practicalities of CMR programme participation. All participants interviewed reported that they found participating in the CMR programme to have been a beneficial experience.

Discussion

The findings suggest that the CMR programme has the potential to improve psychological outcomes among people with advanced kidney disease. The research team are currently developing an application for a randomized controlled trial are required to further test the effectiveness of the CMR programme.

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Poster number: 114

Submission number: 162

Exploring understanding and experience of social prescribing to support health and wellbeing in people with kidney disease – a study protocol.

Ms Anna Wilson, Prof Helen Noble, Dr Karen Galway, Dr Julie Doherty

Queen's University, Belfast

Ms Anna Wilson

Biography
PhD Student, School of Nursing and Midwifery

Abstract

Introduction

Social prescribing is an approach which links people to a range of activities and support services typically provided by local voluntary and community sectors to address non-medical or social determinants of health and wellbeing. Patients are referred, often by a GP or other healthcare professional, to a link worker, who work with the patient to co-produce a personalised care and support action plan, their own 'social prescription'. Social prescribing has been identified as part of the NHS Long-Term Plan, enabling people to have more control over their own health, and is a key component of the NHS Universal Personalised Care Comprehensive Model. While it remains a new approach, early evidence has indicated that engaging with social prescribing programmes can improve self-esteem, confidence, mental wellbeing, and reduce anxiety and depression for patients with long-term mental and physical health conditions. This approach may have the potential to support the health and wellbeing of people living with kidney disease, who are impacted by a higher prevalence of anxiety, depression, and social isolation than the general population.

The aim of this study is to explore the understanding and experiences of social prescribing to support health and wellbeing in people with kidney disease throughout the UK. The objectives of the study are to:

• Identify current provision and implementation of social prescribing programmes for people living with kidney disease, and other long-term conditions.

• Identify the current knowledge and understanding of social prescribing for both people living with kidney disease, and healthcare professionals who provide care to people living with kidney disease.

• Explore the experience of social prescribing and need for holistic approaches to care, for people living with kidney disease, healthcare professionals, link workers, and organisations providing community-based activities.

• Develop a resource to support people with kidney disease to engage with social prescribing services and activities.

Methods

This study will adopt a sequential exploratory multi methods design consisting of four phases.

Phase 1 - Undertake a scoping review of research evidence and grey literature which reports on the provision and implementation of social prescribing programmes for adults living with long-term conditions.

Phase 2 - Conduct a UK-wide cross-sectional online survey with people living with kidney disease and healthcare professionals providing care to people with kidney disease, to identify current understanding and knowledge of social prescribing for this patient group.

Phase 3 - Conduct in-depth semi-structured interviews with people living with kidney disease, healthcare professionals providing care to people with kidney disease, link workers, and community organisations providing social prescribing activities.

Phase 4 - Develop a resource, informed by data collected in phase 1-3 and in collaboration with the study advisory group. This resource will aim to support engagement with social prescribing services and activities.

Results

The protocol for the ongoing study will be presented.

Discussion

This study will explore understanding and experience of social prescribing from the perspective of people living with kidney disease, healthcare professionals and those providing referrals and activities. Results will inform future implementation of SP approaches to support the health and wellbeing of people with kidney disease.

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Poster number: 115

Submission number: 90

International maPping exercise of Arts Interventions in reNal uniTs: the PAINT project

Dr Trisha Forbes, Ms Anna Wilson, Dr Clare McKeaveney, Dr Claire Carswell, Professor Helen Noble

Queen's University Belfast, School of Nursing and Midwifery

Dr Trisha Forbes

Biography
Dr Trisha Forbes has around 15 years of research experience in a variety of fields and methodologies. Since the completion of her PhD in 2017, which was a qualitative inquiry exploring young people's perceptions of suicide and their feelings of connectedness to the community, she has worked as a Postdoctoral Research Fellow in the broad area of mental health research. For example, iAmAWARE was a mixed methods project about mental health in the workplace and the PETT study was a pilot RCT of talking therapies for Post-Traumatic Stress Disorder in military veterans. Most recently, Trisha is bringing her experience to the role of Research Fellow within the Renal Arts Group in Queen's University Belfast, School of Nursing and Midwifery. She is currently working on the ACORN Study, which explores caregiver experience of conservatively managed end-stage kidney disease and the PAINT Project, an international mapping exercise of arts interventions in renal units. Trisha is also an active Board member of the Northern Ireland Mental Health Arts Festival.

Abstract

Introduction

People living with end-stage kidney disease (ESKD) often experience reduced quality of life[1], depression and a higher prevalence rate for anxiety compared to the general population[2]. Using the arts to promote and support health and wellbeing has received ongoing attention since the publication of the All-Party Parliamentary Group on Arts, Health and Wellbeing report in 2017 outlining the benefits of the arts on psychological, social and physical health and wellbeing[3], and the World Health Organisation 2019 report on the evidence for arts[4].

The Renal Arts Group (RAG) is a collaborative research group established in 2016 between patients with ESKD, carers, clinicians, academics, and artists to develop a programme of research aimed at developing and evaluating arts interventions to improve the physical and psychological quality of life of those living with kidney disease. This programme of research includes the PAINT project, which includes an international mapping exercise to identify the current provision of arts programmes for renal patients across the world. Collaborators include a consortium made up of members of RAG in partnership with arts programmes based in the Philippines, United States, Ireland and at the World Health Organisation.

Methods

A mixed methods approach was adopted to identify the current provision of arts interventions in renal units globally. An online survey was conducted using Qualtrics and a series of semi-structured interviews were conducted with individuals from units identified from the survey to further explore the delivery of arts activities.

Results

The PAINT Survey was live from January to October 2023. 118 responses were collected from participants representing 29 countries. There was a wide range of respondents in terms of role - i.e. consultant nephrologists, nephrology fellows, arts manager/coordinator, nurses. 39 respondents (33%) indicated that arts activities are available to patients in their units. The main barrier for those who did not have arts activities available in their units was a lack of resource in some regard. Arts activities were mostly delivered to adult patients undergoing haemodialysis.

In terms of the qualitative interviews, 16 individuals representing 11 countries took part. These semi-structured interviews further explored themes emerging from the survey data and developed the benefits and challenges of implementing arts activities for renal patients. Preliminary themes and sub-themes identified include:

- Positive outcomes for patients
    1. Increased wellbeing
    2. 'Happier' coming to dialysis
    3. More positive in their outlook
    4. Lower levels of boredom
- Staff engagement and enthusiasm
    1. Types of arts activities
    2. 'Legacy' of the patients (e.g. exhibitions / publications)
- Barriers to participation
    1. Resources – funding and staffing
    2. Infection control
    3. 'Red tape'
    4. Developing countries – emphasis on 'surviving rather than thriving'

Discussion

By providing an overview of what is being offered globally in terms of arts activities for renal patients, the PAINT project will identify policy recommendations for future development of arts in health programmes.

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Poster number: 116

Submission number: 331

Implementation of a new pathway supporting vulnerable patients on heamodialysis

Annette Dodds

University Hospitals Birmingham, Birmingham

Annette Dodds

Biography
I have over 28 years experience as a renal nurse, working as a junior sister on a renal ward, specialising in CAPD then as a CNS in advanced kidney care before becoming matron for dialysis in 2018.

Abstract

It is recognised that the patients attending for dialysis are increasingly co-morbid and complex, however little has been discussed about the increasing numbers of vulnerable patients including those with learning disabilities. This abstract, outlines the implementation of a pathway to support these vulnerable dialysis patients.

In June 2018, NHS improvement produced Learning Disability Improvement Standards to improve access to services. Further documents were also published including,

• Improvements in care of patients with a Learning Disability recognised in the NHS Long Term Plan (Jan 2019)

• 'Right to be heard': The Government's response to the consultation on learning disability and autism training for health and care staff (Mandated - Nov 2019)

In July 2020, the Vulnerabilities team within this NHS Trust, launched the Trust Learning Disability and Autism strategy. The strategy incorporated training, raising awareness and development of standards and implementation of an in-patient pathway. Due to the significant numbers of vulnerable patients being identified amongst the dialysis population, this author decided to adapt this inpatient pathway for the chronicoutpatient haemodialysis programme. This process was completed with the support of the vulnerabilities team and launched in the dialysis units in July 2021.

The pathway involved all patients with a diagnosis of LD being identified, passports being completed and uploaded to the main Trust IT system so available if these patients were admitted to hospital. A monthly risk assessment form was also completed to ensure patients were receiving the care they required and were fully supported, carers identified, adaptations made as required, mental capacity assessments completed and best interest meetings arranged.

Quarterly meetings were initiated across the HD service with the link nurses on each unit attending to feedback on progress and to seek advice from the vulnerabilities team. In these meetings it was identified that there were other vulnerable patients suffering with dementia, mental health problems and young adults between the ages of 16 and 25 who also required support. As the Trust developed inpatient pathways for these other vulnerable patients, the pathways were again adapted for dialysis. Staff have received education and training and feel much more confident in raising concerns and supporting their vulnerable patient population.

1500 patients attend regular Haemodialysis sessions within this author's NHS Trust, across 15 dialysis centres (2 being in acute Hospital settings). A recent audit has identified 31 patients with LD and Autism, 16 patients with dementia, 33 with diagnosed mental health problems and 10 young adults. 75% of our vulnerable patients are cared for within the 13 satellite units utilising the vulnerabilities pathway.

Implementation of this pathway has enabled the dialysis nursing teams to be able to identify vulnerable patients and confidently ensure that they are supported and cared for appropriately as outpatients.

Poster number: 117

Submission number: 432

Does the type of dialysis access contribute to depression in Haemodialysis patients?

<u>Tamasin Stevenson</u>, Marissa Irasga, Monique Smith, Alin-Petru Ivan, Carmen Ciobanu, Heidi Jimenez, Leah-Kate Butler, Sarah Whitehouse, Anna Tonolete, Stephanie Walker, Dr Jyoti Baharani

University Hospitals Birmingham, Birmingham

Tamasin Stevenson

Biography
I have always had an interest in vascular access since working with chronic and acute renal patients, so when the opportunity arose several years ago to be an Access Nurse Specialist this was a great chance to enhance and improve my knowledge. I have enjoyed the challenge and I am passionate in vascular access care and education of both nurses and patients. I am now in the position of Lead Renal Access Nurse for UHB. I work closely with the vascular surgeons and renal team to provide the best possible care for our dialysis patients.

Abstract

Introduction

Haemodialysis (HD) remains the most prevalent treatment used for end stage kidney disease (ESKD) patients in the UK and for most patients on HD; an arteriovenous fistula (AV) fistula is the preferred form of vascular access.

Depression is common in HD patients and may be related to type of dialysis access. Our aim was to investigate potential associations between vascular access type and depression.

Methods

We used the Becks Depression Inventory to measure depression across a random sample of HD patients. This was collected across 3 satellite dialysis units, home HD patents and the main dialysis hub over a 4-week period.

Results

101 patients returned the survey, and the data was collected from the PROTON database, 8 patients were unidentifiable, so the vascular access of the patients was unknown (55 male and 38 female).

88.3% of patients had an AVF and 10.6% had a tunnelled central venous catheter (CVC) and 1.1% an AVG (Arteriovenous Graft). No significant differences were found between access type use, in terms of gender, presence of diabetes, hypertension, or peripheral artery disease.

Out of the 101 patients surveyed almost half had some degree of depression.

11.9% of patients had mild mood disturbances. 12.9% Borderline clinical depression. 14.9% of patients had Moderate depression, 6.9% of patients had severe depression and 0.1 % had extreme depression (Figure 1).
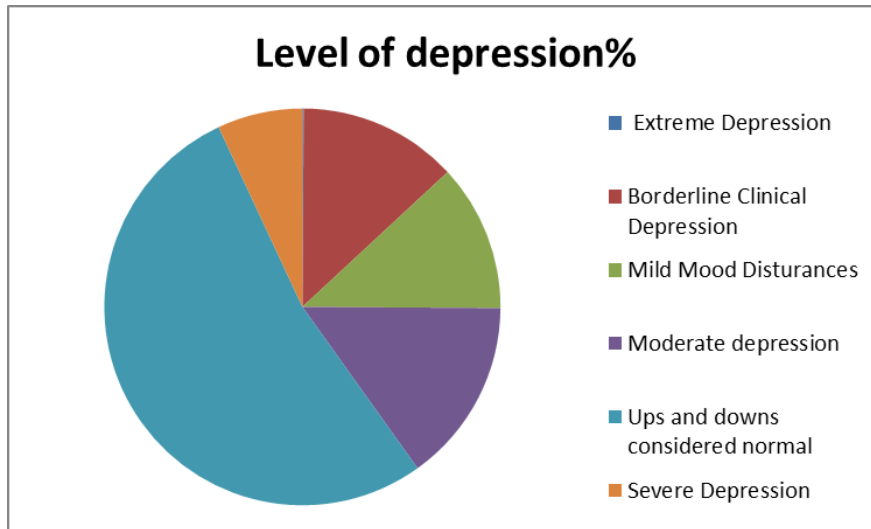
Figure 1

Figure 2 shows that in this group of patients, there was no statistically significant association of depression with type of access, although patients with lines were more likely to have extreme depression.
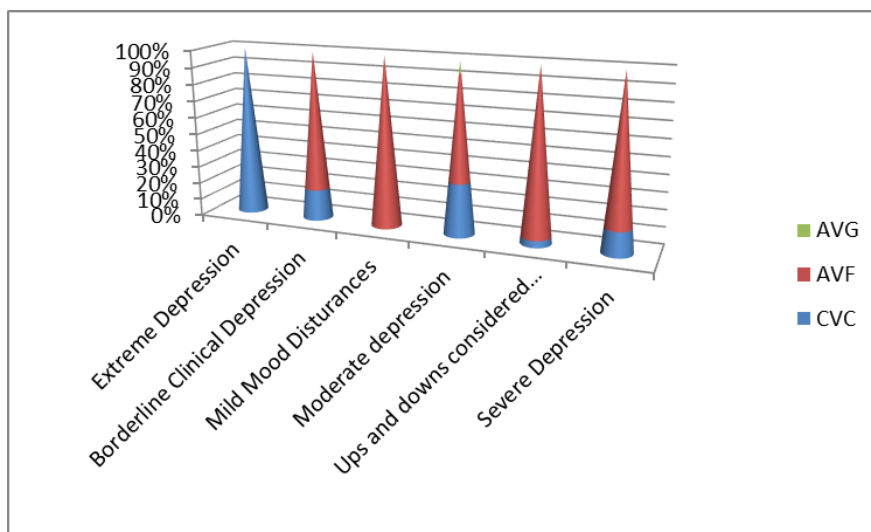
Figure 2

Discussion

In our small sample, we could not show a statistically significant association between depression and type of dialysis access. We have a high number of patients with AVF, so this may have contributed to the results. Half the surveyed population of HD patients had some degree of depression. We would recommend that dialysis services routinely screen this population for depression and signpost patients to appropriate services as needed.

Poster number: 118

Submission number: 439

Association of psychological wellbeing and exposure to natural environment in people living with chronic kidney disease

Dr Eleanor Taylor[1], Dr Courtney Lightfoot[2], Ms Ella Ford[2], Ms Gurneet Sohansoha[2], Ms Roseanne Billany[2], Dr Ceri Jones[1], Prof Alice Smith[2], Prof Noelle Robertson[1]

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Dr Eleanor Taylor

Biography
Eleanor is a Trainee Clinical Psychologist and this research forms part of her Doctorate in Clinical Psychology qualification. After completing her undergraduate and master's degrees at the University of Bristol and Bath respectively, Eleanor then moved to the University of Manchester to complete a PhD, and subsequently a year as a post-doc, investigating neurocognitive function in substance dependence. She then moved to the University of Leicester where she worked in clinical trial management for four years until returning to psychology and beginning her clinical training amidst the COVID pandemic.

Abstract

Introduction: The natural world is long established to be beneficial to human health and wellbeing, including for people with long-term conditions such as chronic kidney disease (CKD). Long-term conditions are often associated with mental health difficulties (Naylor et al., 2012), which can result in poorer outcomes. For people with CKD, depression symptoms are associated with increased mortality (Chilcot et al., 2018). The aim of this study was to explore the association between access to nature and the psychological wellbeing of people with CKD.

Methods: Participants from nine UK NHS sites were invited to complete an online survey comprising the 12-Item Short Form Health Survey (SF-12), Patient Activation Measure (PAM)Click or tap here to enter text., General Practice Physical Activity Questionnaire (GPPAQ), the Distress, Anxiety, Stress Scale (DASS-21) and bespoke questions relating to access to nature, from which a total "nature" score was generated. The participants included those with CKD (non-dialysis [NDCKD], n=188, kidney transplant recipients [KTR], n=70, haemodialysis [HD], n=40 and peritoneal dialysis [PD], n=21), and their relatives/ close friends [significant others, SO] n=48). Data were analysed using ANOVA and associations were examined using multiple linear regression analysis, and using Chi-squared test.

Results: No significant differences were found between CKD and SO groups for patient activation, although SOs reported significantly more physical activity on the GPPAQ than the CKD groups (p=0.049). For measures of psychological wellbeing, SO were significantly less anxious than NDCKD (p=0.007), KTR (p<0.001), and HD (p<0.001), but not PD (p=0.873), and reported less stress than KTR (p=0.056) although

not statistically significant. On the SF-12, SOs also reported significantly higher physical component scores than all kidney patients (NDCKD p=0.001, KTR p=0.001, HD p<0.001, PD p=0.008), and significantly higher mental component scores than HD (p=0.026), but not NDCKD p=0.526, KTR p=0.181, or PD p=1.00). There were no between group differences in self-reported depression (p=0 .092). SOs had marginally higher nature involvement than all kidney patients although this was not statistically significant (NDCKD p=0.343, KTR p=0.084, HD p=0.077, PD p=0.059).

In CKD, total nature scores were significantly associated with lower depression (p<0.001) and anxiety scores (p=0.019), but not with stress scores (p=0.077), meaning that the greater the nature involvement, the lower the depression and anxiety. Similarly, total nature scores were significantly associated with increased SF-12 mental component summary scores (p=0.002), but not SF-12 physical component summary scores (p=0.053), meaning that the more nature involvement, the higher the mental component score, as an indicator of increased quality of life (QoL).

Discussion: Access to nature appears to support a role for the value of the natural world in improved psychological wellbeing for patients with CKD. Healthcare professionals should encourage people with CKD to engage with the natural environment. This exploratory data could inform the development of nature-based interventions for people with CKD to improve QoL and life participation.

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Poster number: 119

Submission number: 513

Facilitating dialysis concordance with complex patients: the role of the renal social worker

Margaret Eyre, Janet Hopkins

City of York Council/York and Scarborough NHS Hospitals Trust, York

Margaret Eyre

Biography
Qualified as a social worker in 1986, post qualifying award 2007; have been in frontline services ever since, including a spell acting up into a management post in the hospital team. Hospital social worker 1993-2012, renal social worker since 2012; previously employed for seven years as a specialist social worker with visually impaired people as part of a sensory impairment team. Member of UK Renal Social Work Group, representative of this group on the UKKA Professional Council from 2016 to 2023. Member of National Renal Psychosocial Working Group. Member of psychosocial group contributing to 2020 Workforce Planning document and on recent update. Involved in Yorkshire and Humber renal network psychosocial project. Practice educator since 1991 – have supervised over 30 students and mentored colleagues completing practice educator training, with additional freelance work for University of York. Qualified as Best Interests Assessor (Deprivation of Liberty Safeguards) in 2009; planning to transfer to become an Approved Mental Capacity Professional under the new Liberty Protection Safeguards. 2014-16 worked as part of multi-disciplinary team in A&E designed to prevent hospital admission, and since late 2017 have worked in the weekend hospital discharge team.

Abstract

Introduction

Dialysis burnout is a well-recognised problem, especially for those ineligible for transplant or very difficult to match, and renal social workers often support the most complex and vulnerable patients. Research has shown the importance of retaining hope in managing long-term conditions, but patients' ability to cope depends on the interplay of many factors, both internal and external.

Methods

During our monthly dialysis meetings, we review patients who are seemingly playing with fire by ignoring symptoms of severe illness and continuing to struggle into work, by refusing to prioritise their dialysis over other activities and missing or shortening sessions, or by failing to comply with dietary advice and prescribed medications. Such issues frequently lead to extended discussions at our monthly psychosocial meetings on the best way to proceed.

For our annual audit presentation my social work colleague and I decided to examine more closely the factors that help patients comply with treatment and the challenges facing them, with the aim of educating the MDT and informing our own interventions.

Results

Protective factors include good family and social support, firm values, resilience, and inner resources, usually the result of a secure upbringing, as well as a good understanding of health issues, access to supportive staff and a high degree of acceptance.

Conversely, research has shown that those with neurodiversity or serious mental health problems, often due to trauma or adversity, fare less well on dialysis and die earlier than their peers, and caring for those with autism and ADHD is a particular challenge for us. People with intellectual disabilities often have limited insight into their condition, and the statistics for early deaths for those with learning disabilities and/or autism are stark indeed, with 42% deemed avoidable, as opposed to 22% of the general population*.

Patients may miss sessions and neglect their health because poverty and lack of access to sick pay force them to continue working, and fatigue and low income lead them to eat low-cost convenience foods rather than cooking from scratch. Others, especially younger people, may strive to ignore their health issues due to a desire to lead a "normal" life, and carers of any age may try to minimise their problems as they focus on their caring responsibilities.

Discussion

Renal social workers act as a bridge between health and social care, educating involved parties about the challenges of kidney failure and advocating for patients. We provide tailored emotional, practical and material support, helping patients maximise their income, setting up care packages and referring for equipment and other services. A strengths-based approach can encourage patients towards greater self-management and thus self-belief, helping break down barriers to home dialysis such as unsuitable housing. Furthermore, a grant to ease the financial pressure or provide a long-awaited holiday can help enormously in lifting a patient's mood by giving them a break from the seemingly never-ending drudge of dialysis.

References

*LeDeR report, 2022 (published November 2023, London)

Poster number: 120

Submission number: 522

Smartphone/tablet-based gaming apps to deliver patient-led cognitive gamified training in haemodialysis patients (PACE Pilot Study)

Mr Murat Aksoy[1], Mrs Samantha Hunter[2], Dr Aziz U. R. Asghar[1], Professor Sunil Bhandari[2,3]

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Professor Sunil Bhandari

Biography
Prof Bhandari graduated from the University of Edinburgh and trained in Renal and Transplant Medicine in Yorkshire (UK) and Sydney Australia. He is a Consultant in Nephrology and Honorary Professor at Hull York Medical School (HYMS) and Hull University Teaching Hospitals NHS Trust; Co-Director of UK Advanced Nephrology Course and Deputy Head of the School of Medicine for Yorkshire and Humber. Prof Bhandari leads in collaboration with a research programme based around renal anaemia, CKD progression and the effects of iron therapy on cardiac and renal function. Ongoing collaborative translational research includes the effects of iron therapy in uraemic cardiomyopathy and mitochondrial function, and the effects of patient-led cognitive gamified training intervention on cognitive decline during haemodialysis therapy.

Abstract

Introduction: Patients undergoing haemodialysis often experience cognitive impairment and progressive memory loss, leading to increased reliance on others for their day-to-day care. This study explores the use of smartphone/tablet-based gaming apps to provide patient-driven cognitive gamified training (CGT) for people receiving haemodialysis, without direct intervention from healthcare professionals. We postulate that CGT may lead to slower cognitive decline and improved quality of life, well-being and functional capacity compared to those with standard care.

Methods: This single-centre, two-armed pseudo-randomised pilot study consisted of three stages. Phase-1: researchers assessed and shortlisted commercial cognitive training programs. Phase-2: patient focus group engagement meetings were provided with CGT apps for evaluation/feedback. Based on feedback, two cognitive training apps (Lumosity and Peak) were selected. Phase-3: an open-label trial with 47 participants (November 2022-January 2024). The CGT group were recommended to use apps for at least 30minutes per dialysis session over four months. The following assessments were recorded at baseline and after four months.

1) Primary assessments: MoCA, 3MSE, and ROWMA.

2) Secondary assessments: PROM KDQoL-SF™ v1.3, PROMIS Global Health Instrument and EQ-5D.

Results: In total 47 people receiving haemodialysis were recruited for the PACE study; 21 in the CGT group (including 5 dropouts) and 26 in the control group (also including 5 dropouts). Baseline and follow-up data for the remaining 37 patients in these two groups showed that their mean cognitive scores for the MoCA and ROWMA were well below the values as would be expected for healthy participants but not for the 3MSE (Table 1). For 3MSE there was a significant difference between the baseline vs follow-up periods for the CGT study group, but no significance for the MoCA and ROWMA assessments (Table 1). For the control group, there was a significant difference between the baseline vs follow-up periods for the MoCA and ROWMA assessments but not for the 3MSE. No significant differences were found in the primary or secondary assessment scores between the CGT and control groups (baseline CGT vs baseline control, and follow-up CGT vs follow-up control, Mann Whitney U , $p<0.05$). The baseline and follow-up scores of secondary self-reported assessments are presented in Table 2.

Table 1: Primary baseline and follow-up cognitive and self-report assessments in haemodialysis patients.

Assessment	Healthy Participant Scores (from published literature)	CGT Study Group Patients (n=16)			Control Group Patients (n=21)		
		Baseline	Follow-up	Patients with increased follow-up scores (%)	Baseline	Follow-up	Patients with increased follow-up scores (%)
Primary							
Montreal Cognitive Assessment test (MoCA)	>26	22.4 ± 0.8	22.8 ± 0.7	63%	22.3 ± 0.7	23.6 ± 0.7 [†]	62%
Modified Mini-Mental State Exam (3MSE)	>78	84.6 ± 1.6	86.7 ± 1.5 [*]	81%	86.5 ± 2.1	90.7 ± 1.6	62%
Rapid Objective Working Memory Assessment (ROWMA)	>15	13.1 ± 0.5	13.8 ± 0.5	60%	13.0 ± 0.5	14.0 ± 0.4 [†]	57%

Data are mean and standard error of the mean.

[*]$p<0.05$ within CGT study group (baseline vs follow-up, Wilcoxon Signed-Rank Test).

[†]$p<0.05$ within control group (baseline vs follow-up, Wilcoxon Signed-Rank Test).

Table 2: Secondary baseline and follow-up self-reported assessments in haemodialysis patients.

Assessment	CGT Study Group Patients (n=16)		Control Group Patients (n=21)	
Secondary	Baseline	Follow-up	Baseline	Follow-up
Kidney Disease Quality of Life Short Form (KDQoL-SF™) v 1.3[a]				
SF-12 Physical Health Composite Score	35.5 ± 9.6	33.4 ± 9.1*	36.7 ± 10.2	35.7 ± 9.0
SF-12 Mental Health Composite Score	49.9 ± 7.2	47.7 ± 9.6	45.5 ± 9.4	48.1 ± 10.6
KDCS (Kidney Disease Component Summary)	64.9 ± 18.7	63.6 ± 21.2	63.3 ± 21.8	62.4 ± 23.1
Kidney-targeted Areas (KDQoL)	68.7 ± 18.2	67.9 ± 20.5	66.0 ± 22.1	66.4 ± 22.2
Health-Related Quality of Life (HRQoL)	57.0 ± 23.2	50.2 ± 24.3*	52.5 ± 28.5	54.3 ± 27.1
Patient-Reported Outcomes Measurement Information System (PROMIS) Global Health Instrument questionnaire[b]				
PROMIS Global Physical Health v1.2 T-score	39.8 ± 1.4	38.3 ± 1.4	40.7 ± 1.5	39.7 ± 1.4
PROMIS Global Mental Health v1.2 T-score	36.9 ± 1.1	37.6 ± 1.4	38.1 ± 1.1	38.5 ± 1.3
European Quality of Life Five Dimension (EQ-5D)[b]				
Mobility	2.3 ± 0.3	2.4 ± 0.3	2.2 ± 0.3	2.2 ± 0.3
Self-Care	1.6 ± 0.2	1.6 ± 0.2	1.4 ± 0.2	1.3 ± 0.1
Usual Activity	2.1 ± 0.3	2.3 ± 0.3	2.1 ± 0.2	2.2 ± 0.2
Pain/Discomfort	1.8 ± 0.2	2.4 ± 0.3*	2.0 ± 0.2	2.1 ± 0.2
Anxiety/Depression	1.4 ± 0.2	1.8 ± 0.2	1.8 ± 0.2	1.6 ± 0.2
Health Today	64.4 ± 5.6	52.8 ± 4.8	67.3 ± 4.2	62.1 ± 3.9

[a](Mean ± Standard deviation), [b](Mean ± Standard error of the mean)

*$p < 0.05$ within CGT study group (baseline vs follow-up, Wilcoxon Signed-Rank Test)

Discussion: The results of our pilot study suggest that the 3MSE assessment was sensitive in revealing a significant improvement in cognitive scores in haemodialysis patients receiving smartphone/tablet-based CGT for a 4-month period. Unexpectedly, for the control group we found significant improvements in the cognitive scores when utilising the MoCA and ROWMA assessments. Further research with a larger sample size and longer follow-up period is needed to ascertain if there are tangible benefits of CGT in slowing cognitive decline and improving quality of life for people receiving haemodialysis, and in determining the sensitivity of the cognitive assessments. In addition, examination of other factors such as age or other co-morbidity may be important.

Study Registration Number

IRAS project ID: 312024

Poster number: 121

Submission number: 149

Iron preparation and pre-infusion haemoglobin are associated with the likelihood of a second intravenous iron treatment in patients with CKD in an outpatient setting

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N/A, Plymouth

Mrs Jen McDermott

Biography
Lead Nurse Dialysis, CKD, AKI and YAW at University Hospitals Plymouth NHS Trust. Have worked in renal for 30 years

Abstract

Introduction: IV iron is recommended for the treatment of ID/anaemia in people with CKD pre-dialysis. Given the demands on the NHS, there is pressure to minimise additional IV iron infusions due to insufficient iron repletion. This service audit investigated whether the choice of ferric carboxymaltose (FCM) or ferric derisomaltose (FDI) for any given IV iron infusion influenced the likelihood of patients requiring a second course of treatment.

Methods: This was a retrospective audit of all IV iron infusions in patients with CKD in a single NHS trust, 1 Jan–31 Dec 2019. A logistic regression model (Firth's penalised maximum likelihood) was used to express the effect of iron preparation choice (FDI or FCM) on the probability of needing additional treatments within 3 or 6 months. The following independent variables were included: age, weight, gender, pre-infusion haemoglobin (hb), and whether patients received the correct iron dose or were under-dosed compared with unit dosing protocols. Treatments were excluded if the patient died during follow-up without a second treatment or if the iron dose was above unit dosing protocols. Treatments split across two infusion appointments within two weeks counted as a single treatment. Analysis was in R v4.1.1.

Results: In total, 361 IV iron treatments by 309 patients were included; 13.3% patients visited twice and 1.6% ≥3 times. The probability of a second treatment was significantly lower after initial administration of FDI vs FCM, within 3 and 6 months (Table 1, Figure 1). Age, weight and gender had no significant effect on the probability of an additional treatment. A large proportion of patients was under-dosed, but the model did not show a significant relationship between dose and likelihood of a second treatment. The odds of a second treatment within both timeframes were inversely proportional to the pre-transfusion Hb levels (Figure 2).
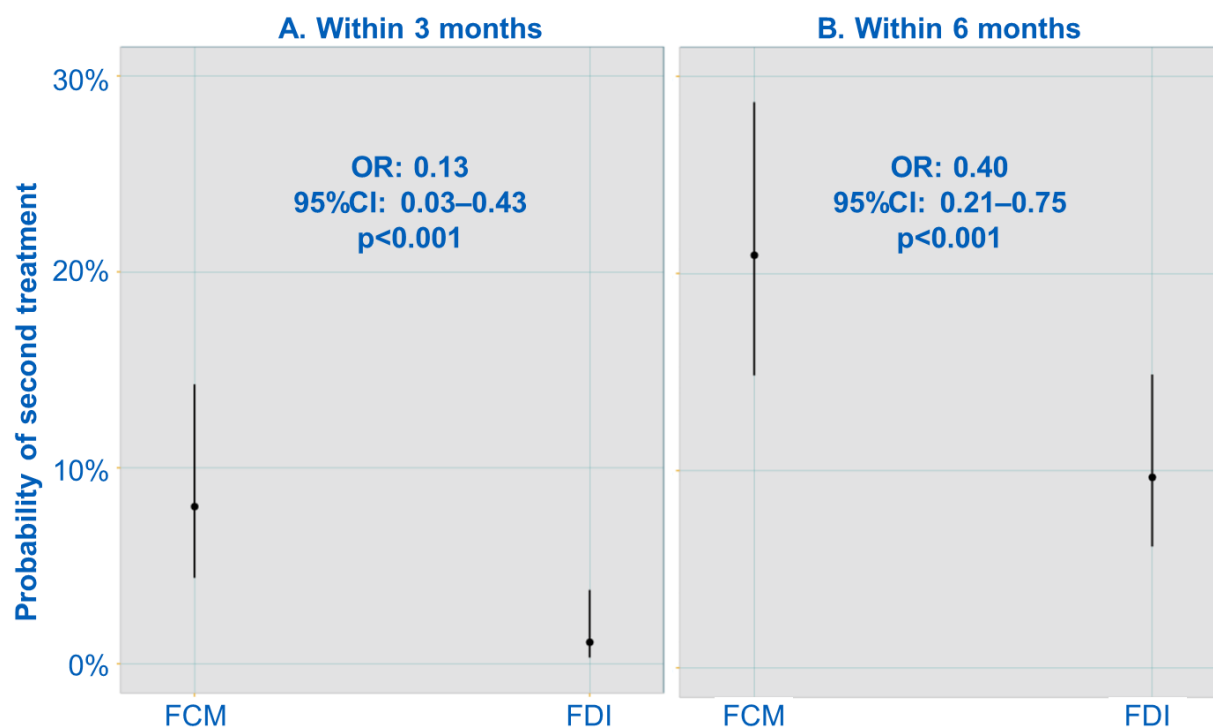
Figure 1. Probability of patients requiring a second treatment 3 months (A) and 6 months (B) after initial treatment with FCM or FDI. Bars are 95% confidence intervals

Dosing	Complete	Under-dosed	Over-dosed	Data missing
FCM	30	68	6	59
FDI	117	84	8	3

Table 1. Number of IV iron treatments by dose classification. Dose classifications were made by comparing the protocol dose (calculated based on patient characteristics and pre-infusion laboratory results, according to internal dosing protocols at the Unit) with actual dose given
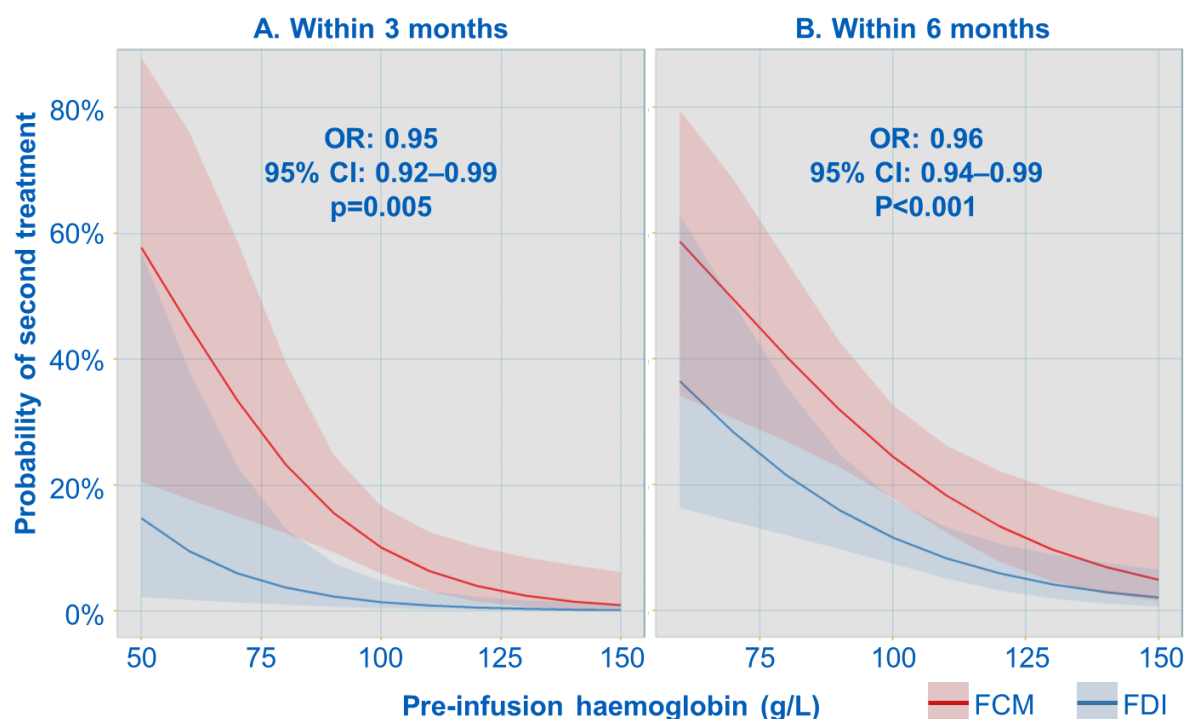
Figure 2. Probability of patients requiring a second treatment 3 months (A) and 6 months (B) after initial treatment with FCM or FDI as a function of baseline haemoglobin levels. Shaded areas are 95% confidence intervals. Odds ratios are for low vs high Hb, not between treatments

Discussion: Administration of FDI vs FCM, and lower vs higher baseline Hb, were associated with a significantly reduced chance of additional treatment within 3 and 6 months. This finding is relevant to services aiming to improve efficiency. This analysis is exploratory only and had several limitations: not all possible confounders were modelled due to lack of data; analysis assumed that patient deaths during follow-up were unrelated to iron need; and there were insufficient data to fully account for the effect of under dosing. The analysis also cannot inform on changing medications, as each treatment is considered in isolation from previous treatment.

Poster number: 122

Submission number: 174

Introducing the HIF-inhibitor Roxadustat as an alternate to traditional injectable ESA treatment

<u>Sr Yuqing Ye</u>, S/N Wendy Davis, Sr Jan Halliday, Dr Iain Moore

The Newcastle upon Tyne Hospitals NHS Trust, Newcastle upon Tyne

Sr Yuqing Ye

Biography
Lead nurse for the renal anaemia service at The Newcastle upon Tyne Hospitals NHS Trust.

Abstract

Introduction

Roxadustat, a newly available Hypoxia-inducible Factor inhibitor (HIF-inhibitor), was introduced to a selection of our CKD population in October 2022, following approval by NICE.

Patients had told us of their desire for an anaemia treatment that did not involve needles. When this HIF-inhibitor became available, we were keen to use it in particular for those who were needle phobic. Other advantages when compared with erythropoietin-stimulating agent (ESA) injection included no need for storage, no training required, and no assistance needed from health teams as to administration.

Methods

Roxadustat is an alternative to ESAs. Patients referred through to the anaemia service choose between commencing ESA and Roxadustat, assuming no contraindications to either treatment. Medical history was reviewed by the clinical team in advance, so as to exclude higher risk patients. Patients were iron replete before starting Roxadustat. Potential side effects of Roxadustat (in particular the raised possibility of thromboembolism) were explained fully prior to initiation. We recruited 16 patients in the first 3 months with stage 3-5 renal disease who were symptomatically anaemic and followed their progress over the subsequent 12 months.

Results

We recruited 16 patients in all across the period studied.

Six patients received IV iron during the programme. Adverse effects forced cessation in 1 patient who had heavy menses with clots after 6 weeks treatment although it is inconclusive if it related to Roxadustat. One patient developed a pulmonary embolism (PE) having stopped Roxadustat 6 weeks previously.

Three patients have switched to ESA due to commencing renal replacement therapy. Two patients died from causes unrelated to anaemia treatment. One patient recovered renal function. Two yellow cards were reported due to side effects.

Discussion

Roxadustat seems to be effective in treating our CKD stage 3-5 patients. In 90% of this group of patients, Haemoglobin (Hb) level rose 10-20 grams per litre after 2-3 weeks of initiation of treatment. Hb reached or exceeded its target range after 5-6 weeks. Because of this rapid response, 2 patients were started at a dose lower than the manufacturer's suggestive starting dose because their HB was borderline at referral.

No other side effects were reported. Patients or carers have found it easy to administer and are keen to continue on the medication. Blood monitoring can be a challenge, taking into account needle phobias, issues with arranging remote monitoring in primary care etc. We felt strongly however that we should closely monitor patients' blood values after commencement of Roxadustat, as well as reviewing our patients at anaemia clinics regularly.

Our results have shown that, with careful patient selection, the HIF inhibitor Roxadustat would seem to be an effective, safe and easy to use anaemia treatment for our renal population.

Poster number: 123

Submission number: 246

Medication adherence in older kidney transplant recipients – experience from the Kidney Transplantation in Older People (KTOP) study.

<u>D Amarpreet Thind</u>[1], Dawn Goodall[2], Dr Michelle Willicombe[3,2], Professor Edwina Brown[2]

[1]Department of Immunology and Inflammation, Imperial College London. [2]Imperial College Renal and Transplant Centre, Imperial College Healthcare NHS Trust. [3]Centre for Inflammatory Disease, Imperial College London

D Amarpreet Thind

Biography
Dr Amarpreet Thind is a Renal Registrar in North London and a recent Clinical Research Fellow at Imperial College London and the Imperial College Renal and Transplant Centre. Having graduated from Newcastle University in 2012 with an intercalated MRes degree, she is currently completing her PhD in geriatric nephrology. She is part of a multi-disciplinary team conducting the Kidney Transplantation in Older People (KTOP) clinical study

Abstract

Introduction: Medication regimens following kidney transplantation (KT) are often complex. Older people may have difficulty adjusting to these changes, especially as they are vulnerable to frailty and cognitive impairment. Support from pharmacy teams is important to managing this transition, and exploring existing adherence behaviours and attitudes can facilitate this further.

The Kidney Transplantation in Older People (KTOP): impact of frailty on outcomes study is a single centre, longitudinal study of older people's waitlist and KT experiences. This work presents the results from the medication adherence aspects of the study.

Methods: The KTOP study recruited older people (aged ³60) activated to the KT waitlist. Questionnaires assessing frailty, cognition, attitudes towards medication (Beliefs About Medication Questionnaire - BAMQ), and adherence to immunosuppression (Basel Assessment of Adherence to Immunosuppressive Medication Scale – BAASIS) were completed. The BAASIS was used as a single assessment of adherence to immunosuppression medication only. A BAMQ score of £47 was used to suggest participants held positive beliefs towards their medications. Descriptive and comparative statistics were used to describe adherence at 3- and 12-months following KT, variation with frailty and cognitive status, and associations with transplant outcomes (rejection and graft loss).

Results: 210 participants were recruited, 120 of whom were transplanted. 103 and 79 BAASIS were available at 3- and 12-months following KT respectively. Adherence within the cohort was similar at both timepoints (67% at 3 months, 65.8% at 12 months). At 3 months there was no association between adherence and recipients' beliefs, however at 12-months a higher proportion of the adherent recipients held negative beliefs (82.9%) compared to the non-adherent group (48.1%, p=0.04) (table 1).

At 3-months post-KT there was no difference in the proportions of KT recipients that were vulnerable/frail or had cognitive impairment in the adherent or non-adherent groups (table 1). At 12-months post-KT a slightly higher proportion of the non-adherent group were vulnerable/frail (42.3% compared to 38%) and had cognitive impairment (26.9% compared to 16.3%), however this was not statistically significant (table 1).

During the study period 33 participants experienced an adverse transplant outcome (graft loss 6, rejection episode 27). There was no difference in the occurrence of adverse transplant events between adherent (35.4%) and non-adherent participants (25%) (p=0.28), or those with positive (43.8%) and negative (56.2%) beliefs (p=0.72) when using the assessments available at the time of the event occurring (table 1).

Conclusion: The KTOP study identified that a third of older people were non-adherent with immunosuppression following KT, which was irrespective of their beliefs towards medications. In the early post-KT period, the presence of frailty or cognitive impairment did not seem to affect this, however this may be having a greater influence later. A predominance of negative beliefs in the adherent group was identified and may reflect the efforts of pharmacy teams to encourage adherence despite participants' underlying attitudes towards medications. The KTOP study was powered for assessing quality of life differences, but these data highlight that achieving a holistic understanding in this cohort can improve outcomes.

Table 1. Differences between adherent and non-adherent older transplant recipients.

	Adherent	Non-adherent	p value
3-months post-KT	69 (67)	34 (33)	
BAMQ positive beliefs	30 (44.1)	13 (39.4)	0.65
BAMQ negative beliefs	38 (55.9)	20 (60.6)	
Not frail	36 (52.9)	19 (57.6)	0.66
Vulnerable/frail	32 (47.1)	14 (42.4)	
No cognitive impairment	38 (62.3)	25 (78.1)	0.12
Cognitive impairment	23 (37.7)	7 (21.9)	
12-months post KT	52 (65.8)	27 (34.2)	
BAMQ positive beliefs	15 (17.1)	14 (51.9)	0.04
BAMQ negative beliefs	73 (82.9)	13 (48.1)	
Not frail	31 (62)	15 (57.7)	0.72
Vulnerable/frail	19 (38)	11 (42.3)	
No cognitive impairment	36 (83.7)	19 (73.1)	0.29
Cognitive impairment	7 (16.3)	7 (26.9)	

Data presented as n (%). KT – kidney transplantation, BAMQ – beliefs about medications questionnaire.

Poster number: 124

Submission number: 310

Medication review interventions for adults living with advanced chronic kidney disease: a scoping review.

<u>Mrs Cathy Pogson</u>[1], Dr Jignesh Patel[2,3], Dr Rosalynn Austin[4,5,6], Professor David Wheeler[7]

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Mrs Cathy Pogson

Biography

I am an experienced senior renal specialist clinical pharmacist currently undertaking an NIHR Pre-Doctoral Clinical Academic fellowship. This award is facilitating the development of my research skills to find solutions to problems I encounter in clinical practice. I am investigating polypharmacy for people living with advanced chronic kidney disease. Prior studies describe how hyper-polypharmacy, (15 or more regular medicines/day), decreases quality of life (QoL) for people receiving dialysis and supports my concerns, informed through numerous discussions with patients that this is an important problem. National renal clinical pharmacists' colleagues echo this experience. During my 29-years as a clinical pharmacist, the last 9-years at Wessex Kidney Centre (WKC), I have been involved with many research studies and have received research funding (research initiation award ARC-Wessex 2022). This has given me the opportunity to complete 3 MSc. modules: advanced quantitative analysis, advanced qualitative analysis, and research-methods, PPI training and to conduct literature reviews. I presented results of preliminary findings at Kidney Research UK Conference Nov-22 (poster). I have also published two peer-reviewed papers and held national clinical leadership roles at National Institute for Health and Care Excellence, the UK Kidney Association, and the Renal Pharmacy Group.

Abstract

Introduction

Medication burden is recognised as significant for people with advanced chronic kidney disease (CKD 4-5D). People living with CKD 4-5D, often live with multiple health-conditions, see many medical-specialists, and are prescribed multiple medicines. A structured medication review intervention is recommended by the National Institute for Health and Care Excellence for people receiving four or more different medicines per day (polypharmacy) as an effective strategy to reduce polypharmacy and

associated harms. This scoping review assesses the published extent and nature of structured medication review interventions for people with CKD 4-5D.

Methods

A search strategy was developed and executed in 4 databases (Medline, Embase, CINAHL, Cochrane) on 19th-20th October 2023 to identify studies with a medicine review intervention as a primary outcome, addressing polypharmacy for CKD 4-5D in any clinical setting. Randomised and non-randomized controlled trials, observational and quality improvement studies were included. Reviews, conference abstracts and studies including people with CKD stage 1-3, or with acute kidney injury were excluded.

Titles and abstracts were reviewed by two authors independently. Full text papers were obtained for eligible articles, data was extracted manually into a structured, iteratively designed Excel data-charting template, and analysed.

Results

From 1,877,520 records screened, 526 full texts were reviewed, and 13 papers were included in the final review. Most published work has been since 2020.

Investigators in six countries have conducted studies, Canada, USA, Australia, India, New Zealand, and Norway, none in multiple countries, none in the UK.

Study design includes one RCT, one non-randomised quasi study, three cohort studies, three prospective case-series, one prospective cross-sectional study, two Lynn-consensus validations, two qualitative studies.

The investigators approach polypharmacy in different ways. Those from Canada and Australia focus on deprescribing targeted medicines. Others from USA, Norway, and New Zealand had a holistic medication review approach, highlighting omitted and/or unnecessary medicines. In Norway, using the STOPP/START medicine review tool.

Of all studies, reviewed, 9 were intervention studies, with 7 studies assessing an intervention by a renal pharmacist.

Outcome measurements were categorised into patient-related clinically relevant, medication-related, patient-reported, or qualitative. Four clinically relevant outcome themes were identified, all-cause hospitalisation, 30-day readmission rates, duration of stay if hospitalised, and adverse effects.

Qualitative studies revealed many barriers towards optimising medicines. Notably, a lack of empowerment is driven by poorly defined boundaries for the management of comorbid patients, and limited knowledge about which medicines are potentially inappropriate and suitable to deprescribe.

Discussion

Many patients living with CKD 4-5D patients also live with other comorbidities and experience polypharmacy. However, no studies have investigated a medication review intervention to match the

complexity of kidney-care treatment offered to patients. The benefits and harms from medicines are not the same for patients who choose conservative care as for those receiving dialysis, or those who have received or are waiting for a renal transplant.

In my future research, I hope to improve our understanding of how to optimise medicines for people with CKD 4-5D. I will investigate the range of medicines prescribed, and the probable clinical efficacy and applicability of trial data to individuals. For CKD 4-5D choosing conservative care, treatment should be prioritised to symptom control, not on long-term prevention.

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Poster number: 125

Submission number: 313

Do pharmacist interventions improve outcomes in chronic kidney disease? Results from a systematic review and meta-analysis of randomised controlled trials

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Mr Ashkon Ardavani

Biography
I am a final year NIHR-ARC EM PhD student at the University of Leicester and a GPhC-registered pharmacist. My PhD is investigating the role of pharmacists in managing people living with chronic kidney disease.

Abstract

Introduction: Pharmacists are well-placed across primary, secondary, and community care with their clinical knowledge and expertise to manage people with chronic kidney disease (CKD). Clinical interventions delivered by pharmacists are highly varied and include managing comorbidities, medication review, and prescribing. Currently, data is limited regarding the impact of pharmacist interventions on clinical, economic, and humanistic outcomes. Improving the evidence around the role of the pharmacist will help support their use in CKD care and management. A systematic review and meta-analysis were conducted to establish the impact of pharmacist interventions on clinical, economic, and humanistic outcomes in CKD, and identify the structures and processes of effective interventions.

Methods: Randomised controlled trials (RCTs) of interventions with significant pharmacist input in a CKD population were included. The following databases were searched until February 2023: MEDLINE, Scopus, and Web of Science. Data was extracted pertaining to clinical (e.g., mortality), economic (e.g., healthcare-associated costs), and humanistic (e.g., patient satisfaction) outcomes. Where there were appropriate comparable outcomes, data were pooled using a meta-analysis to generate a pooled estimate of effect, using a random-effects model. A direction of effect plot was used to summarise the overall direction of effect for clinical outcome domains.

Results: 32 RCTs with 32,917 participants were included. Half (n = 16/32 (50%)) of studies were conducted in the United States, whilst one was conducted in the United Kingdom. Pharmacists delivered various interventions, with the most common being patient counselling (n = 14/32 (44%)) and patient education (n = 12/32, (38%)). Studies reported a total of 211 clinical, 10 economic, and 18 humanistic outcomes. Where appropriate, six outcomes were meta-analysed, in which pharmacist interventions resulted in statistically significant reduction in systolic blood pressure (-6.82 mmHg, 95% CI -9.06 to -4.58, $p < 0.00001$; $I^2 = 30\%$) (Figure 1A) and an increase in haemoglobin levels (0.76 g/dL, 95% CI 0.47 to

1.05, p < 0.00001; I^2 = 0%) (Figure 1B). No statistically significant differences were reported for diastolic blood pressure, eGFR, creatinine, and LDL cholesterol levels between groups.

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Mean difference IV, Random, 95% CI
Al Hamarneh 2018	127.7	15.2	147	136.7	19.4	143	16.9%	-9.00 [-13.02 , -4.98]
Chisholm 2002	145.3	16.8	13	175.8	33.9	10	0.9%	-30.50 [-53.41 , -7.59]
Mateti (Academic hospital) 2018	155.7	7.6	42	160.2	7.1	41	21.4%	-4.50 [-7.66 , -1.34]
Mateti (Corporate hospital) 2018	152.8	6.9	27	162.2	5.3	25	20.4%	-9.40 [-12.73 , -6.07]
Mateti (Government hospital) 2018	160	5.8	9	164	7.4	9	9.8%	-4.00 [-10.14 , 2.14]
Okoro 2022	135.9	17.8	73	140	24.9	74	8.0%	-4.10 [-11.09 , 2.89]
Qudah 2016	137.1	9.4	27	148.4	21.4	25	5.2%	-11.30 [-20.41 , -2.19]
Rifkin 2013	136	15.6	28	140	14.4	15	5.0%	-4.00 [-13.30 , 5.30]
Santschi 2011	135.1	22.2	48	141.8	23.7	41	4.7%	-6.70 [-16.30 , 2.90]
Tuttle 2018	133	21	66	137	21	63	7.6%	-4.00 [-11.25 , 3.25]
Total (95% CI)			**480**			**446**	**100.0%**	**-6.82 [-9.06 , -4.58]**

Heterogeneity: Tau² = 3.50; Chi² = 12.86, df = 9 (P = 0.17); I² = 30%
Test for overall effect: Z = 5.97 (P < 0.00001)
Test for subgroup differences: Not applicable

A) Systolic blood pressure

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Mean difference IV, Random, 95% CI
Alshogran 2022	10.5	1.1	57	9.8	1.3	57	42.2%	0.70 [0.26 , 1.14]
Marouf 2020	11.3	2.3	60	10	2.5	60	11.2%	1.30 [0.44 , 2.16]
Mateti (Academic hospital) 2018	9.8	1.5	42	9	1.5	41	19.8%	0.80 [0.15 , 1.45]
Mateti (Government hospital) 2018	8.4	0.6	9	7.8	0.6	9	26.8%	0.60 [0.05 , 1.15]
Total (95% CI)			**168**			**167**	**100.0%**	**0.76 [0.47 , 1.05]**

Heterogeneity: Tau² = 0.00; Chi² = 1.92, df = 3 (P = 0.59); I² = 0%
Test for overall effect: Z = 5.19 (P < 0.00001)
Test for subgroup differences: Not applicable

B) Haemoglobin

Figure 1 - Forest plots for A) Systolic blood pressure and B) Haemoglobin

No difference was reported between intervention and control groups for outcomes such as infection and mortality, whilst an overall positive effect was reported for several outcome domains, including smoking cessation and medication initiation in the intervention group. Mixed findings were reported for economic outcomes, whilst pharmacist interventions resulted in an improvement in humanistic outcomes such as patient satisfaction and patient knowledge.

Discussion: With pharmacists playing an increasingly important role in the management of CKD, these findings showed pharmacist interventions had mixed results for various outcomes. Positive changes in blood pressure and haemoglobin were likely a result of better pharmacological management from pharmacist involvement. However, the high heterogeneity in the outcomes and outcome measures used limits interpretation across studies and the development of a core outcome set may facilitate future research in the area. Future studies should be more robustly designed and take into consideration the role of the pharmacist in prescribing and deprescribing, the findings of which will help inform research and clinical practice.

Study Registration Number

The review was prospectively registered on PROSPERO (CRD42022304902).

Navigating iron therapy in chronic kidney disease - a 2024 perspective

Dr Sebastian Spencer[1,2], Dr Ben Oliveira[3], Dr Ashraf Mikhail[4], Mr Owain Brooks[4], Mr Gareth Bryant[5], Dr Michelle Willicombe[6], Dr Richard Baines[7], Mrs Louise Alldridge[8], Mrs Sally Haslam[9], Professor Sunil Bhandari[10]

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Dr Sebastian Spencer

Biography
Sebastian is an early career researcher with an academic interest in anaemia, peritoneal dialysis and earlier detection of CKD. He is currently an academic clinical fellow in renal medicine sponsored by the NIHR scheme and is based in Hull University Teaching Hospitals Trust.

Abstract

Introduction

This 2024 draft clinical practice guideline navigates the intricacies of iron therapy in the management of anaemia of Chronic Kidney Disease (CKD). Graded through the modified GRADE system, recommendations balance strength (strong or weak) and evidence levels (A-D). Endorsed by the UK Kidney Association, who will provide the platform for wider consultation before publication, it aligns with the NICE Guideline for anaemia management in CKD 2021.

Methods

Systematic literature searches (July 2016 to May 2023) across MEDLINE, PUBMED, Embase, and The Cochrane Library fuel evidence-based recommendations. Classifying the population by age—children (0–13 years), young people (14–17 years), and adults (18 years and over)—ensures targeted guidelines.

Results

Derived from prospective trials, controlled trials, meta-analyses, and Cochrane reviews, recommendations focus specifically on iron therapy. Consensus-based suggestions, rooted in committee expertise, augment evidence gaps, establishing a nuanced approach.

Discussion

Anaemia's impact on CKD is profound, influencing cardiac function, exercise capacity, and quality of life. Real-world insights from the 25th UK Renal Registry report (2021) underscore the prevalence, with over 20% of DD-CKD patients exhibiting Hb <90 g/L.

Guideline coverage delves into iron therapies, emphasizing the role in achieving and maintaining target Hb levels. It addresses initiation alongside ESA or HIF-PHi therapy, routes of administration, upper limits, and safety considerations. With Roxadustat as a licensed HIF-PHi formulation, the landscape of management of anaemia of CKD is evolving.

This focused poster consolidates the 2024 guidelines, serving as a guide for clinicians in the intricate realm of iron therapy for anaemia of CKD. By bringing together evidence-based recommendations, it offers a nuanced perspective, refining the approach to iron management in diverse CKD populations.

Poster number: 127 - WITHDRAWN

Poster number: 128

Submission number: 336

Vitamin D metabolism in end stage kidney failure: people receiving haemodialysis can still synthesise 1,25-dihydroxyvitamin D

Dr Sharon Huish[1,2], Professor Martin Hewison[3]

[1]Royal Devon University Healthcare NHS Foundation Trust, Exeter. [2]The University of Exeter, Exeter. [3]The University of Birmingham, Birmingham

Dr Sharon Huish

Biography
Sharon is Renal Dietetic Service Lead at Royal Devon University Healthcare NHS Foundation Trust and Honorary Senior Research Fellow at The University of Exeter. Sharon works clinically as an advance practice kidney dietitian and has a specialist interest in chronic kidney disease-mineral bone disorders (CKD-MBD). She currently chairs the UK CKD-MBD clinical study group and is co-lead of the UK calciphylaxis rare disease group. Sharon's research work focuses on the areas of calciphylaxis and vitamin D metabolism in CKD.

Abstract

Introduction

A large proportion of haemodialysed patients remain vitamin D deficient, contributing to the development, and severity, of chronic kidney disease-mineral bone disorder (CKD-MBD). This study aimed to investigate the effect of vitamin D (cholecalciferol) supplementation on serum levels of 25-hydroxyvitamin D_3, 1,25-dihydroxyvitamin D_3 and 24,25-dihydroxyvitamin D_3 in a group of people receiving haemodialysis.

Methods

Eighty-one haemodialysis patients (dialysis vintage ≥1 month) with low serum total 25(OH)D consented to participate. 40,000IU cholecalciferol was given weekly for 12-weeks followed by a maintenance dose of 20,000IU fortnightly (administered by dialysis nursing staff as part of routine care). Patients remained on active vitamin D (1,25$(OH)_2D_3$ and analogues) as part of routine care (clinician prescribed for management of calcium and PTH). Baseline and 12-month data were compared using related-samples Wilcoxon signed rank test (Table 1). NHS research ethics committee approval was received.

Results

Complete data were available and analysed for 55 patients. 1,25$(OH)_2D_3$ levels were low at baseline (48.3pmol/L, IQR 35.9-57.9pmol/L) despite 44 of 55 patients (80%) being prescribed an active vitamin D

analogue (normal range 60-120pmol/L). Cholecalciferol supplementation normalised both serum $25(OH)D_3$ and $1,25(OH)_2D_3$ and significantly increased $24,25(OH)_2D_3$ (Table 1).

Serum marker	Baseline	12 months	P-Value
$25(OH)D_3$ (nmol/L)	35.1 (23.0-47.5)	119.9 (99.5-143.3)	P <0.001
$1,25(OH)_2D_3$ (pmol/L)	48.3 (35.9-57.9)	96.2 (77.1-130.6)	P <0.001
$24,25(OH)_2D_3$ (nmol/L)	3.8 (2.3-6.0)	12.3 (9-16.4)	P <0.001
Corrected Ca (mmol/L)	2.38 (2.28-2.43)	2.41 (2.32-2.50)	P = 0.52

Table 1 Vitamin D metabolite and calcium results at baseline and 12 months (median and IQR).

Discussion

Synthesis of $1,25(OH)_2D_3$ is maintained (in kidney failure) but is substrate dependent, and low serum 25(OH)D was evident at baseline. $1,25(OH)_2D_3$ deficiency is therefore partly a consequence of 25(OH)D deficiency, rather than solely due to elevated FGF23 and reduced renal 1α-hydroxylase activity (which is shown to be present in kidney failure). Cholecalciferol supplementation increases the inactive substrate $25(OH)D_3$ rather than directly increasing $1,25(OH)_2D_3$. Increases in $25(OH)D_3$ and $24,25(OH)_2D_3$ are disproportionate to $1,25(OH)_2D_3$ increases, demonstrating the known tight regulation of $1,25(OH)_2D_3$ synthesis and secretion (in response to calcium and parathyroid hormone). Conventional oral vitamin D supplementation may provide a cheap and safe strategy for the management of vitamin D homeostasis in chronic kidney disease.

Poster number: 129

Submission number: 104

Can our patients on dialysis meeting the protein targets suggested by the UKKA 2019 and KDOQI 2020 guidelines?

<u>Mr Bruno Mafrici</u>, Mrs Sarah Sidani, Mrs Natalie Wilcox, Miss Ravinder Sagoo, Mrs Vigil Moyo, Miss Meghan Borg, Mr Oscar Walton, Dr Charlotte Bebb

Nottingham University Hospitals NHS trust, Nottingham

Mr Bruno Mafrici

Biography
Bruno is a renal dietitian working at the renal & transplant Unit at Nottingham University Hospitals NHS Trust. He is currently working as a renal dietitian non medical prescribers and he recently started his PhD with the University of Nottingham and Kidney Research UK. Bruno teaches at national lever to over 10 UK university to both undergraduate and postgraduate student and he is the authors and editor of the Pocket Guide to Clinical Nutrition. Bruno was the chair of the UK Renal Nutrition Group (2018-2022) and he continues to be involved with the UKKA.

Abstract

Introduction. Protein recommendation for patients on maintenance haemodialysis (MHD) and peritoneal dialysis (PD) have not changed over the past 20 years. The KDOQI 2020[1] guidelines suggest a protein intake of 1.0-1.2g/kg/body weight (BW)/ day for both HD and PD. The UKKA[2] recommendations for patients who are on HD are 1.1-1.4g/kg/ BW/day and for PD are 1.0-1.2g/kg/BW/day. There is evidence that over 50% of patients on dialysis struggles to meet these targets [3,4]. The aim of this audit was to compare dialysis patients estimated daily protein intake against protein targets from the UKKA 2019 and KDOQI 2020 guidelines

Method. Estimated protein intake was obtained via food diary for three days. We analysed the food diary using Diet plan®software. For patients on MHD this included at least one MHD day and one non-HD day. Patients were asked if they wanted to participate in this audit (n = 15 MHD, n = 15 PD). Inclusion criteria included age over 18years old, not acutely unwell, no hospital admission for the past 6 months.

Results. Only 6 MHD and 3 PD patients completed the 3 days food diary. Table 1 shows the estimated mean protein (in gram) intake compared to the guideline's targets. 5 out of 9 patients met the UKKA protein targets and 7 out of 9 met the KDOQI target. 2 did not meet either target with protein intake less than 1g/kg/BW/day. None of these patients were vegetarian or vegan. One patient was malnourished (score 2 of the 7 points renal Subjective global assessment).

Dialysis	Age	Weight (kg)	Estimated Mean intake (g)	Estimated intake per kg/BW	UKKA 2019 Targets	KDOQI 2020 Target	Target met?
MHD	54	94kg*	83.4g	1.05g	88-112g	80-96	No UKKA Yes KDOQI
MHD	72	76kg	98.6g	1.3g	83.6-86.9g	76-91.2	Yes
MHD	68	62kg	79.9g	1.29g	68.2-86.9g	62-74.4g	Yes
MHD	77	88kg	81.1g	0.92g	96.8-123.2g	88-105g	No
MHD	61	83kg	84.9g	1.03g	83-99.6g	84.9g	No UKKA Yes KDOQI
MHD	64	51.5kg	72.6g	1.4g	56.6-77.7g	51.5-61.8g	Yes
PD	25	55kg	108g	1.96g	55-66g	55-66g	Yes
PD**	65	68kg	61.6g	0.91g	68-81.6g	68-81.6g	No
PD	75	116kg*	95.2g	1.12g	85-102g	85-102g	Yes

* In obese individual, ideal body weight was used instead of actual body weight

** individual was malnourished hence

Discussion Although this was small sample, not all patients routinely met their targets for protein requirements for dialysis, accordingly to the UKKA and KDOQI guidelines. While meeting these targets has been associated with an increase in survival, there is a lack of interventional research, which measures a direct cause and effect relationship on mortality.

Many patients refused to complete a food diary because they reported they did not have time, therefore quicker and different approach should be considered in further audit/research when trying to estimate nutrient intake, including the use of technology (i.e. pictures).

Protein requirements are not routinely met by all patients on dialysis and should be part of a regular assessment in practice. More research is needed to establish the clinical relevance of meeting protein intake in patients on dialysis and how to implement this monitoring in routine practice.

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Poster number: 130

Submission number: 182

Recruitment barriers to professional committee roles – the perspectives of UK kidney dietitians (a Renal Nutrition Group survey)

<u>Mrs Angeline Taylor</u>[1], <u>Dr Sharon Huish</u>[2]

[1]Renal Nutrition Group (RNG) Chair, UK. [2]UK CKD-MBD clinical study group chair, UK

Mrs Angeline Taylor

Biography
Angeline Taylor has been a registered dietitian for 15 years and worked within the kidney specialty for the past 12 years. Currently, Angeline holds the position of Renal Dietitian Team Lead in the NHS, Chair of the British Dietetic Association Renal Nutrition Group (RNG), and Renal Dietitian for Kidney Care UK's Kidney Kitchen. She also sits on the UK Kidney Association Sustainability committee and the UKKA and Kidney Care UK Information committee. She is extremely passionate and committed to supporting those with kidney conditions to live a healthy lifestyle, and advocates a plant-based approach to managing kidney disease. Angeline see patients with a variety of kidney conditions and at various stages of the disease, from early to advanced stages of chronic kidney disease, dialysis, kidney transplantation, as well as acute illness on a busy NHS ward.

Abstract

<u>Introduction</u>

The success of the Renal Nutrition Group (RNG), much like the UK Kidney Association and affiliated groups, depends on the goodwill of professional committee members. Recruitment into RNG committee roles has been challenging in recent years; this has increased the workload burden on the existing committee. To help improve recruitment and protect its future; the RNG sought to gain information (from all their members) to better understand the challenges around recruitment.

<u>Methods</u>

An anonymised survey was designed to capture i) Why dietitians have not nominated themselves for committee positions ii) If dietitians feel specialist interest group (and national level) roles are valued and/or promoted by department leads iii) What would incentivise dietitians to become committee members and iv) Suggestions to help recruitment. The survey was distributed to all 434 RNG members by email in August 2023.

<u>Results</u>

63 responses were received giving a 15% participation rate. All 63 respondents completed the survey in full, and 15 of 63 (4%) provided additional free-text comments.

The survey results revealed the primary obstacle to committee participation was a lack of time, with additional reasons including insufficient experience and limited information on the time commitments.

Regarding the perceived value of specialist interest group roles, 44 of 63 (70%) respondents believed their department leads would appreciate such roles, while only 6 of 63 (1%) disagreed; the remaining 13 of 63 (21%) were uncertain. Encouragement from dietetic leads to engage in specialist groups was reported by 34 of 63 (54%) respondents.

Concerning incentives for committee membership, participants considered protected time during working hours the most significant motivator, followed by training, support, and mentoring.

Suggestions for recruitment improvement included increased transparency regarding time commitments, protected time within working hours, mentoring, training and support initiatives.

Discussion

Professional committee roles are voluntary; they depend on good will, dedicated, and enthusiastic people. In a healthcare climate, with increasing fiscal pressures, people are having to prioritise their time and effort. Better awareness is needed on the benefits of committee roles which include development of leadership, project management skills, national networking and increased career development opportunities.

Moreover, there is a necessity for appreciation, and increased support locally. Local leads can actively encourage team members to participate in specialist groups. Additionally, recognising the benefits of protected time is crucial for fostering participation.

The survey also indicated that health professionals' value clear information on time commitments, meeting formats, experience required, and the accessibility of mentors/ support. This emphasises the importance of offering detailed insights to potential volunteers, addressing their concerns, and facilitating decision-making regarding their engagement in voluntary roles.

As a result of this survey, a comprehensive FAQ document was developed by the RNG, which specifically addressed the challenges identified by respondents. This document also included guidance on involving department leads, and negotiating protected time. Subsequently, the document was distributed to all RNG members through email and made accessible on the RNG webpage under the committee section.   At the time of writing, the RNG has a full complement of committee members.

Poster number: 131

Submission number: 145

Does dietary phosphorus intake differ between dialysis and non-dialysis days? Using multiple pass methodology to provide the answer.

Mrs Joanne Beer[1], Dr Kelly Lambert[2], Dr Wai Lim[1], Professor Neil Boudville[1,3]

[1]Sir Charles Gairdner Hospital, Perth, WA. [2]University of Wollongong, Wollongong, NSW. [3]University of Western Australia, Perth, WA

Mrs Joanne Beer

Biography

Jo Beer is an advanced accredited practicing dietitian and diabetes educator who has been specialising in renal disease for the last 14 years. She divides her time between working clinically at Sir Charles Gairdner Hospital in Perth WA as well as private practice and research. She is currently working on her PhD in renal dietetics which is looking into the use of telehealth (via a smartphone App) in the management of serum phosphate in patients on maintenance dialysis. Part of the research involves a randomised controlled trial (The Telekinesis Study) which has just commenced and is taking part in 22 health sites across Australia. She is hoping to report back on initial findings later in the year.

Abstract

Introduction

Hyperphosphatemia in patients with kidney failure is common and associated with increased morbidity and mortality [1]. Unfortunately, management remains a signficant challenge [2], and requires a thorough dietary evaluation to determine the extent of dietary restriction required. However, for people undertaking haemodialysis, dietary intake is known to vary between dialysis and non dialysis days. It is unclear whether these variations result in significant differences in nutrient intake. The aim of this study was to determine agreement between dialysis and non-dialysis days for dietary phosphorus through repeated diet histories using multiple pass methodology.

Materials and Methods

Forty six participants (66% male, age 70 ± 13.3 years) with kidney failure undertaking dialysis at four Western Australian dialysis sites completed another study validating a new phosphate food frequency questionnaire[3]. This included three diet histories using multiple pass methodology which were obtained by a trained renal dietitian. The diet histories included a dialysis day, a non-dialysis weekday and a non-dialysis weekend day. Nutrient analysis was conducted using the Australian specific nutrient analysis program FoodWorks V.10 (Xyris Software [Australia] Pty Ltd). To reduce misreporting, individuals with daily energy intake of less than 500 kcal or more than 3500 kcal were excluded from the analysis [4]. For this study, the intra-class correlation and Kendall's tau_b were performed to assess and compare dietary

phosphorus intake on dialysis and non-dialysis days. Data were analysed using IBM SPSS version 26.0 (Armonk, NY).

Results

There was no significant difference in dietary phosphorus intake between dialysis and non-dialysis days (mean intake dialysis day was 1255mg ± 465mg; mean intake non-dialysis day 1324mg ± 406mg, P=0.217) (Table 1). This was also the case for dietary energy, protein, fibre, and sodium. Potassium intake differed between dialysis and non-dialysis days (dialysis day mean intake 2191± 813 vs non-dialysis day mean intake 2478 ±779, p=0.036).

The intraclass correlation coefficients indicated all nutrients showed consistency and absolute agreement between dialysis and non-dialysis days. Interpretation criteria confirmed good reliability for phosphorus, energy and fibre (0.76, 0.86 and 0.86 respectively) and moderate reliability for protein, sodium and potassium (0.67, 0.65 and 0.51 respectively). (Table 2).

Discussion

In this study, we determined that dietary phosphorus intake in people undertaking hemodialysis did not differ between dialysis and non-dialysis days. Despite previous studies[5, 6], and concerns that dietary intake differs, most nutrients did not vary except for dietary potassium.

The small sample size and limited geographic location of participants limits the generalisability of findings. Whilst the use of trained renal dietitians to conduct the multiple pass methodology diet histories reduced variability, ideally, a weighed food record would be used as a reference standard for validation [7]. However, its impracticality for dialysis patients made it unfeasible.

To our knowledge this is the first study to demonstrate that assessment of dietary phosphorus intake can occur on any day and combined with dietitian support provides reliable information for the development of targeted interventions to optimise phosphate management in dialysis patients.

Table 1. Descriptive statistics of dietary intake of dialysis and non-dialysis days according to 24-hour multiple pass methodology.

	Dialysis Day Mean ± SD	Non-Dialysis Day Mean ± SD	p-Value	r-Value	p-Value
Energy (kJ)	7387 ± 2358	7689 ± 2380	0.217	0.761	0.001
Protein (g)	83 ± 31	86 ± 27	0.475	0.535	0.001
Fibre (g)	19 ± 9	20 ± 8	0.208	0.764	0.001
Sodium (mg)	2171 ± 838	2231 ± 1036	0.673	0.448	0.001
Potassium (mg)	2191 ± 813	2478 ± 779	0.036	0.359	0.140
Phosphorus (mg)	1255 ± 446	1324 ± 406	0.217	0.622	0.001

Table 2. Intraclass correlation coefficient and Kendall's tau b of dialysis and non-dialysis days according to 24-hour multiple pass methodology

	Intraclass Correlation*	95% Confidence Interval	p-Value	Kendall's tau_b Correlation
Energy (kJ)	0.863	0.753 − 0.924	0.001	0.559
Protein (g)	0.696	0.451 − 0.832	0.001	0.359
Fibre (g)	0.864	0.755 − 0.924	0.001	0.634
Sodium (mg)	0.650	0.364 − 0.807	0.001	0.325
Potassium (mg)	0.509	0.135 − 0.724	0.007	0.264
Phosphorus (mg)	0.763	0.574 − 0.868	0.001	0.387

*Interpretation criteria for ICC 0.50 − 0.75 = moderate reliability, 0.75− 0.90 good reliability.

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Poster number: 132

Submission number: 115

Are renal dietitians working in one tertiary centre seeing new to dialysis patients within the national guidelines set out by the UK Kidney Association?

Miss Amy Altenberg, Miss Camille Harrison, Miss Madeleine Dixon

University Hospitals Sussex, Brighton

Miss Amy Altenberg

Biography
Amy is one of the senior renal dietitians working at the Sussex Kidney Unit and is Events Officer for the Renal Nutrition Group of the BDA. She has a BSc in Nutrition and Dietetics from the University of Surrey.

Abstract

Introduction

The UK Kidney association (previously renal association) guidance sets out that specialist renal dietitians should be seeing patients within one month of commencing dialysis. This audit set out to explore whether dietitians in one tertiary centre were seeing patients that had newly started on hospital haemodialysis within this time frame.

Methods

Data was collected over a 6 month period from May 2022 to November 2022. For each patient commencing dialysis information would be recorded on starting date, if they had been referred by haemodialysis staff, and when they were first seen by a dietitian. In retrospect we added data such as which dietitian saw them at their second appointment and if they had subsequently moved to a satellite unit for dialysis. Over this time frame we collected data for 39 patients.

Results

Time taken for dietitians to identify a new to dialysis patient was on average 7 days.

40% (16 of 39) of the patients identified were formally referred with 60% (23 of 39) being picked up solely through the dietitians weekly screening for patients newly starting dialysis.

The average time taken from identifying a patient to them having an appointment with a dietitian was 28 days. 56% (22 of 39) were seen within 4 weeks of commencing HD and for 44% (18 of 39) it took more than 4 weeks for them to be seen by a dietitian, up to a maximum of 65 days.

Factors which impacted patients being seen within the 4-week period included repeat inpatient admissions, delays as patients moved out to satellite units and pressures in staffing.

For the 39 patients audited 42% (16 of 39) had their first 2 contacts with the same clinician whereas 58% (22 of 39) did not, 1 patient passed away prior to a follow up appointment.

Discussion

All patients who are new to dialysis are being seen by a specialist renal dietitian. However, their first appointment is not always falling in the recommended time frame of one month from commencing dialysis. The data collected also includes those that have started dialysis whilst an inpatient and had an appointment scheduled upon discharge.

Of note when considering the results is that 60% of patients were not formally referred to the dietetic team. This indicates the effectiveness of dietetic screening for patients that are new to dialysis however cannot indicate to us whether any patients are being missed in this process. It also raises questions around this referral process and further audits could consider how many patients may be missed if our dietitians are not screening for patients each week.

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Poster number: 133

Submission number: 305

Exploring patient experience about eating out on a renal diet- Is there a need for more support?

Mrs Amita Godse[1], Mrs Ragnhildur Hoskuldsdottir[2]

[1]Newcastle Hospitals, Newcastle upon Tyne NHS trust, Newcastle upon Tyne. [2]Northumbria University, Newcastle upon Tyne

Mrs Amita Godse

Biography
Amita Godse is a registered dietitian working within the NHS as a renal dietician for the past 10 years. Along with her expertise in renal dietetics she also specialises as a diabetes dietitian. She is qualified as a supplementary prescriber. She is currently leading the development of dietetic service for post renal transplant diabetes management within her trust. Combining her passion for cooking with dietetic knowledge, she is enjoying working for the Kidney care UK- as the Kidney Kitchen dietitian.

Abstract

Introduction: Most renal patients are required to limit their intake of salt, potassium and phosphate. This might limit patients' choices and may negatively impact their experiences while eating out.The purpose of this survey was to explore renal patients' attitudes towards eating out whilst on renal dietary restrictions and to identify if there is a need for kidney friendly options eg: modified dishes or improved food labelling on restaurant menus.

Method: A questionnaire was developed that comprised of 12 questions, 10 of which were multiple choice and the remaining 2 were open-ended. A total of 30 questionnaires were completed by pre-dialysis, haemodialysis, and post-transplant patients with help from the researcher if needed.

Results: 53% of patients reported that they follow renal dietary restrictions when dining out whilst 37% said only sometimes. 76% of patients agreed that it was difficult to find foods suitable to eat on a renal diet whilst eating out and just over half of them stated that this negatively impacted their experience and discouraged them from going out more often. 67% of patients agreed that they would choose to eat the dishes on the menu if they were labelled as lower in salt, potassium, and phosphate.

Discussion: Our survey results suggest that renal patients may struggle to choose appropriate meals when eating out that conform with renal dietary restrictions. There may therefore be a case for supporting restaurants in labelling dishes to aid customer choice. Patients are very likely to choose this option and that a lack of these options negatively impacts patient experiences. There is a potential to pilot a study where some food items on a restaurant menu could be modified to suit renal dietary restrictions eg: parboiled chips, no added salt dishes, puddings without chocolate. This will offer patients a wider choice while eating out on a renal diet. Modifying menus in restaurants could pose a challenge and may have its limitations. It is therefore also important that we empower patients to make right

choices while eating out on a renal diet. Modifying dietary education resources and directing patients to the appropriate online resources already available are some of the ways to help patients feel more confident whilst eating out on a renal diet.

Poster number: 134

Submission number: 305

Presence of potassium chloride in ultra-processed foods - how important is it to consider this when advising on a low potassium diet?

Mrs Elizabeth Rai[1], Miss Ragnhildur Hoskuldsdottir[2]

[1]Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne. [2]Northumbria University, Newcastle upon Tyne

Mrs Elizabeth Rai

Biography
The author has over 20 years' experience as a renal dietitian and is currently lead renal dietitian for adult services at Newcastle Hospitals working with patients as all stages of their treatment journey. She is a supplementary prescriber and member of the BDA Renal Nutrition Group. In her current role a member of the RNG patient resources sub group she contributes to the writing and updating of nationally available dietary information sheets for kidney patients.

Abstract

Introduction: A low potassium diet is routinely advised to aid the management and prevention of hyperkalaemia. Potassium chloride is used as alternative to salt in UK food manufacturing which although benefiting consumers with a reduction in sodium intake, may have consequences for those following a low potassium diet. Consumption of foods containing potassium chloride has been shown to significantly increase dietary potassium intake[1] and it has been reported that a high level of absorption is likely[2]. The aim of this study was to investigate the presence of potassium chloride in UK food products.

Methods: Food products were assessed by a process of online and in store supermarket research. Where more than one brand of a product existed, all were selected. Different varieties or flavours of products were also included. The presence of potassium chloride was identified from product labels and results were collated according to food type.

Results: A total of 539 products were assessed and potassium chloride identified in 40% of these. Of the products reviewed, the highest incidence of potassium chloride was observed in mini cracker biscuits and rice based snacks with 50% of products reviewed containing this additive. Potassium chloride was also found in 35% of packet soups and flavoured noodles, and 30% of maize, rice and wheat snacks and tortilla chips. Variation was found between different brands and product flavours. Potassium chloride was also noted in other ultra-processed foods such as gravy granules, stocks, powdered sauce mixes and chilled meat/cheese products but the incidence of this was <20% . Tinned products (vegetable, meat, fish) and popcorn were not found to contain this additive.

Discussion: Potassium chloride was found to be present in a variety of commonly eaten ultra-processed foods and may make a considerable contribution to the overall dietary potassium intake of some

individuals. The presence of such foods in the diet should therefore be considered when counselling patients on a low potassium diet. The products where the highest incidence of potassium chloride was observed are predominantly made from wheat or rice which is naturally low in potassium, these may previously have been deemed acceptable to eat on a low potassium diet. It was also observed that many of the food products identified are of limited nutritional value, typically low in protein, vitamins and minerals, suggesting that advising complete avoidance of these types of foods may be appropriate for some individuals. Patients should therefore be guided to alternative, less processed products but care should be taken not to compromise overall nutritional intake. For individuals with limited cooking and food preparation skills, complete avoidance of possible potassium chloride containing products may not be realistic and ongoing consumption may be necessary to support overall nutritional adequacy. Supporting patients with the avoidance of this food additive will require detailed dietetic assessment and guidance, and an ability and willingness from patients to check product ingredients lists. Diet sheets and written resources may require rewriting and updating.

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Case report: Dietetic management of a series of fourteen pregnant patients on haemodialysis

Mrs Rosalind Campbell

Manchester Royal Infirmary, Manchester

Mrs Rosalind Campbell

Biography
I have been a renal dietitian at Manchester Foundation Trust for nearly 20 years, with extensive direct patient experience in renal medicine and surgery. I manage patients dietetic care in advanced CKD clinics, dialysis units, medical and surgical wards, and am skilled in renal parenteral nutrition and encapsulating sclerosing peritonitis (EPS). As a supplementary prescriber I manage patients bone medications and parenteral nutrition, including intradialytic. I have previously presented and published work in EPS including the UK Kidney Association EPS guidelines, and renal-specific oral nutritional supplements. I have peer-reviewed journal articles for Peritoneal Dialysis International journal and abstracts for UK Kidney Week.

Abstract

Introduction

Pregnancies can experience nutritional deficit due to pregnancy-induced sickness, increased requirements, and digestive discomfort. Protein delivers nitrogen balance, muscle turnover, immunity and foetal growth. Micronutrients <RNI (reference nutrient intake) are common in females aged 20-40, particularly selenium and magnesium, (Derbyshire E. 2018), before CKD/HDs impact. Renal-induced inflammation, acidosis, uraemia, and hormonal imbalance, cause oxidative stress and anorexia. Increased HD number/length to maintain urea <15mmol/L as pregnancy develops, increases nutritional losses, and demands. Pregnant women on HD are therefore considerable risk for deficiency.

Methods

Retrospective analysis of clinical notes for our last fourteen pregnant patients on HD from hospital electronic records, 2019-2023.

Results

Dietetic consults commenced soon after starting hospital-HD. At conception, 5/14 were CKD, 4/14 transplanted, 3/14 hospital-HD, 1/14 hHDx and 1/14 with normal function/pre-AKI. Energy intake 30-40kcals/kg IBW (ideal body weight) (PENG 2018) + 300kcals/d from 12+/40 gestation was advised. Goal protein intake was 1.2-1.4g/kg IBW for baseline and increasing dialysis needs (PENG 2018), plus 10g/d

for pregnancy (National Research Council 1989) to 1.8g/kg IBW (Nakabayashi M et al 1999), increasing with HD hrs/wk, maternal weight gain and trimester. Renapro Shot (60mls, 100kcals, 20g protein) commenced if unable to take sufficient dietary protein. Omega-3 fats were encouraged; oily fish 2x/wk (340g/wk), or supplementation with ≥200mg/d docosahexaenoic acid, to support foetal brain development (Coletta JM et al 2010). NHS pregnancy food safety advice was given.

As HD increased, fluid intake liberalised. Interestingly, urine re-started in one previously anuric patient, perhaps from increased renal perfusion. Salt limitation was encouraged to avoid hypertension and oedema. Table 1 summarises nutritional biochemistry. Prolonged/intensive HD often allowed phosphate binder cessation, potassium/phosphate increase +/- HD-supplementation. Calcium for foetal skeleton calcification was provided through dialysate, dietary increase +/- calcium supplement. Vitamin D was monitored and supplemented with 800u cholecalciferol, which can be converted by the placenta, +/- alfacalcidol. Magnesium was monitored for depletion from increased HD and higher pregnancy dietary reference value (DRV) (Rayes-Lopez et al 2019), dietary sources advised where low. Water-soluble vitamin replacement escalated with HD, doubling Renavit/adding Renavit to pregnancy-specific multivitamin at 16hrs/wk, plus additional Renavit at >28hrs/wk HD. Vitamin A was measured for one patient on post-bariatric surgery Forceval. Folic acid 5mg/d commenced for preventing neural tube defects and high-risk pregnancy support. Zinc and selenium were monitored/increased in diet/supplemented to prevent foetal abnormalities.

Upper arm anthropometry and handgrip strength monitored protein status, given pregnancy-induced weight gains for 6/14 patients (table 2). Ultrasound scans communicated foetal well-being, motivating mothers' intakes if centiles were low. Pre-existing diabetes was present in 3/14 patients managed with insulin, avoiding hyperglycaemia and associated birth defects (Kothari M et al 2019). Live births were achieved in 12/14 patients at 24.5-36.5 weeks gestation.

Discussion:

Dietetic care supports nutritional needs of HD pregnancies and optimal foetal development and assists in identification and treatment of nutritional deficit. Nutrients prone to depletion were protein, phosphate, potassium, magnesium, selenium, and zinc. Upper arm anthropometry demonstrates fat and protein status to guide dietetic advice. Earlier dietetic advice to increase commonly depleted nutrients, would prepare women for HD-supported pregnancy and reduce/prevent depletion.

Table 1: Nutritional biochemistry

	Albumin <31g/L	Phosphate <0.8mmol/L	Phosphate >1.5 mmol/L	Potassium <4.0mmol/L	Potassium >5.5mmol/L	Magnesium <0.8mmol/L	Selenium <0.8µmol/L	Zinc <10µmol/L
No. pts	14/14	3/14	6/14	1/14	1/14	8/12 (2 untested)	4/4 (10 untested)	4/4 (10 untested)

Table 2: Anthropometric measurements

	Gestation	Handgrip strength (kg, centile range)	Mid-arm circumference (cm, centile range)	Triceps skinfold thickness (mm, centile range)	Mid-arm muscle circumference (cm, centile range)
Pt no.1	13/40	24.2 10-25th	31.5 50-75th	18 25-50th	25.8 75-85th
	20/40	28.9 25-50th	32.7 50-75th	20.3 25-50th	26.3 85th
	24/40	29.0 25-50th	30.0 50-75th	17.2 25-50th	24.6 75th
	29/40	30.7 50th	31.9 50-75th	14.8 15-25th	27.3 90th
Pt no.2	11/40	15.7 <10th	29.5 25-50th	14.8 10th	24.9 50-75th
	15/40	17.0 <10th	29.4 25-50th	18.8 25-50th	23.5 50-75th
	19/40	19.3 <10th	29.4 25-50th	20.3 25-50th	23.0 25-50th
	25/40	17.4 <10th	30.2 25-50th	17.0 15-25th	24.9 50-75th
Pt no.3	13/40	18.4 <10th	25.9 15-25th	11.8 10th	22.2 25-50th
Pt no.4	8/40	23.0 10th	35.5 75-85th	32.0 85-90th	25.5 75-85th
	15/40	19.4 <10th	34.0 50-75th	30.0 75-85th	24.6 75th
Pt no.5	11/40	17.2 <10th	28.5 25-50th	17.0 15-25th	23.2 50th
	19/40	21.4 <10th			
Pt no.6	14/40	24.8 20-25th			
	22/40	26.2 25th			
	25/40		30.0 50-75th	18.0 25-50th	24.3 50-75th

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Poster number: 136

Submission number: 387

Empowering simultaneous pancreas-kidney (SPK) transplant candidates for success – the role of the renal dietitian

Mrs Eimear Hamilton, Mrs Annika Baird, Mrs Gillian Walker

NHS Lothian, Edinburgh

Mrs Eimear Hamilton

Biography
Specialist Renal Dietitian based at the Royal Infirmary of Edinburgh to deliver the nutrition and dietetic service to the inpatients, outpatients and day patients within the Department of Renal Medicine and Transplant, throughout NHS Lothian. Provides nutritional care and management within the Edinburgh Transplant Centre for the National Simultaneous Kidney/Pancreas transplant programme, the East of Scotland Living Related Kidney Transplants, cadaveric transplants and non-heart beating donor transplants. Expertise and experience with complex nutritional care including within renal, paediatric, diabetes and surgical specialties.

Abstract

Introduction

To explore the integral role of renal dietitians in supporting SPK transplant candidates in a transplant pre-assessment clinic.

Background / Methods

SPK transplant candidates face significant diabetes and renal complications that can adversely impact their nutritional status pre and post transplantation. Additional funding, obtained in 2015, was used to provide dedicated specialist dietetic input to the SPK transplant pre-assessment clinic.

Results

Our experience with patients demonstrates the importance of individualised dietetic support, helping candidates work towards transplantation by refocusing and engaging with relevant specialties whether that is related to nutritional status, weight management or diabetes control.   Positive patient feedback also shows the valuable impact of dedicated specialist dietetic support. Patients report feeling overwhelmed with the management of their diabetes and kidney disease but tend to re-engage with local services after attending clinic. The wider MDT highly values dietetic input to the SPK service and pre-assessment clinic which has led to a marked increase in demand for new patient assessments at these clinics. As well as the potential to improve access to transplant, proactive pre-transplant

management of high-risk patients has resulted in a timelier resumption of oral intake and a reduced need for artificial nutritional support post-operatively.

<u>Discussion</u>

Our experience highlights the benefits of dietetic assessment and support to optimise nutritional status for SPK transplant candidates and reduce risks associated with this surgery. While dietetic interventions can be complex and time consuming, they play a vital role in transplant pre-assessment. Seeking additional funding and the establishment of an advanced practice dietitian for the transplant service is a crucial next step to be able to provide a more robust and enhanced service, addressing the rising demand for pre-operative dietetic input.

Poster number: 137

Submission number: 292

Class II PI3-kinase C2-β deficiency increases kidney injury and fibrosis in unilateral ureteral obstruction induced kidney disease.

Mr Julius Kieswich[1,2], Dr Samira Alliouachene[1,2], Professor Bart Vanhaesebroeck[3], Dr Goran Mohammad[1,2], Dr Abhishek Kumar[1,2], Mr Kieran McCafferty[1,2], Professor Christoph Thiemermann[1,2], Professor Muhammad Magdi Yaqoob[1,2]

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Dr Goran Mohammad

Biography

I completed my PhD in Biomedical Science at University College London in 2016 under supervision of Professor Stephen Pereira and Dr Dipok Dhar, where I investigated the role of metabolic enzymes in progression and development of pancreatic cancer, specifically I studied the PKM2 and LDH-A enzymes as a diagnostic marker and therapeutic target for pancreatic cancer. After PhD graduation, I joined prof. Lakhal-Littleton's group at department of Physiology, University of Oxford, as a Postdoctoral Research Assistant. Projects were focused on the role of hepcidin and ferroportin in the intracellular and extracellular iron homeostasis, and its effect on the human health. My project was focused on the study of the role of hepcidin/ferropertin axis in iron regulation in the heart, kidney, placenta, and vasculature, by utilising novel animal models of tissue-specific alterations in iron metabolism. Recently, I joined prof. Magdi Yaqoob's group at William Harvey Research Institute, Queen Mary University of London. Our group focusing on treatment and mechanism of chronic kidney disease (CKD) and how to stop the progression of CKD to kidney failure and fibrosis. I am currently focusing on the study of treatment and mechanism of kidney fibrosis both in animal model and human primary fibroblasts cell.

Abstract

Introduction

Chronic kidney disease (CKD) remains a major world health challenge and renal fibrosis is a key pathological contributor of the final demise of the kidney causing End Stage Renal Disease (ESRD). The molecular mechanisms involved in this pathology have not yet been fully elucidated however the role of Phosphoinositide 3-kinases (PI3Ks) signalling are gaining interest. PI3Ks exist in different isoforms classified as class I, II and III. They are involved in diverse physiological processes including glucose metabolism, insulin signalling, migration, proliferation, and apoptosis. Much is known about the function

of the Class I PI3Ks but this is not the case for the Class II and III isoforms particularly in the kidney. Harris et al. reported that Class II PI3K C2-α is involved in the preservation of healthy glomerular architecture and activity by maintaining normal podocyte function. However the role of the Class II PI3K C2-β isoform in the kidney has not been established. In this study we hypothesised that given the known function of PI3Ks C2-α in the kidney, PI3Ks C2-β may also have an involvement. To investigate this we subjected PI3K C2-β kinase-dead knock-in mice (a model which represents a pharmacological PI3K-C2-β inhibitor) to unilateral ureteral obstruction (UUO), an established model of renal fibrosis.

Methods

UUO was performed on male **PI3K C2-β** kinase-dead knock-in mice and wild-type. In all animals, the left kidney was ligated and the right non-ligated kidney was used as the control. Animals were culled 10 days after surgery and the blood and organs were harvested for serum biochemistry, histology, and protein analysis (by Western blot).

Results

As expected in this model, serum creatinine and urea were unchanged despite the ligated kidneys developing a substantial degree of fibrosis compared to the contralateral normal kidneys. However, the **PI3K C2-β** kinase-dead knock-in mice UUO kidneys showed a significantly higher level of fibrosis and injury compared to wild-type UUO kidneys (Hematoxylin and Eosin P< 0.02, Sirius red P< 0.01, Masson's trichrome P<0.05, and Periodic acid-Shiff P< 0.02). Western blots showed increased α-smooth muscle actin and vinculin (indicating fibrosis) and phospho AKT (indicating the fibrosis pathway mechanism), in the **PI3Kinase C2-β** kinase-dead knock-in mice compared to wild-type.

Discussion

These results highlight the importance of the **Class II PI3K C2-β isoform in kidney function and more specifically its role of conferring protection against renal fibrosis in the mouse.**

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Poster number: 138

Submission number: 367

Developing an in vitro model of the glomerulus using acoustic cell patterning.

Mr Alexander Doulah, Ms Martha Lavelle, Mr Sammy Shorthouse, Dr James Armstrong, Professor Gavin Welsh

Department of Translational Health Sciences, Bristol

Mr Alexander Doulah

Biography
I am currently in my 4th year of medical school at the University of Bristol. I completed an intercalated Masters degree in health science research between my 3rd and 4th years of study. For my intercalation I worked with the Armstrong group and Renal group at the Department of Translational Health Sciences in the University of Bristol to use acoustic patterning to develop a novel model of the glomerulus.

Abstract

Background: The kidney filters blood plasma to remove metabolic waste, exogenous toxins and regulate electrolyte levels (1). Filtration of plasma into the renal tract occurs across capillaries known as the glomeruli (2). 90% of all end stage renal disease cases are caused by damage to glomeruli (3). *In vivo* models can replicate glomerular disease processes but are not ideal for high-throughput screening when investigating therapeutics (4, 5). Current *in vitro* models are limited by either not forming a functional glomerular barrier or by not demonstrating mature glomerular cell characteristics (6). Therefore, to generate a novel *in vitro* model which could address all these limitations, we assessed using acoustic patterning to align glomerular endothelial cells (GenCs) and podocytes into cell bands. To ensure cells would remain in place, we investigated trapping them within a fibrin gel.

Methods: Fixed podocytes were acoustically patterned in fibrin gels containing varying thrombin and fibrinogen concentrations to optimise the patterning time and quality of band formation. Optimised conditions lead to acoustic patterning of live podocytes and GenCs in gels consisting of 6.25 mU/mL thrombin and 15 mg/mL fibrinogen. To prevent the degradation of the fibrin, gels were further crosslinked with 1U/ml thrombin and cultured in media containing 1 mg/mL aminocaproic acid. Differentiation of cells was triggered by switching the incubating temperature from 33°C to 37°C after 24 hours of incubation. After 96 hours, confocal images were taken of patterned gels. Wave analysis was performed on the confocal images to assess regularity and prominence of cell bands. Gene expression of specific podocyte cell protein (Podocin) and endothelial cell proteins (Pecam-1 and VE-cadherin) was assessed by quantitative PCR.

Results: After 96 hours, podocytes appeared to form central columns surrounded by GenCs (Figure 1). Upregulation of podocin was seen in cells cultured in gels compared to cells cultured on monolayers, however, this change was not statistically significant (Figure 2).   The mean gene expression for all proteins was also highest in the patterned gels.
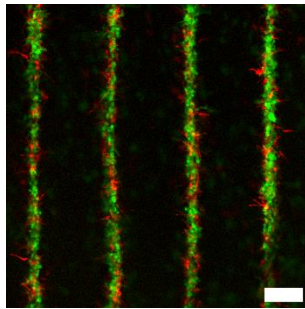
Fig 1. 96-hour patterned cells. Confocal imaging of a coculture of 200,000 podocytes (green) and 200,000 GenCs (red) grown in 800 µL fibrin gels after 96 hours. Patterned gel 10x magnification. 200 µm scale bar.
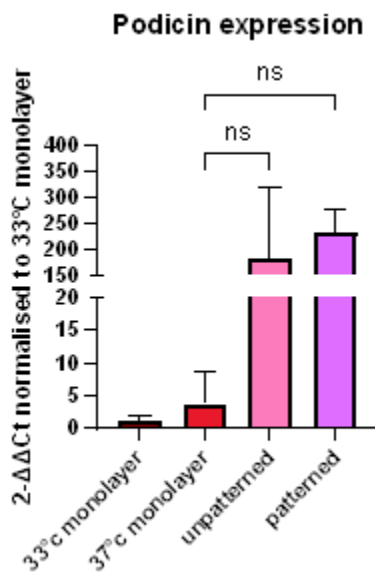
Fig.2 Expression comparison of Podocin in different cocultures. Gene expression was compared using the ΔΔCt method normalised to the 33°C monolayer. GAPDH housekeeping gene. No significant difference seen. N=3 samples per group. All data presented as the Mean ±SD. All data analysed using a Kruskal Wallis test with Dunn's test of multiple comparisons.

Discussion: We have successfully patterned glomerular cells into lines which persisted for 96 hours. The self-organisation seen in the patterned bands suggests that cross-talk between the podocytes and GenCs is occurring, showing that the cells are acting more akin to *in vivo* cells compared to traditional monolayer *in vitro* cultures. Overall, this paper demonstrates that acoustic patterning could be used to generate *in vitro* glomerular models suitable for research requiring high throughput screening or needing to measure glomerular filtration efficacy.

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Is FOXO1 mechanosensitive? The effect of rhythmic and static stretch on transcription activation within podocytes.

Miss Elizabeth Wood, Dr. Robert Pope, Dr. Gavin Welsh, Dr. Richard Coward

University of Bristol, Bristol

Miss Elizabeth Wood

Biography
Elizabeth wood is a medical student from Bristol university, currently intercalating in clinical sciences.

Abstract

Introduction

Podocytes are specialised epithelial cells that line the glomerulus in the kidney. They are known to be insulin sensitive. Insulin activates the Pi3K pathway, with the transcription factor FOXO1 being down-stream. Upon phosphorylation, FOXO1 is exported from the nucleus and into the cytoplasm where it regulates multiple physiological functions (1, 2).

Physiologically, the glomerulus and podocytes experience mechanical rhythmic stretch due to cardiac output, but this is not routinely studied. It is however known that podocytes are mechanosensitive (3).

This project explored rhythmic and static stretch-induced kinetics of FOXO1 in podocytes.

Methods

Using the Flexcell® FX-6000T™ Tension System, immortalised human podocytes overexpressing the insulin receptor (increasing their insulin-sensitivity) and FOXO1 fluorescently tagged with clover, were subjected to rhythmic mechanical stretch mimicking physiological norms. A frequency of 1 pulse/second (reflecting a 60bpm heart rate) at 8% elongation (as suggested by the literature to reflect the tensile stress podocytes in vivo experience (4, 5)) was performed.

Non-stretched control cells were cultured in the same plate or in separate plates adjacent to stretched cells. Cells were imaged using a light microscope and the location of FOXO1 was described observationally and using a novel scoring system.

Results

Nuclear localisation of FOXO1 was apparent within 1 hour of rhythmic stretch, as shown by figure 1. One hour of static stretch also resulted in nuclear FOXO1, entailing repression of transcriptional activity.

Using non-biased total and phospho-proteomics we assessed known FOXO1 regulated pathways and found several differences.

These novel observations suggest that FOXO1 is mechanosensitive in a dynamic regulation process.

Discussion

This work shows the fundamental importance of rhythmic stretch in podocyte biology and insulin signalling. Live imaging of stretching cells would allow the full kinetics to be resolved and is ongoing work.

Figure 1:

Figure 1 legend: Immortalised human podocytes expressing FOXO1 fluorescently tagged with clover. *Rhythmic stretch:* Before and after 1 hour of rhythmic stretch, with same-plate controls. *Static stretch:* Two example podocytes, with the nucleus stained red using SYTO™ red dye 59, from before and after 2 hours of static stretch.
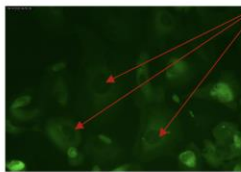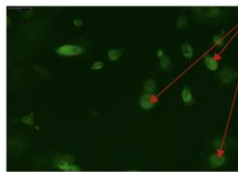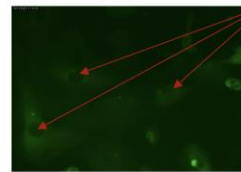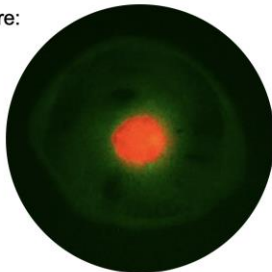
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Poster number: 140

Submission number: 418

Elucidating the function of novel Arg1+/Clec4d+ scar-associated monocyte-derived macrophage population in driving fibrosis in kidney disease models.

Dr Rachel Bell[1], Ms Paloma Paloma Ruiz Blázquez[2], Mr Ross Campbell[3], Dr Bryan Conway[1], Dr Cécile Bénézech[1], Dr Laura Denby[1]

[1]Centre for Cardiovascular Science, University of Edinburgh, Edinburgh. [2]Instituto de Investigaciones Biomédicas, Universitat de Barcelona, Barcelona. [3]Institute for Regeneration and Repair, University of Edinburgh, Edinburgh

Dr Rachel Bell

Biography
Recently completed PhD in the Denby Lab investigating the link between myeloid cells and renal fibrosis development in models of chronic kidney disease. Continuing work on this as a postdoctoral researcher.

Abstract

INTRODUCTION:

Fibrosis is the final common pathway in all progressive kidney disease. Macrophages are a major myeloid cell component of the renal mononuclear phagocyte system, with roles in defence against infection, renal injury, and repair. Using single-cell RNA sequencing, we identified a novel myeloid cell subset exclusively present in acute injury of the unilateral ureteric obstruction (UUO) model of kidney fibrosis. This population transcriptomically aligns to monocytes but is enriched for both *Arginase-1* (*Arg1*) and the *C-type lectin 4d* (*Clec4d)* and a large number of pro-inflammatory and pro-fibrotic genes. We hypothesise that this novel *Arg1+/Clec4d+* population contributes to fibrosis deposition in progressive kidney disease.

METHODS:

Monocyte-macrophage populations were characterised in different pre-clinical models; UUO, unilateral ischaemic reperfusion injury (uIRI) and subtotal nephrectomy with flow cytometry. Arg1/Clec4d+ cells were identified by flow cytometry, RT-qPCR and immunofluorescence. The origin and consequence of Arg1 deletion in monocytes on renal fibrosis was determined by utilising *Ccr2*-ER^{T2}-TdTomato and *Ccr2*-ER^{T2}-TdTomato; Arg1 $^{fl/fl}$ mice, respectively.

RESULTS:

The presence of the *Arg1+/Clec4d+* cells was validated in the UUO, unilateral ischaemic reperfusion injury (uIRI) and subtotal nephrectomy models of kidney injury. Analysis of intra-renal inflammation revealed CD45+CD11b+Arg1+ cells persisted and increased in number across 7 days. Post-injury, Arg1+ cells were confirmed to be Clec4d^{hi}. To confirm that Arg1+/Clec4d+ cells were derived from monocytes (Ccr2+), we

administered tamoxifen to Ccr2Cre[ERT2]-TdTomato mice under a single or multiple-dose regimen following UUO surgery. At day 7 post-injury, ~50% and ~90% of the Arg1^{+} cells were TdTomato[+] following a single or multiple doses of tamoxifen, respectively, suggesting that these cells are primarily monocyte derived. Moreover, the Arg1^{+}/Clec4d^{+} cells were found to localise to areas of scarring.To investigate the therapeutic potential of targeting Clec4d^{+} expressed on the Arg1^{+}/Clec4d^{+} macrophages, mice underwent UUO surgery and given multiple doses of a Clec4d-neutralising antibody. A decrease in *Arg1* and fibrosis-related gene expression was evident by day 7 post-injury.To understand the role of increased Arg1 expression in the cells we generated *Ccr2*-ER[T2]-TdTomato; Arg1 [fl/fl] mice. These mice had as expected a reduced Arg1 expression in the Ccr2^{+} population and metabolic profiling by SCENITH of the tissue monocytes revealed that the loss of Arg1 in the cells reduced their glucose dependence. The loss of Arg1 in these cells reduced Kim-1 gene expression in the kidney.

CONCLUSION:

As fibrosis is a pathological process that can affect any organ, the work included here, in addition to the proposed future studies, has the potential to develop novel therapeutics that limit fibrosis and enhance repair to halt the progression of disease in CKD.
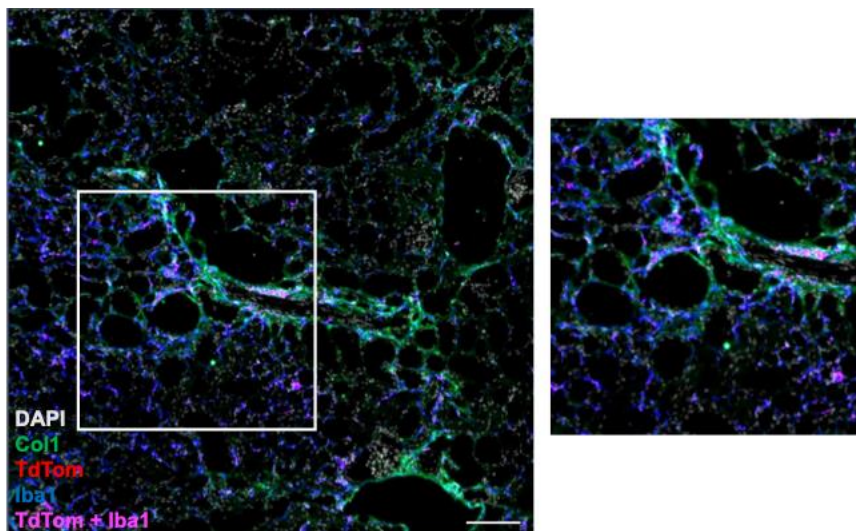
 Immunofluorescence staining of a *Ccr2*-CreER[T2+/-]-TdTomato^{+/-} kidney showing localisation of TdTomato[+] (Ccr2^{+}) macrophages in the obstructed kidney. DAPI (white), collagen (Col1 – green), Ccr2 (TdTomato – red), macrophages (Iba1 – blue). TdTomato[+] Iba1^{+}macrophages appear in pink. Scale bar = 100 μm.

Poster number: 141

Submission number: 424

Dissecting the contributions of leukocyte and resident kidney cell-produced thymosin β4 in experimental glomerular disease

<u>Miss Cheuk Yan Man</u>[1], Dr Hortensja Brzóska[2], Prof Owen Williams[2], Dr Michael Robson[3], Prof Jonathan Elliott[1], Prof David Long[2], Dr Elisavet Vasilopoulou[1]

[1]Comparative Biomedical Sciences, The Royal Veterinary College, London, UK. [2]Developmental Biology and Cancer Programme, UCL Great Ormond Street Institute of Child Health, London, UK. [3]School of Immunology and Microbial Sciences, King's College London, London, UK

Miss Cheuk Yan Man

Biography
Cheuk Yan Man is a second-year PhD student at the Royal Veterinary College. She is currently undertaking a research project titled "Thymosin-β4-mediated regulation of macrophage accumulation and function in chronic kidney disease", supervised by Dr Elisavet Vasilopoulou and Prof Jonathan Elliott.

Abstract

Background: Glomerular disease involves both injury of glomerular cells and inflammatory responses that drive disease progression. Thymosin β4 (Tβ4) is a peptide that is expressed in podocytes and macrophages in the mouse kidney and has a protective role in glomerular disease. Tβ4-knockout mice develop exacerbated glomerular disease compared to wild-type controls, with impaired renal function, reduced podocyte number and increased macrophage accumulation. However, the precise contribution of macrophage and resident kidney cell-produced Tβ4 to glomerular disease progression is unknown. We hypothesised that Tβ4 expression by both macrophages and resident kidney cells is beneficial in glomerular disease.

Methods: Transplantation of bone marrow cells from wild-type (WT) or Tβ4-knockout (KO) mice into irradiated recipient mice was carried out to generate four groups of chimeric mice; WT mice with WT bone marrow (WT/WT, n=9), WT mice with KO bone marrow (WT/KO, n=6), KO mice with WT bone marrow (KO/WT, n=6) and KO mice with KO bone marrow (KO/KO, n=7). Glomerulonephritis was induced ten weeks later by administration of nephrotoxic serum (NTS). Bone marrow reconstitution (flow cytometry), macrophage accumulation, podocyte density (immunohistochemistry), albuminuria (ELISA) and blood urea nitrogen (BUN; quantitative colorimetric assay) were assessed 21 days post-NTS.

Results: Bone marrow transplantation was efficient with >75% of circulating cells being donor-derived. Macrophage accumulation in the periglomerular area was significantly lower in WT/WT mice (10.18 ± 0.34 macrophages/glomerulus) compared with WT/KO (13.73 ± 0.49, p<0.0001), KO/WT (15.24 ± 0.46, p<0.0001), and KO/KO mice (18.26 ± 0.47, p<0.0001). Podocyte density was highest in WT/WT mice (6.64 ± 0.18 podocytes/100µm^2) compared with WT/KO (5.54 ± 0.19, p<0.0001), KO/WT (5.98 ± 0.22, p=0.0083), and KO/KO mice (4.94 ± 0.14, p<0.0001). Albuminuria was significantly lower in WT/WT (9,947±3,403 µg/24 hours) compared with KO/KO mice (29,177 ± 4,838, p=0.0070), but there were no

statistical differences with WT/KO (13,468 ± 3,056) and KO/WT (14,635 ± 3,729) mice. BUN concentration was significantly higher in KO/KO mice (98.51 ± 1.24 mg/dL) compared to WT/KO (75.23 ± 2.94, p<0.0001), KO/WT (81.00 ± 4.50, p=0.0016), and WT/WT mice (72.48 ± 2.414, p<0.0001).

Discussion: Our findings reveal that Tβ4 expression by both bone marrow-derived and kidney-resident cells has a protective role in glomerular disease, with global Tβ4 loss resulting in the most severe disease phenotype.

ANKHD1 promotes cell survival in serum-starved renal cells

Miss Jordan Mullenger[1,2,3], Dr Martin Zeidler[1], Dr Maria Fragiadaki[3]

[1]School of Biosciences, University of Sheffield. [2]Infection, Immunity and Cardiovascular Disease, University of Sheffield. [3]Translational Medicine and Therapeutics, Queen Mary University, London

Miss Jordan Mullenger

Biography
Jordan is a third-year PhD student in the laboratory of Dr Maria Fragiadaki, the Department of Biosciences at the University of Sheffield. She is currently performing her research at the William Harvey Research Institute, Department of Translational Medicine and Therapeutics at Queen Mary University, London. Jordan's project is funded by the University of Sheffield as part of a Future Leaders Fellowship award to Dr Fragiadaki (UKRI; MR/T04201X/1). Jordan's co-supervisor is Dr Martin Zeidler. Her research focuses on the RNA-binding protein ANKHD1 and its function in both the healthy and diseased kidneys. Jordan can be contacted at jlmullenger1@sheffield.ac.uk.

Abstract

Introduction- Ankyrin repeat and single KH domain-containing protein 1 (ANKHD1) is a ubiquitously expressed RNA binding protein composed of two stretches of ankyrin repeat domains that mediate protein-protein interactions and a KH domain that mediates nucleic acid binding. ANKHD1 is overexpressed in numerous cancers, including renal cell carcinoma, where it drives proliferation, growth, and enhanced tumorigenicity. At a clinical level, increased expression of ANKHD1 is associated with greater tumour infiltration, increased metastasis, larger tumours, and more tumorous nodules, resulting in poorer prognosis and a decrease in patient survival. Our lab has predicted a similar functional role for ANKHD1 in autosomal dominant polycystic kidney disease (ADPKD), a condition characterised by excessive proliferation resembling early tumorigenesis. The role of ANKHD1 in both renal diseases and healthy renal cells is currently unknown and a focus of my PhD.

Methods- Recombinant, FLAG-tagged ANKHD1 (full-length and a deletion construct containing only the ankyrin domains of the protein) was produced in HEK293T cells and validated using western blotting and immunofluorescence. Protein was produced and was in frame with the tag, allowing for protein purification via immunoprecipitation of both the ANKHD1 protein and its binding partners. The protein binding partners then underwent subsequent identification via unbiased mass spectrometry. Cells were exposed to stress by replacing their media with serum-free media for 24 hours. Cell viability and cellular function was assessed by MTT and immunoblotting.

Results- Recombinant human ANKHD1 was successfully pulled down via immunoprecipitation along with its protein binding partners in HEK293T cells. I performed an unbiased screen of the interactome of ANKHD1 by mass spectrometry, revealing 344 interacting proteins. Enrichment analysis of the kidney specific ANKHD1 interactors and bioinformatics analysis of previously identified interacting

proteins revealed an overlap of 13 core proteins involved in cellular stress response. To examine its potential role in cellular stress, I performed serum starvation assays in HEK293T. Stressed cells showed a significant decrease in cell viability when compared with cells kept under non-stressed conditions. Critically, overexpression of either full-length or truncated ANKHD1 was able to restore viability in cells exposed to serum starvation. Further analysis revealed that ANKHD1 overexpression does not alter proliferation (PCNA or MYC protein levels) or apoptosis (cleaved PARP). However, ANKHD1 led to a trend towards increased serine phosphorylation of AKT, a major pro-survival kinase.

Discussion- ANKHD1 has been demonstrated to interact with core proteins involved in the response to cellular stress, and a novel role for the protein has been identified in the increased viability of cells containing increased levels of ANKHD1 to serum starvation. This could provide an insight into the cytoprotective role of ANKHD1 in both the healthy and diseased kidney. The precise mechanism of how ANKHD1 alters viability in cells under stress is currently under investigation for the remainder of my PhD project.

Poster number: 143

Submission number: 476

Generation of a tissue resident macrophage depleted reporter rat to examine cardiovascular homeostasis and kidney disease.

Ms Heeyoun Hur[1], Prof Patrick Hadoke[1], Dr Clare Pridans[2], Dr Laura Denby[1]

[1]Centre for Cardiovascular Science, University of Edinburgh. [2]Centre for Inflammation Research, University of Edinburgh

Ms Heeyoun Hur

Biography
Heeyoun Hur is a second-year doctoral student at the University of Edinburgh working on 'defining the function of tissue-resident macrophages in cardiovascular homeostasis and progressive kidney disease' as part of the British Heart Foundation 4-Year PhD program. As part of the program, Heeyoun achieved a distinction in the integrated MScR along with the student prize (2021). Before studying in Edinburgh, she obtained a BSc. Hons. in Biomedical Sciences (Physiology) from the University of Aberdeen (2015-2019), and an MSc. in Cardiovascular Biology from the University of Glasgow (2019-2020). She can be contacted at: h.hur@sms.ed.ac.uk.

Abstract

Cardiovascular disease (CVD) and chronic kidney disease (CKD) are currently the 1st and 10th leading cause of global mortality, respectively. By 2050, CKD is predicted to be the 5th leading cause, with most of those individuals dying of CVD. Recent single-cell RNA sequencing data has highlighted the plasticity of macrophage populations in both renal and cardiovascular injury and repair. Many of these subpopulations of macrophages remain uncharacterized.

We have generated the Red FIRE rat, which is a cross between the *Csf1r*-mApple reporter rat and the *FIRE* knockout rat. The Csf1r-mApple reporter rat introduces a fluorescent signal to cells of the monocyte-macrophage lineage, while the FIRE rat has fms-intronic regulatory element (FIRE), which is the super-enhancer in the Csf1r locus, knocked out, resulting in depletion of tissue-resident macrophages of the skin, peritoneum, kidney and heart.

These red FIRE rats will allow us to visualize all *Csf1r* expressing cells (macrophages) and in the FIRE rats deplete populations of tissue-resident macrophages (TRM) (including those in the kidney and heart). This will enable us to visualize and study TRM populations in homeostasis and injury. We hypothesise that the red FIRE rats will show a more severe phenotype in injury and have altered vascular function (local and systemic).

Male and female (8–10-week-old) rats underwent a 6- or 12-week 5/6 subtotal nephrectomy (5/6 STNx) in groups of 4-8. Baseline, midpoint and endpoint urine and serum were collected for analysis, as well as blood pressure measurements and echocardiograms to monitor kidney and heart health/decline. At the end of the experiment, the kidneys and the heart were collected for flow cytometry, immunofluorescence, RT-qPCR, and histological staining. The thoracic aorta, mesentery, and common renal arteries were collected for functional analysis using isometric (wire)myography.

The knockout of the FIRE super-enhancer resulted in the depletion of kidney TRMs (Figure 1) as visualized by immunofluorescent staining of both wild-type and macrophage-depleted (red FIRE) rat tissue. Figure 1A shows the composite image and individual stains; DAPI, IBa1 (pan macrophage marker), and *Csf1r*-mApple (tissue resident macrophages) on a naïve heart. Representative composite images also compare STNx hearts (Figure 1B) and kidneys (Figure 1C) in both wild-type and macrophage-depleted rats. This allowed for a comparison of these rats in both injury and homeostasis.

Our preliminary data suggests previously undescribed roles for tissue-resident macrophages in rats i.e. ion handling, vascular homeostasis, and roles in CKD and repair. These results could help reveal new specific druggable targets that could be exploited for treatments that could halt the progression of the disease and thus reduce end-stage renal failure patient numbers, healthcare costs, and premature CVD-related deaths.
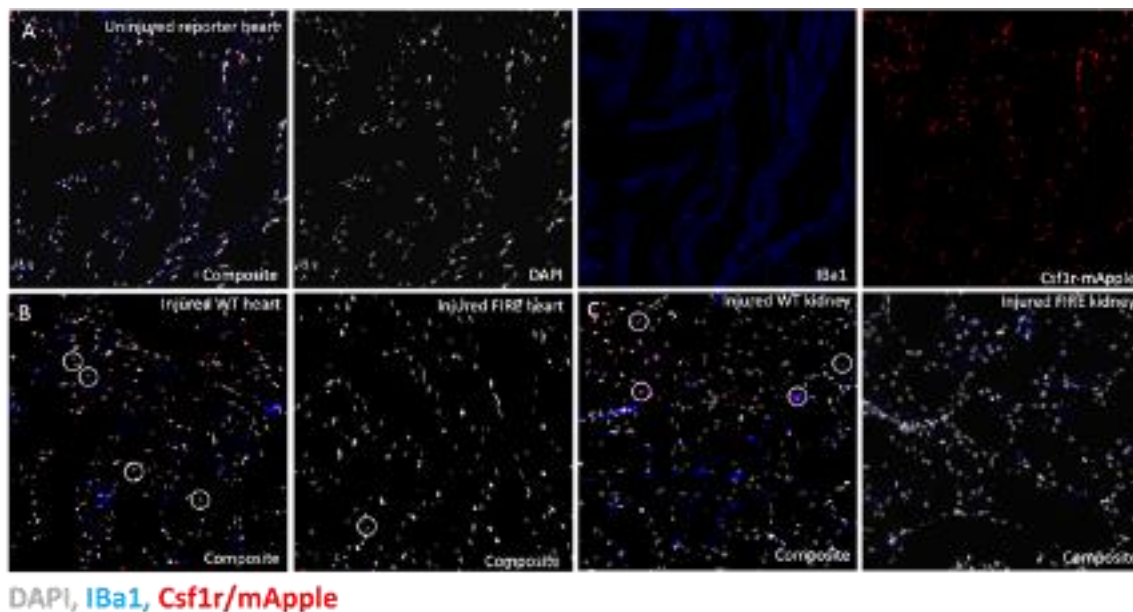
Figure 1: Immunofluorescent staining of the uninjured heart of a FIRE wild type (WT), mApple positive rat (A), the injured kidney (B) and heart (C) of mApple positive, FIRE wild type (Control) or mApple positive, FIRE knock out (FIRE) rats post 12-week 5/6 subtotal nephrectomy (5/6 STNx). DAPI: nuclei, IBa1: all macrophages, csf1r (mApple): tissue-resident macrophages. *Representative imagining, figure made using FIJI.*

Poster number: 144

Submission number: 618

Dysregulation of Urinary Exosomal miRNA Provides Diagnostic and Therapeutic Insights for Autosomal Dominant Polycystic Kidney Disease

Dr Hamad Ali

Kuwait University, Kuwait. Dasman Diabetes Institute, Kuwait

Dr Hamad Ali

Biography

Dr. Hamad Yaseen Ali is an assistant professor of Genomic Medicine in the Health Sciences Center in Kuwait University, Research Associate at Dasman Diabetes Institute in Kuwait and a board member in Kuwait Scientific Center. He completed his Bachelor of Sciences in Molecular Genetics from The Ohio State University in 2005 and then earned his MSc. and PhD in Medical Genetics from the Institute of Genetic Medicine in Newcastle University in the UK. Hamad's research focuses on the molecular diagnosis of Chronic kidney diseases including Autosomal Dominant Polycystic Kidney Disease (ADPKD) and Diabetic nephropathy. He is currently investigating the potential use of urinary exosomes as biomarkers for disease diagnosis and progression. Hamad's research team includes researchers and clinicians from Kuwait University, Kuwait's Ministry of Health, University Collage of London in the UK and Mayo Clinic in the USA. His research projects are funded by Kuwait University and Kuwait Foundation of Advancement of Sciences (KFAS).

Abstract

Background: Autosomal Dominant Polycystic Kidney Disease (ADPKD) is the most prevalent monogenic renal disorder, characterized by bilateral renal cysts leading to end-stage renal disease. There is a critical need for early biomarkers and novel therapeutic strategies in ADPKD.

Methods: In this study, we conducted a comprehensive profiling of small RNAs in human urinary extracellular vesicles from patients with ADPKD, employing small RNA sequencing. The differential expression of these RNAs was analyzed and compared with that of healthy control individuals.

Results: We identified several differentially expressed microRNAs (DE-miRNAs) and PIWI-interacting RNAs (pi-RNAs) in ADPKD patients. Notably, miR-320b, miR-320c, miR-146a-5p, miR-199b-3p, miR-671-5p, miR-1246, miR-8485, miR-3656, has_piR_020497, has_piR_020496, and has_piR_016271 were significantly upregulated, while miRNA-29c was downregulated in the extracellular vesicles of ADPKD patients. Using miRNet, we predicted numerous target genes for both upregulated and downregulated miRNAs, leading to the construction of a DE-miRNA-target gene regulatory network. Analysis of this network highlighted key 'driver' target genes (MCL1, EDC3, FMNL3, NACC1, KCTD15) and 'key' DE-miRNAs (miR-320c, miR-146a-5p, miR-199b-3p, miR-671-5p, miR-29c-3p). Functional analysis of these target genes revealed their involvement in crucial ADPKD-related biological processes.

Conclusion: This study offers significant insights into the pathogenesis of ADPKD, identifying novel biomarkers and potential drug targets. The findings, validated using publicly available GEO database data on human ADPKD cysts, contribute to our understanding of ADPKD and pave the way for developing strategies to slow disease progression.

Case reports 1

Poster number: 145

Submission number: 138

Immunotactoid Glomerulopathy: A Comprehensive Analysis of Three Cases Highlighting Varied Clinical Presentations, Diagnostic Challenges, and Association with Lymphoproliferative Malignancies

Dr. Ross-Michael desVignes[1], Dr. Farid Ghalli[2], Dr. Jake Parnian[1]

[1]Worthing Hospital, Worthing. [2]Sussex Kidney Unit, Brighton and Sussex Medical School

Dr. Ross-Michael desVignes

Biography
Internal Medicine Trainee at University Hospitals Sussex with an interest in Renal Medicine. Bsc in Basic Medical Sciences, M.B.B.S, MRCP UK. I am greatly interested in exploring a future in renal vasculitis, dialysis, and interventional nephrology. My other interest includes Medical Education. I currently organize the IMT weekly teachings for Chichester and Worthing Hospital and have been involved in delivering SIM and other teaching sessions for the Medical Students at Brighton and Sussex Medical School.

Abstract

Introduction:

Immunotactoid glomerulopathy (ITG) is an uncommon cause of glomerular disease encountered in approximately 0.06% of native kidney biopsies. This fibrillary disease is strongly associated with haematologic disorders, including lymphoma (mainly chronic lymphocytic leukaemia/small lymphocytic lymphoma), monoclonal gammopathy, and multiple myeloma. It is usually managed with oral steroids and/or treatment of an underlying lymphoproliferative disorder. Here, we report three cases of ITG, all female patients with varying severity of the disease, timing of malignancy and required treatment.

Case Scenarios

Case 1:

A 76-year-old lady with no significant medical background presented in May 2020 with confusion and progressive peripheral oedema. She had AKI (serum creatinine 210 µmol/L from baseline 68 µmol/L) and a sodium of 104 mmol/l. Urine PCR was 1182 mg/mmol. She was admitted to the ITU, where hyponatraemia was managed with a good clinical response. Blood screening showed negative immune, myeloma and virology screens. Complement was low. A renal biopsy showed a diagnosis of ITG. She had an extensive malignancy screen, but no malignancy was detected. She was started on prednisolone 60 mg once daily and eventually weaned off the drug by March 2021, as she maintained remission of her

disease. Two years after her initial presentation, she was seen by the ophthalmologist for a right lacrimal gland mass. This was excised, and a biopsy revealed a MALT Lymphoma.

Case 2:

A 50-year-old lady with splenomegaly being investigated under the haematology service was referred to our renal clinic for proteinuria in June 2019. Her serum creatinine was within normal limits, and her UPCR was 302 mg/mmol. She had no paraprotein in her blood, low serum immunoglobulins, low C3 and a negative viral screen. Perindopril, initiated by her GP, was up-titrated. Renal biopsy revealed features in keeping with Immunotactoid Glomerulopathy, and completed haematological investigations revealed Chronic Lymphocytic Leukaemia. Her UPCR peaked at 842 mg/mmol before reducing to 190 mg/mmol within a year after treatment with Veneclotax and Rituximab after not tolerating FCR (Fludarabine, Cyclophosphamide, Rituximab) Chemotherapy.

Case 3:

A 69-year-old lady presented to the renal clinic with proteinuria in September 2018. She had a background of breast cancer diagnosed in 2007 (She had surgical resection followed by radiotherapy). Her 24-hour urine protein was 2g, and UPCR was 155 mg/mmol. Serum creatinine was 81 mmol/l and eGFR 66 ml/min. P- ANCA was positive, while PR3 and ANA were negative. She had bilateral leg oedema due to long-standing lymphedema. The biopsy report showed immunotactoid glomerulopathy. Regular surveillance of previous breast cancer with mammography and CT-CAP has shown no evidence of malignancy recurrence, hepatitis virology and paraprotein were negative, and C3/C4 were within normal limits. She had improved UPCR and maintained normal kidney function on full-dose Losartan.

Conclusion:

 Immunotactoid Glomerulopathy is a rare form of glomerular disease with a strong association with lymphoproliferative malignancies, which may precede, occur concomitantly or present years after the initial diagnosis. This common association highlights the need for diligence in screening for malignancy in each case, and it is a reason for careful follow-up of these patients. Treatment of underlying disorders is associated with positive renal outcomes, and in some cases, there is a good response to steroids.

Poster number: 146

Submission number: 492

Prolonged Renal Phosphate Wasting and Hypophosphatemia Post Ferric Carboxymaltose Infusion: A Case Study

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Dr Ross-Michael desVignes

Biography
Internal Medicine Trainee at University Hospitals Sussex with an interest in Renal Medicine. Bsc in Basic Medical Sciences, M.B.B.S, MRCP UK. I am greatly interested in exploring a future in renal vasculitis, dialysis, and interventional nephrology. My other interest includes Medical Education. I currently organize the IMT weekly teachings for Chichester and Worthing Hospital and have been involved in delivering SIM and other teaching sessions for the Medical Students at Brighton and Sussex Medical School.

Abstract

Introduction:

Hypophosphatemia is a well reported complication of intravenous iron infusion. This phenomenon is caused by acute increases in circulating concentrations of fibroblast growth factor-23 (FGF23), leading to reduced proximal tubular reabsorption of filtered phosphate and inappropriate urinary phosphate excretion. Randomized trials and meta-analysis have reported high incidences of hypophosphatemia, ranging from 47%-75%, among those treated with Ferric Carboxymaltose (FCM) versus <10% among patients treated with other formulations. Initially thought to be brief and self-limiting, recent publications have suggested that FCM-induced Hypophosphatemia can last for weeks to years [3]. Here, we report an atypical case of FCM-induced Renal Phosphate Wasting, causing recurrent hypophosphatemia and significant morbidity over an almost 2-year period.

Case

A 35-year-old female was seen in our clinic in March 2023, having been referred for renal phosphate wasting. She had post-COVID-related food intolerances, and subsequent self-imposed dietary restrictions led to iron-deficiency anaemia. She received 1000mg intravenously of ferric carboxymaltose iron infusion in July 2022 and two days later presented to the hospital with collapse, muscle weakness, and pain. Investigations revealed a phosphate of 0.53 mmol/L with no other explanation for her symptoms. Blood tests dating back to 2017 showed no previous issues with hypophosphataemia. PTH, ALP and vitamin D were all normal at onset of symptoms, whilst on oral vitamin D supplementation. Over three days, she required three doses of intravenous phosphate (Polyfusor) to replace her deficit with subsequent resolution of her

symptoms. She was discharged on maximum dose oral phosphate tablets and was not able to be weaned off over the following 13 months. She had recurrent symptomatic episodes of hypophosphatemia between July 2022 and January 2024. The 24-hour urine phosphate was elevated at 99.4 mmol/d and the Fractional Excretion phosphate (PEPO4) was 65.7% indicating urinary phosphate wasting.   Further tests revealed no primary renal cause of her condition, such as Fanconi Syndrome or evidence of osteomalacia and her immune screen was negative. Between September and November 2023, serum phosphate level continued to improve and gradual weaning of phosphate supplements started. She came off all the six phosphate tablets in November. Her last serum phosphate in January 2024 was 1.25 mmol/l.

Discussion & Conclusion:

Renal phosphate wasting and hypophosphatemia occur frequently post ferric carboxymaltose infusion. In this case, we highlight how FCM-related hypophosphatemia and renal phosphate wasting can have a prolonged course. In addition, the case demonstrates the morbidity associated with this problem. Despite this, national and local protocols to guide phosphate monitoring post intravenous iron infusion are uncommon. Key risk factors identified for iron-induced hypophosphatemia include the use of FCM, low baseline serum phosphate levels, and weight-adjusted iron dose. However, as far as we know, this data has not yet led to any national recommendations to use one intravenous iron formulation over another preferentially. We feel that spreading awareness about this post-infusion dangerous complication is mandatory.

Poster number: 147

Submission number: 199

Diagnosis of T-cell acute lymphoblastic leukaemia on renal biopsy in a patient presenting with dialysis-requiring acute kidney injury

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Dr Ashley Smith

Biography
Specialty Registrar in Nephrology and General Internal Medicine.

Abstract

We present the case of a 25 year old Caucasian man who presented to the Emergency Department unwell with a stage 3 acute kidney injury (AKI) requiring acute haemodialysis. Renal biopsy later confirmed an unexpected diagnosis of T-cell acute lymphoblastic leukaemia (T-cell ALL).

Our patient was fit and well until around two months prior to admission when he experienced an episode of right flank pain and haematuria for which he self-medicated with several days of Ibuprofen and was treated empirically for a urinary tract infection in primary care. Over subsequent weeks, he developed several episodes of epistaxis, progressive lethargy, and loss of appetite. Blood tests in the community revealed a severe AKI and profound anaemia (Urea 65mmol/L, Creatinine 1,558umol/L, Haemoglobin 60g/L) leading to urgent hospital admission. Upon admission, he promptly initiated acute haemodialysis for symptomatic uraemia.

In terms of investigations, renal tract ultrasound demonstrated normal sized kidneys with increased cortical echogenicity. Dipstick urinalysis was positive for nitrites, leukocytes, blood (1+), and protein (2+). Urine PCR was mildly raised at 26mg/mmol. Immunology screening was negative for anti-glomerular basement membrane antibodies, anti-nuclear antibodies, anti-double-stranded DNA antibodies, anti-myeloperoxidase and anti-proteinase 3 antibodies. Serum complements 3 and 4 were normal and serum / urine electrophoresis was unremarkable. Hepatitis B and C antibodies, HIV antigen / antibody, and EBV / CMV PCR were all negative. He had a mildly raised IgA at 3.9g/L with normal IgG and IgM. Total white cell count was elevated at 16.4×10^9/L on admission, which later normalised. Note was made of a persistently raised monocyte count at 2.30×10^9/L. Platelets were normal throughout and his haemoglobin appropriately incremented following blood transfusion. Lactate dehydrogenase was also normal.

Due to the concern for a rapidly progressive glomerulonephritis, a decision was taken to give three pulses of intravenous methylprednisolone (500mg daily). Subsequent renal biopsy was performed which demonstrated a focal interstitial infiltrate of enlarged atypical T-cells with positivity for CD3 and terminal deoxynucleotidyl transferase (TdT). Patchy acute tubular injury was also noted with neutrophil casts in

some tubules. Sampled glomeruli and arteries were all normal and there was no specific staining on immunohistochemistry.

Throughout the admission he received a total of five sessions of haemodialysis before his urine output improved and he became dialysis independent with a discharge Creatinine of 142umol/L.

Based upon the renal biopsy findings he was transferred under the care of Haematology. An urgent bone marrow biopsy revealed 60% blasts with 55% lymphoblasts. PET-CT imaging demonstrated avid uptake in the bone marrow, heterogenous uptake in both renal cortices, and low-grade lymph nodes above and below the diaphragm. A diagnosis of T-cell ALL was established and he was commenced on the UK Acute Lymphoblastic Leukaemia Regimen B treatment protocol. Post-induction bone marrow biopsy and repeat PET-CT demonstrated a complete response.

T-cell ALL is responsible for around 25% of all adult cases of ALL. Renal failure represents a rare primary disease manifestation with varied aetiology, including infection, ureteric obstruction, tumour lysis syndrome, and, as we describe, direct renal infiltration by leukaemic cells.

Poster number: 148

Submission number: 203

An unusual case of peritoneal dialysis peritonitis secondary to Pluralibacter gergoviae

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Dr Ashley Smith

Biography
Specialty Registrar in Nephrology and General Internal Medicine.

Abstract

Peritonitis is a leading cause of morbidity, mortality, and technique failure amongst patients receiving peritoneal dialysis (PD). The most frequent causative organism is Staphylococcus epidermidis, a common skin commensal, although other coagulase negative Staphylococci, Streptococci, and gram-negative species such as Pseudomonas are also frequently recognised. Here we present an unusual case of PD peritonitis secondary to the bacterium Pluralibacter gergoviae.

Our patient was a 45 year old Asian lady with a background of end stage renal failure secondary to reflux nephropathy who had received a pre-emptive renal transplant nine years prior. She had been established on PD for around 2 years following graft failure (chronic rejection) and remained on Tacrolimus to prevent sensitisation for future transplants. She presented acutely with a two day history of abdominal pain, fevers, and cloudy PD effluent. PD fluid analysis revealed >100 pus cells/mm^3 and routine blood tests demonstrated a raised C-reactive protein (CRP) at 59.6mg/L and a mild neutrophilia (8.28x10^9/L). She was treated for PD peritonitis as per local protocol with intra-peritoneal (IP) Vancomycin (30mg/kg on day 1) and Ciprofloxacin (50mg/L in each exchange). Subsequent fluid culture confirmed a growth of Pluralibacter gergoviae after less than 24 hours of incubation. Based on sensitivity results, Vancomycin was stopped and IP Ciprofloxacin was continued with each exchange. Admission blood cultures were negative. A CT scan of the abdomen and pelvis excluded any secondary causes of peritonitis. Despite three days of appropriate antimicrobial therapy, she continued to complain of severe abdominal pain, her PD effluent remained cloudy, and her CRP rose to a peak of 225mg/L. As such, a decision was taken to remove her PD catheter. Following catheter removal her clinical condition rapidly improved and she was discharged on a two week course of oral Ciprofloxacin. She was subsequently followed-up in clinic and was found to have made a full recovery and so a tunnelled haemodialysis catheter was placed.

Pluralibacter gergoviae (formally Enterobacter gergoviae) is a gram-negative facultative anaerobe and a member of the Enterobacteriaceae family. The species was first described in 1980 and was subsequently placed in the genus Pluralibacter as P. gergoviae based on genetic sequence analysis. Since then, it has been reported to contaminate cosmetic formulations and cause various nosocomial outbreaks. More

recently, multi-drug resistant strains harbouring resistance genes including carbapenemases have emerged, causing serious healthcare challenge and public health concern.

To our knowledge, this is the first published case of PD peritonitis secondary to Pluralibacter gergoviae in Europe. The requirement for catheter removal, and hence modality switch to haemodialysis, is common to a previous published case of P. gergoviae PD peritonitis from Malaysia in 2017, highlighting the challenge to treatment. As with all cases of PD peritonitis, prompt commencement of antimicrobial therapy is vital, coupled with a low index of suspicion for refractory infection.

Poster number: 149

Submission number: 204

Renal biopsy diagnosis of probable Fabry disease in a patient with antenatal hypertension and proteinuria

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Dr Ashley Smith

Biography
Specialty Registrar in Nephrology and General Internal Medicine.

Abstract

We present a case of antenatal hypertension and proteinuria diagnosed as likely underlying Fabry disease on the basis of renal histology.

Our patient, a 33 year old primip of Asian descent, was 20 weeks pregnant at the time of referral to renal clinic. She was referred on the basis of hypertension (blood pressure 139/101mmHg) and significant proteinuria (urine protein:creatinine ratio [PCR] 209mg/mmol) detected as part of routine antenatal care. She was otherwise fit and well, although she reported at least a two year history of mild hypertension during contraceptive pill checks with the GP. She was not taking any regular medication. She had a significant family history of hypertension but no known family history of renal disease. Her serum Creatinine and Albumin were both appropriate for gestation (46umol/L and 31g/L respectively).

In terms of investigations, she had a normal renal tract ultrasound and normal oral glucose tolerance test. Immunology screening was negative for anti-nuclear antibodies, anti-neutrophil cytoplasmic antibodies, and anti-phospholipase A2 receptor antibodies. Serum complement 3 was mildly raised at 2.21g/L but complement 4 was normal. Immunoglobulin were normal with no paraprotein on electrophoresis.

Throughout the course of her pregnancy, her hypertension was managed with Labetalol. Despite this, her proteinuria continued to rise and so she was anticoagulated with low molecular weight heparin. Her urine PCR peaked at 2,275mg/mmol. In light of this and features of intrauterine growth restriction, a decision was taken to deliver by category 1 emergency Caesarean section at 37 weeks gestation. Following delivery, her proteinuria persisted at around 500mg/mmol and she remained hypertensive. Ten months post-partum (delayed due to poor blood pressure control) she proceeded to renal biopsy.

Renal biopsy demonstrated hypertrophic glomeruli. Of the twenty-eight sampled glomeruli, one was globally sclerosed and five demonstrated features of focal segmental glomerulosclerosis (FSGS). There was minimal evidence of interstitial scarring and mild vascular hyaline arteriolosclerosis. Immunohistochemistry was unremarkable. Electron microscopy demonstrated

expanded podocyte cytoplasm with laminated electron dense deposits consistent with lipid deposition (Zebra bodies). Podocyte foot processes were generally preserved. These features were felt to be in keeping with a histological diagnosis of probable Fabry disease. On this basis, she has been referred for formal genetic testing and white cell enzymology, the results of which are awaited.

Fabry disease is a x-linked lysosomal storage disorder caused by loss of function mutations in the gene encoding α-galactosidase A, an enzyme required for catabolism of sphingolipids. In males, it is characterised by a range of features including progressive renal dysfunction, ophthalmic, neurologic, and cardiac symptoms. Disease manifestation in heterozygous females has only been recognised in recent years and can be highly variable. Recent analysis of international Fabry registry data reports proteinuria in around a third of heterozygous females, with neuropathic pain and cardiac features (palpitations and ventricular hypertrophy) the most frequent manifestations. Early diagnosis is important for the provision of enzyme replacement therapy to delay disease progression.

Poster number: 150

Submission number: 210

Acute kidney injury secondary to hypertension-related thrombotic microangiopathy: A case report and literature review

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Dr Achilleas Blatsos

Biography
MD

Abstract

One of the major challenges renal physicians continue to face is patients with acute kidney injury with microangiopathic haemolytic anaemia and thrombocytopenia, as the differential diagnosis is very broad and urgent treatments, such as plasma exchange and anti-complement therapy are usually required. On that note, we report a case of a patient from our unit with acute kidney injury secondary to hypertension-related thrombotic microangiopathy and describe the clinical course from initial presentation to diagnosis and treatment.

The characteristic triad of thrombotic microangiopathy (TMA) includes thrombocytopenia, microangiopathic haemolytic anaemia and organ injury. Malignant hypertension continues to be an important and, often, unrecognised cause of TMA. TMA is associated with high mortality and morbidity, including end-stage renal disease, therefore early recognition and management is crucial.

In our report, we discuss the case of a 71-year-old female who was referred by her general practitioner with a new finding of raised serum creatinine on routine laboratory tests, organised to investigate her worsening fatigue and leg swelling. Her presenting creatinine levels were 241 µmol/L from a baseline creatinine of 63 µmol/L three months ago. She was hypertensive with blood pressure values ranging between 170/80 and 190/90 mmHg and clinical evidence of fluid overload. Her haemoglobin was 78 g/L with a platelet count of 123×10^9/L with presence of fragmented red blood cells and undetectable levels of haptoglobin. The working diagnosis of TMA was made, and she was initially managed with intravenous diuresis with furosemide and blood pressure control. A full workup was performed to investigate causes of TMA including infection screen, autoimmune and vasculitis profile, complement genetics and complement antibody testing. During the first week of admission, acute haemodialysis was initiated due to worsening urine output and fluid overload. Her case was discussed with the National Renal Complement Therapeutics Centre and a three-month trial of Eculizumab was instituted from the second week of admission. Despite that, she remained haemodialysis dependent, and her complement genetics and factor H autoantibodies were reported as negative. Her autoimmune screen was negative, and she showed to have normal ADAMTS13 activity with a kidney biopsy revealing features of acute thrombotic microangiopathy, predominately affecting the arteries and arterioles. Eculizumab was

withdrawn at three months as planned, as diagnosis was likely due to hypertension-related TMA rather than a primary complement-mediated event.

Hypertension-related thrombotic microangiopathy is a rare bur serious condition that can often lean to significant renal impairment requiring renal replacement therapy and carry high mortality without prompt investigation. The trigger is theorised to be direct endothelial damage and/ or complement-mediated processes, as certain patients can have complement dysregulation from unidentified genetic variations or risk alleles.

Poster number: 151

Submission number: 232

Transhepatic catheter access for haemodialysis in a patient with spina bifida

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Mei Yen Chan

Biography
Renal and medical registrar in the North East region

Abstract

Adults with spina bifida (SB) are at an increased risk of advanced chronic kidney disease and mortality[1]. The presence of SB also presents challenges related to vascular access for renal replacement therapies.

A 47-year-old patient with spina bifida and hydrocephalus had a right ventriculo-atrial (VA) shunt which eroded through the skin of her neck in November 2012. This was removed, and replaced with a left ventriculoperitoneal (VP) shunt. The patient also had a neuropathic bladder with ileal conduit formation, associated progressive CKD due to post-obstructive atrophic right kidney and previous bilateral renal struvite stones.

The patient was followed-up in renal clinic with an eGFR around 20ml/min in May 2022, but presented acutely in November 2022 in septic shock and anuric acute kidney injury requiring CVVH, facilitated through a temporary right femoral trialysis catheter. Point-of-care ultrasound showed chronic SVC occlusion (secondary to previous retained right VA shunt tip which was excised in 2013), with multiple collateral veins. An attempt at a right internal jugular line vein did not allow the guidewire to be inserted. On ultrasound, the right subclavian vein was not visualised and the left side was thrombosed. The patient developed a large haematoma around the right femoral trialysis catheter, which stopped functioning. A left-sided femoral catheter was therefore inserted. Dialysis was continued through a further three left-sided, non-tunnelled femoral dialysis catheters.

A multi-disciplinary meeting with interventional radiologists and surgeons suggested tunnelled femoral catheter (TFC) for long-term access. In patients with SB, due to non-closure of the neural tube, there is underdevelopment of the vascular system resulting in small lower limb arteries with lower blood flow and high wall shear stress.[2] This reduces the opportunity for femoral arteriovenous graft formation and increases the risk of critical ischaemia in the lower limb. Peritoneal dialysis is also complicated in the context of the ileal conduit and ventriculo-peritoneal shunt.

For the above reasons, the patient first had a TFC in January 2023. The cuffs were readily displaced requiring new catheters; in the subsequent eight months, she had a total of five TFCs. In September 2023, the left TFC came out following an exit site infection. Angiogram showed right common iliac vein occlusion. A decision was therefore made to proceed with transhepatic catheter access.

KDOQI recommendations for CVC access is in order of internal jugular, external jugular, femoral, subclavian and lumbar.[3] Transhepatic access is a relatively newer form of vascular access (introduced in 1994 by Po et al). In contrast to translumbar access, it can be used it patients with occluded IVCs and has lower risk of complications including haemorrhage and migration.[4]

Since its insertion in September 2023, the patient has required an exchange of the transhepatic catheter due to cuff exposure in October 2023. The new catheter has maintained dialysis uneventfully since then.

Conclusion: We report a case of successful tunnelled transhepatic catheter for haemodialysis due to difficult vascular access in a patient with spina bifida.

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Poster number: 152

Submission number: 233

MGRS - a new frontier in nephrology?

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Dr Sahana Gnanasampanthan

Biography
Dr Sahana Gnanasampanthan is currently an internal medicine trainee working in the renal department at Royal London Hospital, Barts Health NHS trust. She graduated from University College London in 2019 and was awarded a Merit in Clinical Practice. Dr Gnanasampanthan has co-authored multiple publications in the field of Nephrology and is keen to pursue a long-term academic career in Renal Medicine. She also has a keen interest in Medical Education and is completing a PGCert in higher education at Queen Mary University of London.

Abstract

Introduction

Monoclonal gammopathy of renal significance (MGRS) is an emerging concept within which monoclonal immunoglobulin dense deposit disease (MIDD) is a less commonly reported manifestation (1). We highlight the important clinical, biochemical and histopathological characteristics which can help lead to prompt diagnosis, individualised treatment and improved outcomes.

Case

A 60-year-old gentleman with a background of type 2 diabetes, hypertension and presumed diabetic nephropathy was initially admitted to intensive care for chest sepsis requiring intubation and filtration. On step-down to our unit, he was found to have nephrotic syndrome. A renal screen was unremarkable except for low IgM levels, a mildly elevated kappa light chain level (128.4 mg/l) with a moderately elevated lambda light chain level (43.3 mg/l). Serum free light chain (SFLC) ratio was mildly raised (2.96). Serum protein electrophoresis (SPEP), immunofixation and urine Bence Jones protein were all negative.

Kidney biopsy revealed acute tubular injury, but very little scarring (interstitial fibrosis and tubular atrophy). All 14 glomeruli were abnormal, lobulated and hypocellular in appearance. One glomerulus had lamellations appearing within a microaneurysm, and material forming the lobules were periodic acid-Schiff (PAS) positive. The material was faintly positive on silver stain. The glomeruli and the tubular basement membrane (TBM) stained for IgG. On electron microscopy, there was evidence of granular electron dense material along the glomerular basement membrane (GBM) and TBM, which is a typical finding for MIDD (2). Similar material was found in mesangial areas. We were able to demonstrate clearly IgG heavy chain, with no demonstration of light chain (LC) restriction. In summary, the findings

were consistent with a rare form of heavy chain only monoclonal immunoglobulin deposition disease (HCDD).

Discussion

MIDD usually presents in males over 50 with a moderate to severe degree of proteinuria (frequently nephrotic range in HCDD), hypertension and renal insufficiency, with a minority needing dialysis at the time of biopsy (2,3,4,5). Serum creatinine is a strong, and often only, predictor of renal outcome in MIDD (2,3), highlighting the importance of early detection. It is therefore prudent to carefully consider the clinical characteristics and key investigations (fig 1).

Importantly, increased SFLC ratio is a highly sensitive marker found in 100% of patients in most studies (3,6,7,8). Paraprotein on urine or SPEP is not always seen. Biopsy diagnosis can also often precede dysproteinaemia (2) perhaps posing some difficulty surrounding the decision to biopsy particularly in patients with established diabetes.

Our patient had minimal microvascular complications of diabetes, a well-controlled glycated haemoglobin (Hba1c) without documented proteinuria previously. Additionally, the nephrotic syndrome had not resolved after treatment for sepsis, despite otherwise good clinical recovery. Coupled with an increased SFLC ratio, an early biopsy was essential in making a timely diagnosis.

Current research regarding the optimal approach to managing MIDD in the context of MGRS are only from retrospective cohort studies, but suggest that the depth of haematological response is important for renal and overall survival, even in MGRS (6,7). A multidisciplinary approach to management is therefore key, to ensure the best outcomes for our patients.

Author, year	Nasr et Al, 2012 (1)	Pozzi et al, 2003 (12)	Kourelis et al, 2016 (8)	D.C.Ziogas et al, 2016 (10)	Sayed et al, 2015 (9)	Joly et al, 2019 (3)
No of patients, n	64	63	88	18	53	255
Mean age (range/SEM)	56 (22-83)	58 +/- 14.2	Median 56 (22-83)	66 (46-85)	Median 56 (29-78)	64 (53-75)
Male/female	42/22	40/23	58/30	10/8	37/16	133/122
Histopathology, n						
LCDD	51	63	74	14	53	63
HCDD	7	0	7	3	0	23
LHCDD	6	0	7	1	0	57
LCDD + CN	0	0	0	0	0	67
Renal characteristics						
HTN, %	83	NR	NR	89	94	55
Median sCr, mg/dl (range)	Mean 3.9 (0.9-15)	3.8	3 (0.9-15)	2.95 (0.7 - 13.2)	NR	269 umol/l (169-471)
Median eGFR, ml/min (range)	NR	NR	22 (2.5-83)	30.7 (5.2 - 99.3)	Mean 27 (0-79)	24.3 (11.9-42.9)
Dialysis at Biopsy, %	16	NR	18	NR	17	23
Median 24-hr protein, g (range)	Mean 4.1	2.7	2.5 (5.4 - 17.6)	3.3 (0.4 - 10.2)	Mean 4.1 (0.1-15.5)	1.8 (0.8-4)
Nephrotic range proteinuria, %	39 (>3g)	40 (>3.5g)	42 (>3g)	50 (>3.5g)	53 (>3g)	NR
Median serum albumin, g/dl (range)	Mean 3.5	NR	3.5 (1.7-4.6)	3.3 (2.4-4.6)	NR	3.3 (2.9-4)
Oedema, %	60	NR	NR	NR	NR	NR
Full nephrotic syndrome, %	23	NR	NR	NR	22	22
Microscopic haematuria, %	62	NR	NR	NR	90	58
Haematological characteristics, %						
Positive SPEP/SIFE	73	76	64	78	43	NR
Positive upep/uife	81	0.9	68	67	NR	NR
Abnormal SFLC ratio	100	NR	99	100	100	100
Light chain type, kappa/lamda	81/19	68/32	83/17	64/36	81/19	81/19
Monoclonal gammopathy, %						
None	56	NR	0	NR	NR	10
IgG	31	NR	58	NR	NR	39
IgA	13	NR	27	NR	NR	14
IgM	0	NR	14	NR	NR	6
Other	0	NR	1	NR	NR	30
Underlying pathology, %						
Multiple myeloma	59	65	21	0	NR	34
MGUS/MGRS	NR	32	42	NR	NR	64
WM	NR	0	2	NR	NR	1
Smoldering myeloma	NR	0	36	NR	NR	NR
CLL	NR	3	0	NR	2	0.4
B cell lymphoma	NR	0	0	NR	NR	0.8

CLL, Chronic lymphocytic leukaemia; CN, Cast nephropathy; eGFR, Estimated glomerular filtration rate; HCDD, Heavy chain deposition disease; HTN, Hypertension; LCDD, Light chain deposition disease; LHCDD, Light and heavy chain deposition disease; MGUS, Monoclonal gammopathy of unknown significance; MGRS, Monoclonal gammopathy of renal significance; NR, Not recorded; sCr, Serum creatinine; SFLC, Serum free light chain; SIFE, Serum immunofixation; SPEP, Serum protein electrophoresis; UPEP, Urine protein electrophoresis; UIFE, Urine immunofixation; WM, Waldenstrom macroglobulinemia

Fig.1

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Poster number: 153

Submission number: 283

Apixaban in membranous nephropathy: a case report of safe and effective Use

Dr Adam Carter[1], Dr Farid Ghalli[1,2]

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Dr Adam Carter

Biography
Dr Carter is a foundation doctor working at the Sussex Kidney Unit, Royal Sussex County Hospital. He read medicine at Oxford University, where he also completed a BA specialising in cardiovascular medicine. His interests are in internal medicine and medical education.

Abstract

Introduction

There is a high incidence of thromboembolism in patients with membranous nephropathy; therefore, anticoagulation is recommended. Direct oral anticoagulants (DOACs) are commonly prescribed for prophylaxis and treatment of thromboembolism. Due to their high protein binding, KDIGO guidelines currently do not recommend their use in nephrotic syndrome due to a lack of information about the effect of hypoalbuminaemia on pharmacokinetics and drug dosing. In this case report, we describe a patient with membranous nephropathy who was treated with apixaban for over one year without any complications.

Case History

A patient in his 50s with a background of hypertension presented with cough and shortness of breath, and was treated for pneumonia. Five months later, CTPA revealed bilateral pulmonary emboli (PE), for which he was started on apixaban. The following month, he developed bilateral lower limb swelling and was found to have proteinuria, so was referred to nephrology clinic.

On review in nephrology clinic, it was noted that the patient's albumin had decreased over the previous year (45g/L to 26g/L), and he reported frothy urine for a few months before the cough and shortness of breath started. 24-hour urine protein measurement was 13g/day. He had hypercholesterolaemia (total cholesterol 13mmol/L); eGFR was 47 ml/min.

He was worked up for nephrotic syndrome. He remained on apixaban, which was bridged for a renal biopsy. Renal biopsy showed membranous nephropathy. Anti-PLA2R was positive (179U/ml). He was started on tacrolimus, furosemide and atorvastatin, and continued ramipril full dose. This was followed by Rituximab infusion.

He made a good recovery. Albumin and urine PCR improved. Repeat anti-PLA2R turned negative.

He continued apixaban since the PE diagnosis until the diagnosis of membranous nephropathy was made, without any PE recurrence or new thrombosis. After the membranous diagnosis, the shift to warfarin was discussed, but he asked to continue apixaban. He continued apixaban throughout this period of over one year with no evidence of further embolism, thrombosis, or bleeding complications. Apixaban was stopped when serum albumin improved to >30 g/l since his PE was thought to be provoked by hypoalbuminaemia.

Discussion

The incidence of thromboembolism in patients with membranous nephropathy is high. In 2012, the Food and Drug Agency (FDA) licenced apixaban for use in haemodialysis patients. However, it is not yet licenced in the UK for this group of patients. Apixaban is heavily albumin-bound, and a hypoalbuminaemic and proteinuric state may alter its pharmacokinetics.

To date, case reports are promising about using DOACs in nephrotic patients. There are no published randomised controlled trials. A trial is ongoing to investigate the pharmacokinetics and pharmacodynamics of apixaban in nephrotic syndrome. From a practical standpoint, DOACs require less monitoring than warfarin and have fewer major drug interactions, rapid onset, and a short half-life.

Conclusion

While there is no strong recommendation for apixaban in patients with nephrotic syndrome, this case demonstrates its safe and effective use. Apixaban may represent a safe alternative to warfarin in patients with nephrotic syndrome. A large-scale study comparing the effectiveness of apixaban with warfarin in this condition is awaited.

Leukocytoclastic Vasculitis as a Novel Risk Factor for Non-Uraemic Calciphylaxis

Dr Alexandra Langberg[1], Dr Matthew Beresford[1,2], Dr Mohammed Boshara[3], Dr Martyn Fredlund[4]

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Dr Alexandra Langberg

Biography
I am a Foundation Year 2 doctor at North Bristol NHS Trust, currently working in Emergency Medicine. I have a broad interest in internal medicine and am enjoying exploring the variety that a hospital career has to offer.

Abstract

Background

Calciphylaxis is a rare life-threatening condition with a mortality rate as high as 60-80% (1). It is characterised by calcium deposition in arterioles, leading to fibrosis, thrombotic occlusion, and subsequent skin and soft tissue necrosis. Calciphylaxis is often seen in end-stage renal disease but can occasionally be seen in the absence of renal impairment, termed 'non-uraemic calciphylaxis' (NUC). NUC has been associated with several risk factors to include malignancy, liver disease, and warfarin (2, 3, 4), however published literature is scarce. Here we present a case report of an elderly female patient with leukocytoclastic vasculitis, who subsequently developed NUC, positing a novel association between these two rare conditions.

Case Presentation

A woman in her 70s, with a background of hypertension but no chronic kidney disease, was admitted to hospital following a six-month history of progressive multifocal lower limb ulceration and an acute kidney injury. Initial skin biopsies from previous admissions did not identify the presence of calciphylaxis, however biopsies of associated petechial lesions demonstrated evidence of a leukocytoclastic vasculitis. At the time of presentation, the patient had already undergone surgical debridement, maggot therapy, and skin grafting in previous admissions.

This admission revealed a large non-healing right lower limb ulcer with necrotic margins (Images 1 and 2). A few weeks into admission, the patient developed palpable purpura along both limbs and further ulceration (Images 3, 4, 5). The patient underwent thorough investigation and two further biopsies, with appearances still in keeping with a leukocytoclastic vasculitis, but with new histological changes indicative of calciphylaxis.

The patient was commenced on bisphosphonates and thrice weekly vitamin K, treated for superimposed infection with antibiotics, and received strict wound care. Interval review at four weeks demonstrated wound improvement. Unfortunately, one month later the patient was readmitted with uncontrolled pain and further infection – the patient subsequently developed severe pneumonia, multiorgan failure, and passed away.

Investigations and Management

Significant findings on bloodwork included a macrocytic anaemia, elevated CRP, and significant renal impairment. A broad screen did not reveal any evidence of systemic vasculitis, infection, or solid organ malignancy. Renal biopsy demonstrated acute tubular injury with no evidence of inflammatory pathology, and renal function subsequently returned to baseline.

Two subsequent skin biopsies confirmed the ongoing presence of leukocytoclastic vasculitis, and an additional finding of calciphylaxis (Images 6 and 7), which was new this admission.

Discussion

Our case suggests a potential novel association between leukocytoclastic vasculitis and NUC in a patient without other known risk factors. To our knowledge, this is the first case linking NUC with a small vessel vasculitis, although associations with other autoimmune conditions have been noted (5, 6, 7). Proposed mechanisms linking NUC with autoimmunity are varied and include hypercoagulability and presence of a local pro-inflammatory milieu (8).

Whilst further research is needed to explore this association, clinicians may benefit from increased awareness of the potential to develop calciphylaxis secondary to an area of cutaneous vasculitis. Early consideration of calciphylaxis as a differential in non-healing ulcers may lead to improved outcomes for patients by way of earlier diagnosis and access to treatment.

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Poster number: 155

Submission number: 337

Crescentic Glomerulonephritis in association with Fibrillary Glomerulonephritis

Dr Mohammed Fadlallah

Helen, Campbell. Nithin, Bodapati. Judit, Sutak

Dr Mohammed Fadlallah

Biography
My name is Mohammed Fadlallah . I am specialty registrar in renal medicine , year Six. Currently i am working in Southmead Hospital , NBT nhs trust. I studied medicine in Sudan. I worked in Republic of Ireland for four year before i joined training in renal medicine in UK. I have special interest in GN

Abstract

Crescentic glomerulonephritis is a major cause of rapid progressive glomerulonephritis(RPGN).
In other hand Fibrillary glomerulonephritis typically presents as hematuria, proteinuria and renal insufficiency , but rarely as RPGN. We report a 68- year old Caucasian female, known to be hypertensive, has Rheumatoid arthritis , and had Sarcoma twenty years ago. She presented with clinical picture of rapid progressive glomerulonephritis and high levels of Anti Glomerular Basement Membrane(Anti-GBM) antibody , ANCA was negative and there was no pulmonary hemorrhage. Initially she had three session of plasma exchange then had kidney biopsy . It showed cellular and Fibrocellular crescents , increase in mesangial area in light microscope. Possible weak focal IgG staining in membrane in immunohistochemistry. Then electron microscope showed deposition of fibrillary material in mesangum(width 8.8 nm) along the basement membrane and stained positive for DNAJB9. Blood tests for Cryoglobulin , Hep B and C and paraproteinemia were negative. Diagnosis was Crescentic glomerulonephritis in association of Fibrillary GN . Anti GBM positive is likely secondary to exposure of glomerular basement membrane by fibrillary GN. To our knowledge co existence of crescentic GN and fibrillary GN is rare. Electron microscope is important to identify the co existence of other glomerulonephritis in patients presented with glomerulonephritis.

Poster number: 156

Submission number: 392

Educating the future generation on blood, stem cell and organ donation and transplantation.

<u>Dr Frankie Dowen</u>[1], Ms Carrie Scuffell[1], Prof Derek Manas[1], Ms Nadia Martini[2], Mr Roydon Turner[3], Dr Alex Wood[4], Mr Benjamin Grant[5], Mr Harry Goodwill[6]

[1]Freeman Hospital, Newcastle upon Tyne. [2]Team Margot, London. [3]All Good Co., London. [4]Newcastle upon Tyne Hospitals, Newcastle upon Tyne. [5]NHS England, Newcastle upon Tyne. [6]Schools North East, Newcastle upon Tyne

Dr Frankie Dowen

Biography
Dr Frankie Dowen is a consultant nephrologist, with a special interest in renal transplantation, working at the Freeman Hospital, Newcastle upon Tyne. She is co-lead for transplantation in the NE and North Cumbria Renal Network and also leads on an International Society of Nephrology Transplant Sister Centre Programme with Kathmandu, Nepal. She is keen to promote organ donation and support communities and schools in delivering education on this to young people

Abstract

Introduction

In 2022-2023 there were 6,959 patients waiting for a transplant, an increase of 47% from the previous year. 439 patients died while on the active list waiting for their transplant compared with 429 in the previous year, an increase of 2%. In the same year, the total number of patients whose lives were potentially saved or improved by an organ transplant increased by 4% to 4,533[1]. Only 4.4% of registered donors are mixed heritage or ethnic minority [2], creating inequity in access to transplantation for those of mixed heritage or in ethnic minorities. In 2021, blood, organ and stem cell donation became part of the national curriculum for secondary schools in PSHE (Personal, Social, Health and Economic) Education for KS 3 and 4. NHSBT provide links to PSHE Education Association Quality Assured Resources, on their website, including lessons, an assembly and access to visiting speakers. However, we don't currently know how many schools are aware of these resources, and we acknowledge that this can be a difficult subject to discuss, with only 45% of parents in the UK feeling comfortable to talk to their children about organ donation[3]. There are many potential barriers to teaching the subject including cultural, religious, personal experience, parents/carers being unwilling for their children to receive education in this field, and teaching staff not feeling equipped to discuss the topic. There is a lack of data about what is being taught and whether there are inequalities in accessing information on this subject across the UK. We believe that starting conversations about blood and organ health and donation, transplantation and giving to help others, should start at an early age and develop through PSHE education in schools. Schools should be supported to deliver these messages in a positive way and have accessible, appropriate, tools in order to do this.

Methods

We created two electronic surveys, one for primary and one for secondary schools. These surveys ask schools to provide demographic information and ask about their awareness of current resources available, what, if anything, is being delivered at the school and what the school feel are the main challenges in teaching and discussing blood, stem cell and organ donation and transplantation. There are over 9 million pupils in schools in England[4] and this survey is being piloted in the North East of England, going out to over 1500 schools in January 2024.

We hope to be able to roll the survey out nationally to gain an understanding of the where and what we can do to support our schools in facilitating education on this lifesaving matter and reaching wider communities through our nation's young people.

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QI project to reduce waiting times for kidney transplant assessment by implementing a transplant referral checklist.

Mrs Tirion Honey, Miss Gemma Wellman, Mr Richard Powell

Plymouth Hospital Trust, Plymouth

Mrs Tirion Honey

Biography
Transplant nurse practitioner in Plymouth Hospital Trust. Previously, worked in the renal dialysis unit and the acute renal ward.

Abstract

Introduction:

Variability in the completeness of referrals to our unit in recent years has often led to delays in kidney transplant assessment, with a median waiting time of 144 days from initial referral to transplant listing. As part of the regional Kidney Quality Improvement Partnership (KQUIP) programme (April 2022-24) developed by the United Kingdom (UK) Kidney Association. We aimed to streamline the transplant referral process by creating a standardised referral checklist to ensure that all the required information is available at the point of referral.

 Methods/ case presentation:

We developed a SMART (Specific, Measurable, Achievable, Relevant and Time based) aim to improve the completeness of referrals from 45% to 90% by the end of the project. QI methodology including driver diagram and PDSA cycles were utilised and shared with the team. Data was entered into a regional dashboard which each referring unit could access in real-time. This included the number of referrals received and transplant listing per quarter (and proportion of pre-emptive patients), as well as the percentage of complete referrals, median eGFR at referral and the timeframe from referral to transplant assessment clinic and listing.

 Results/ outcome:

We have seen an overall improvement in the completeness of transplant referrals, with a reduction in discrepancy between centres from 40% to just 10%. The median waiting time from referral to listing has halved (79 days). Overall pre-emptive referral and transplant listing rates have improved to around 70% across the three referring centres to our transplant unit.

Discussion:

The introduction of a transplant referral checklist has led to a significant improvement in the completeness of transplant referrals to our unit, leading to improved waiting times and pre-emptive listing rates. This project has highlighted the improvement in communication and collaboration between renal units by using a standardised referral checklist, which could be adopted by other transplant centres in the UK.

Poster number: 158

Submission number: 173

Early post-transplant ureteric stent removal reduces the incidence of UTIs.

Emma-Louise Kent, Sophie Emmerson, Mr Fernando Yuen Chang, Ms Fiona McCaig, Mr Reza Motallebzadeh

London, Royal Free London NHS Foundation Trust

Emma-Louise Kent

Biography
I attended Bournemouth University and completed my BSc Adult Nursing degree in 2011 and proceeded to get my first job at Lister hospital working on a Renal Ward. Subsequently in 2017 I moved to the Royal Free hospital as a Junior Sister working on the general renal ward and renal transplant ward. I also gained experience as an acute inpatient dialysis nurse. In 2019 I started as a post renal transplant clinical specialist nurse where I conduct acute and chronic transplant clinics, as well as manage and run a nurse led stent removal clinic.

Abstract

Introduction: Early ureteric transplant stent removal has been shown to be associated with lower rates of urinary tract infections (UTIs). Our centre runs a nurse-led transplant ureteric stent removal clinic and aims to remove stents at 2-3 weeks post-transplant. We completed a cumulative audit to monitor the rate of UTIs post stent removal and the length of time transplant ureteric stents remain in-situ.

Methods: A prospective study from October 2018 to August 2023 collected key clinical data for all transplant patients having stents removed, including duration of the ureteric stent and number of patients with mid-stream urine (MSU) positive UTIs within 2 weeks post stent removal. We have compared the whole cohort with patients who developed a UTI, comparing the incidence of UTIs for patients with a stent duration of <3 weeks, 3-6 weeks and >6 weeks.

Results: Only 95 of 544 patients (17.5%) had stent removal within the 3 week target. Of 544 patients, 16 (2.9%) developed UTI within 2 weeks post stent removal, including 2 admissions for urosepsis. Rates of UTI increased with stent duration. Only 6.3% of patients with stents removed within the 3 week target developed UTI compared to 56.3% of those with stent removed at 3-6 weeks and 37.5% of the patients with stents removed >6 weeks and (figure 1). No patient with UTI and stent removal >6 weeks had End Stage Renal Failure related to reflux or bladder issues which are recognised predisposing factors to UTI. The median duration of the stent removal is 30 days for the full cohort, compared to 33 days for patients who developed UTI.

Comparison of full cohort with patients with UTIs post stent removal
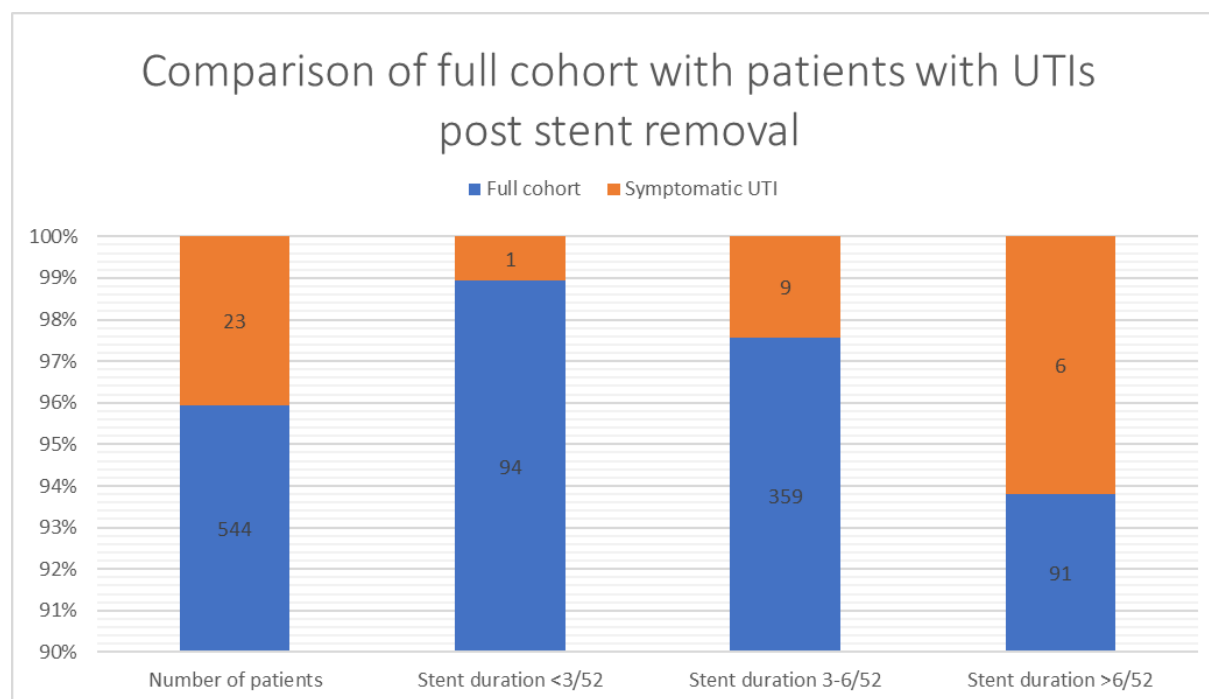
Discussion: These figures highlight that we are not meeting our 2-3 week stent removal target which is detrimental due to the markedly increased risk of UTIs associated with longer durations of stents in-situ.

Poster number: 159

Submission number: 196

Expansion of "REACH Transplant" initiative: Home based living donor kidney transplantation (LKDT) education for patients in Scotland - One Year On.

Mrs Orla Hobson, Dr Jen Lumsdaine, Mrs Linda White

Living Donation Scotland, Scotland

Mrs Orla Hobson

Biography
Renal nurse based in Edinburgh with ten years of renal and transplant experience. Currently leading the Scotland-wide expansion of REACH Transplant - a home based education initiative for patients who are likely to benefit from transplantation, aiming to increase the likelihood that patients will access living donor kidney transplantation, preferably pre-emptively.

Abstract

Introduction

REACH Transplant is a home-based education intervention for people who are likely to benefit from kidney transplantation. Home visits provide an opportunity for patients with end stage kidney disease (ESKD), along with members of their support network, to receive high-quality, tailored information about treatment options, in a relaxed environment. This approach aims to increase the likelihood of patients accessing living donor kidney transplantation (LDKT), preferably before starting dialysis where possible. It also aims to reduce the inequality of access to LDKT that is associated with socio-economic deprivation and belonging to an ethnic minority.

REACH Transplant was piloted in one Scottish renal unit between 2018 and 2020 and subsequently became part of the standard care pathway provided there. Scottish Government funding for the expansion of REACH Transplant across all nine Scottish renal units was approved, and a Programme Lead was appointed in October 2022.

Methods

Ten newly-appointed REACH Transplant Nurse Specialists took up their roles between January 2023 and March 2023. All of the nurses are experienced renal/transplant nurses and most are combining their REACH Transplant role with, for example, a Living Donor Transplant Coordinator or Vascular Access Nurse role. An extensive induction programme, combining group and individual educational activities and shadowing opportunities was provided. In addition, there are ongoing as opportunities for further learning, reflection and team building, which is particularly important for a team of geographically remote professionals, each working to develop a new service in their own area.

Patients who are suitable for a REACH Transplant home visit (*i.e.* likely to require renal replacement therapy (RRT) in the coming two years and likely to be suitable for kidney transplantation) are identified through:

(i) referrals from clinicians (e.g. nephrologists, CKD nurses, transplant team), and

(ii) using patient information management systems to identify patients who are potentially suitable and then checking with the named nephrologist whether it would be appropriate to offer a home visit.

Results

Since REACH Transplant Nurse Specialists have taken up their posts, home visits have been undertaken at the homes of 258 potential kidney transplant recipients, across all nine Scottish renal units. These patients have been accompanied by 471 additional invitees.

Discussion

Records of the home visits include details such as the patients' sex, ethnicity, renal replacement therapy (RRT) status, Scottish Index of Multiple Deprivation (SIMD), number of invitees present etc. Analysis of these records indicate that home visits have been undertaken in the homes of patients who are representative, in terms of ethnicity and socio-economic status, of the population of renal patients in their respective health boards.

The evaluation strategy that has been piloted for REACH Transplant is based on a rolling measurement of the proportion of the "target population" that have been offered a home visit. Where this evaluation strategy has been implemented successfully, month-on-month improvements have been observed.

In addition to the above, a small-scale pilot of a patient satisfaction survey was carried out in one renal unit, which received overwhelmingly positive feedback.

The next steps for REACH Transplant are to continue to collaborate with colleagues to embed this initiative in the standard care pathways in all Scottish renal units and to continue to evaluate its progress and impact in terms of increasing access to LDKT and pre-emptive LDKT as well as reducing inequality of access to this optimal treatment.

Poster number: 160

Submission number: 303

An operational delivery network approach to specialist nursing recruitment in non-transplanting centres to improve access to transplantation

Mr Alastair Tallis[1], Dr Kerry Tomlinson[2], Dr Elizabeth Wallin[3], Mrs Catherine Stannard[4], Marie Atkins[5]

[1]UHCW NHS Trust, Coventry. [2]UHNM NHS Trust, Stoke on Trent. [3]UHB NHS Trust, Birmingham. [4]KQIP, UK Kidney Association. [5]University Hospitals Coventry and Warwickshire, Coventry

Mr Alastair Tallis

Biography
I am the Project Manager for the Midlands Kidney Operational Delivery Network; I started my NHS career as an Occupational Therapist and have worked in public and private practice before becoming a Project Manager. The Multi-Disciplinary Team (MDT) are the critical component to providing exceptional healthcare and I enjoy bringing together all members of the MDT to collaborate and improve Kidney Services for patients and their carers throughout the Midlands. In my spare time I enjoy spending time with my family, learning about space and the cosmos, reading and taking cold showers!

Abstract

Introduction:

There is unwarranted variation in access to pre-emptive transplant listing and living donor transplantation. The Access to Transplantation and Transplant Outcome Measures study (ATTOM 2016) provided qualitative evidence of the importance of specialist nurses. The Renal Getting it Right First Time report quantified the benefits of living donor co-ordinators in renal units and recommended that renal centres should have a dedicated transplant nurse specialist workforce. The RSTP and NHSE approach has reinforced renal networks as the foundation for quality improvement and the RSTP toolkit states that "There should be dedicated specialist nurses and transplant coordinator time available to ensure patient flow through the assessment pathway".

Methods

Our regional Kidney Network was invited to apply for funding as part of the NHSE annual project proposals. Our proposal detailed opportunities to improve transplant access alongside patient experience and sustainability.

Dialysis costs are conservatively £10,000 more than transplant per annum. Each additional living donor transplant therefore saves £10,000 per annum for the life of the transplant. Each listing brought forward by 6 months saves £5,000 and possibly more given the cost of surgical procedures to initiate dialysis. Using the renal registry report 2019 looked at the numbers of patients starting kidney replacement therapy (KRT) who were listed or pre-emptively transplanted. We estimated the numbers

of patients moving to best practice care if units moved to the national average (20%) or regional best (26%) for pre-emptive listing. Estimating £7,500 per additional patient potential savings amounted to **_£226K-£653K_** across the region per annum. This compared favourably with project costs estimated at £200,000 per annum (4.5 WTE nurses).

Results/outcomes:

NHSE approved the funding, and all non-transplanting centres were asked for expressions of interest. The network supported recruitment by developing job descriptions, person specifications and monitored timescales.

Six nurses were recruited between November 2022 and June 2023. They have been supported by an education webinar programme from across the region and links with transplant centres. The nurses are supported to meet regularly virtually and share their experiences.

The network and KQIP are supporting a QI project within the region. We have asked units to collect data on transplant listing and access to living donation which we hope to track to show the effect of appointing these nurses in addition to other QI measures. Fig 1 shows pre-emptive transplant listing for the region compared to a unit who have had a CNS appointed.

Discussion:

We have shown that a network can successfully make the case to appoint specialist nurses where individual Trusts have been unable to do so. Over the next 2 years we will review the impact of these posts using qualitative outcome and patient experience measures.
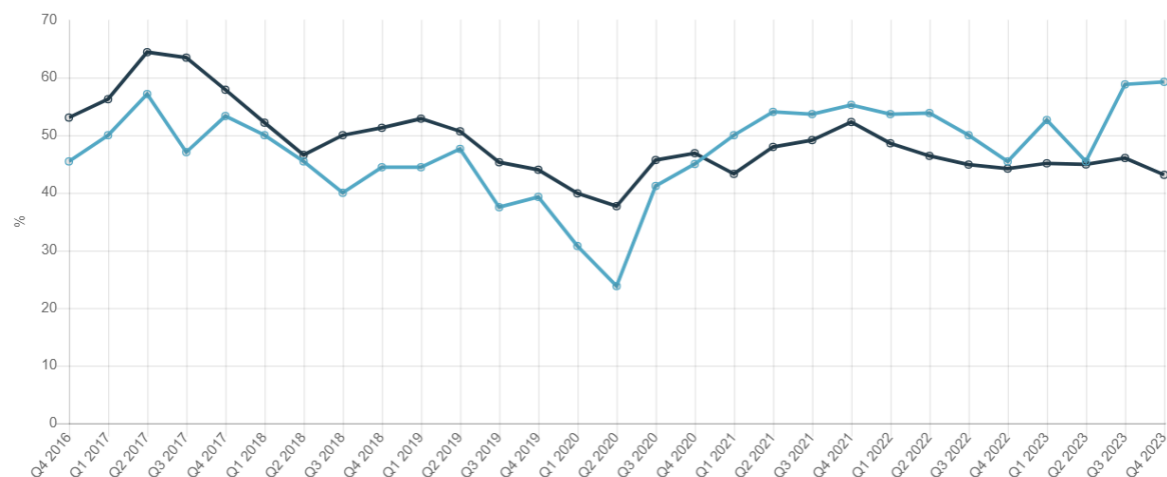
Fig 1 12 month rolling pre-emptive transplant listing rates in region (navy) and unit with transplant CNS appointmnet (blue)

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Layout 1 (gettingitrightfirsttime.co.uk)

Poster number: 161

Submission number: 433

Transplant Patient Report Experience Measure (TPREM); capturing patients' experience of the transplant workup pathway

Mr Alastair Tallis[1], Mrs Catherine Stannard[2], Dr Kerry Tomlinson[3], Marie Atkins[4]

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Mr Alastair Tallis

Biography
I am the Project Manager for the Midlands Kidney Operational Delivery Network; I started my NHS career as an Occupational Therapist and have worked in public and private practice before becoming a Project Manager. The Multi-Disciplinary Team (MDT) are the critical component to providing exceptional healthcare and I enjoy bringing together all members of the MDT to collaborate and improve Kidney Services for patients and their carers throughout the Midlands. In my spare time I enjoy spending time with my family, learning about space and the cosmos, reading and taking cold showers!

Abstract

Introduction: Patient reported experience measures (PREM) are a vital part of monitoring services and care quality.

KQIP (Kidney Quality Improvement Partnership) have worked with regions undertaking the Transplant First QI project to produce a TPREM.

Methods: In 2019 the KQIP Transplant First team adapted the UKKA/KCUK national Kidney PREM and sought feedback from patients. Post–covid we piloted a revised version in our region.   23 responses were returned in the pilot collection. A final version including 19 questions covering ten themes of experience (with 1 reporting worst experience, 7 reporting best experience) was agreed and rolled out across the network.

Results:

70 surveys were returned from three transplanting centres and four referral centres in the first quarterly collection.

In the main, respondents are reporting a very positive experience, with no theme's average score falling below 6 out of 7 [figure 1].

Regionally, the lowest scoring questions are:

- Patient information - During your workup, did you know where you were in the process and how long it might take? (6.31 / 7)
- Recipient information - Were you given any support to discuss living kidney donation with friends and family? (6.31 / 7)
- How the renal team treats you - "Thinking about how the kidney team treats you, do you feel any concerns you have are taken seriously?") (6.37 / 7).

The highest scoring question was:-

- Privacy and Dignity - Was your dignity respected during visits and clinical examinations? (6.92/7).
- This question also had the smallest range of experience, with no-one scoring lower than 6 / 7.

Whilst still positive, there appears to be a slightly less good experience of care in transplanting units (Overall experience 6.41 / 7) as compared to kidney (referral) units (Overall experience 6.75 / 7) [figure 2].

Discussion:

We have a TPREM in use in our region which has undergone cycles of testing in patients and is now informing us as part of our QI project. Individual units distribute the TPREM and return responses to the network team, these are collated into a quarterly regional overview with feedback to units including free-text comments from patients on their experience of the work-up process.

The organ utilisation group (OUG) in conjunction with the department of health and NHS BT has recommended the routine use of PREMS and our TPREM is well placed for further evaluation and wider adoption.

Figure 1

Regional average by theme

Theme	Score
Privacy and dignity (Q15)	6.92
Tests (Q12)	6.71
Access (Q1)	6.69
Scheduling (Q16)	6.63
Communication (Q3)	6.60
Patient information (Q4-7)	6.60
Support (Q2)	6.57
Sharing decisions (Q13-14)	6.54
Overall experience (Q19)	6.53
Transplant recipient information (Q8-11)	6.38
Environment (Q18)	6.38
Treats (Q17)	6.37
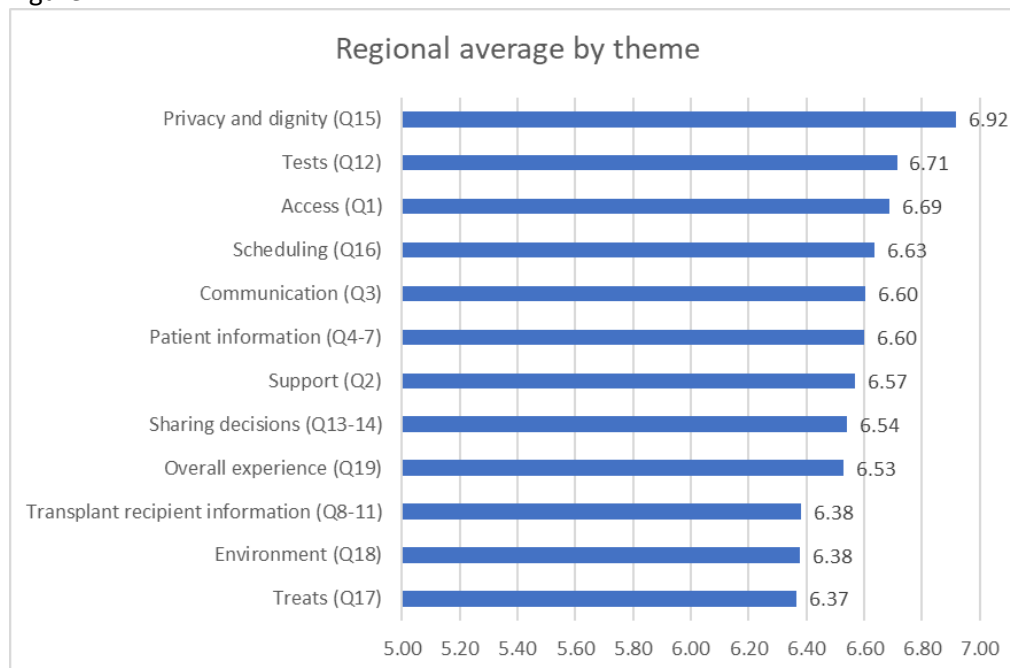
Poster number: 162

Submission number: 345

Improving post-transplant dermatology follow up and screening, A survey from Lister hospital Stevenage, UK

Dr Yasser Matter, Dr Zain Husain, Dr Md Ariful Hoque, Sister Ananda Manoj, Dr Shahid Chandna, Dr Sarah Fluck, Dr Gayathri Rajakaruna

Department of Nephrology ,Lister hospital, Stevenage , UK

Dr Yasser Matter

Biography
Renal Registrar , MBBS, MSc, MRCP(UK), ESENeph

Abstract

INTRODUCTION

Non-melanoma skin cancer is the most common cancer after a transplant, with over half of recipients having at least one case within 20 years. It has higher rates of recurrence and metastasis, leading to higher morbidity and death. [1-3]. Post-transplant care guidelines recommend annual dermatological screening, patient education, and chemo-preventative measures[4, 5]. The frequency of post-transplant skin cancer screening varies across centers. In Lister hospital Stevenage, we provide post-transplant follow up for patients in East and North Hertfordshire, South Bedfordshire and West Essex. Although the transplant care is centralized to Lister Hospital, the dermatology follow up can be spread across several hospitals. Therefore, we performed a survey in our post-transplant patient cohort, to determine the rate of screening, frequency of skin neoplasm and to determine patients' knowledge in order to improve the service.

METHODS

From December 2022 till April 2023, we carried out a survey (Appendix 1) in our renal transplant cohort to determine the post renal transplant skin surveillance rate. The survey was either by telephone (minimum two attempts) or by patient questionnaire at the transplant clinic visit. We did our analysis using Microsoft Excel version 2019. All data is presented in numbers and percentages.

RESULTS

The total patients' number was 455. 280 responded and 146 were non responders. We excluded 29 deceased patients (Figure 1). Only 83 patients (29.5%) were reviewed by dermatology team at least once. Majority of these were in Lister hospital (> 50% of the patients, Figure 2&3). There were 46 patients under annual surveillance. 37 patients were followed up either for malignant or benign conditions (Figure 4). Out of those 37 patients, 13 patients had malignant conditions. There were 5 patients with basal cell carcinoma (BCC), 1 patient with squamous cell carcinoma (SCC), 2 patients with

both and 5 patients with Bowens disease (Figure 5). Out of the responders, 221 patients, 79 % were educated on the standard post-transplant protective skin care precautions (Figure 6).

Discussion

Although it is clear that kidney transplant recipients should undergo routine skin surveillance, frequency of survey to balance early detection with finite resources remains a challenge for all care providers, which has been exacerbated following the COVID pandemic. We found that only less than one third of the renal transplant patients had the minimum annual screening frequency universally recommended by post-transplant care guidelines [5,6]. This is similar to other centers. Survey data from the US, France, and Canada shows, that less than a third of kidney transplant recipients regularly visit a dermatologist[7-9].

We hope to improve the access to the dermatology clinics by establishing formal links between the dermatology and transplant clinics to facilitate rapid access close to home. We aim to improve patient education by patients' information leaflets and brochures. As the next step to this project, we are aiming to set up meetings with local dermatologists to identify novel ways to empower patients to facilitate own screening and self-referral.

Figure.1

Total number of patients

- Non Responders — 146; 32%
- Responders — 280; 62%
- Deceased — 29; 6%

Figure.2

Renal transplants under dermatology follow up Vs no follow up

Figure.3

Place of dermatology follow up

Figure.4

Indication of dermatology follow up

Figure.5

Type of skin malignancy

Figure.6

Patients aware of the skin care precautions

59; 21%

221; 79%

Yes
No
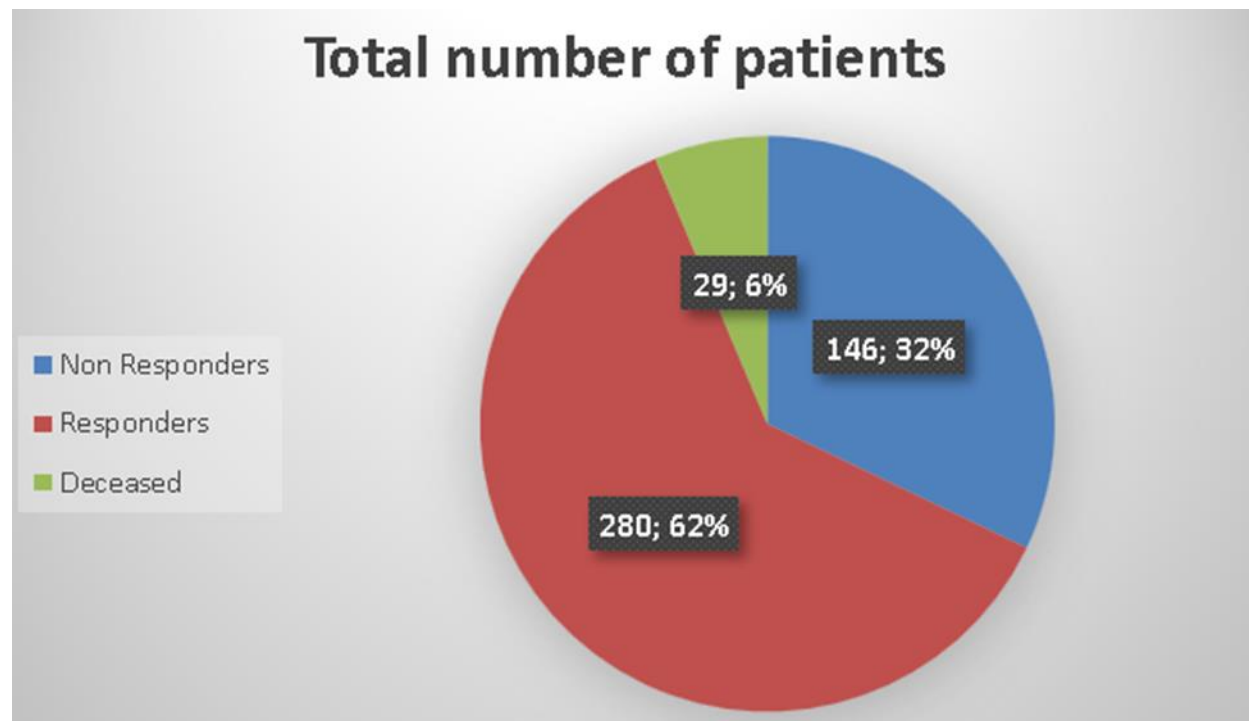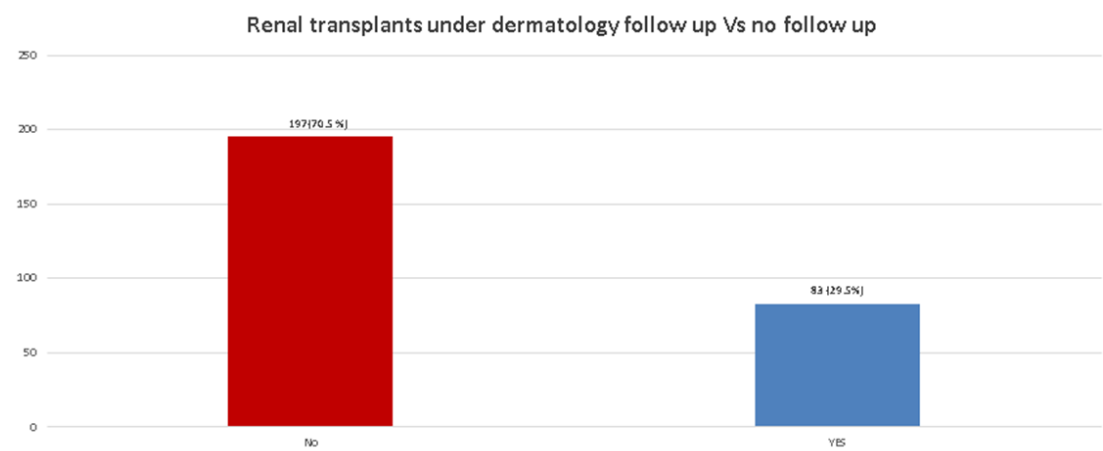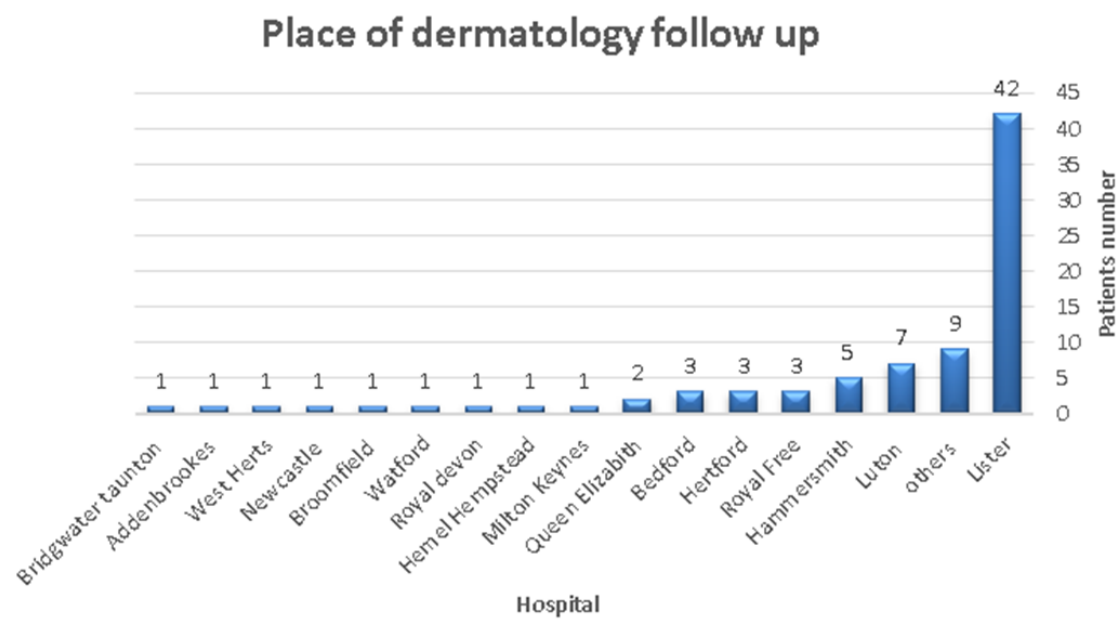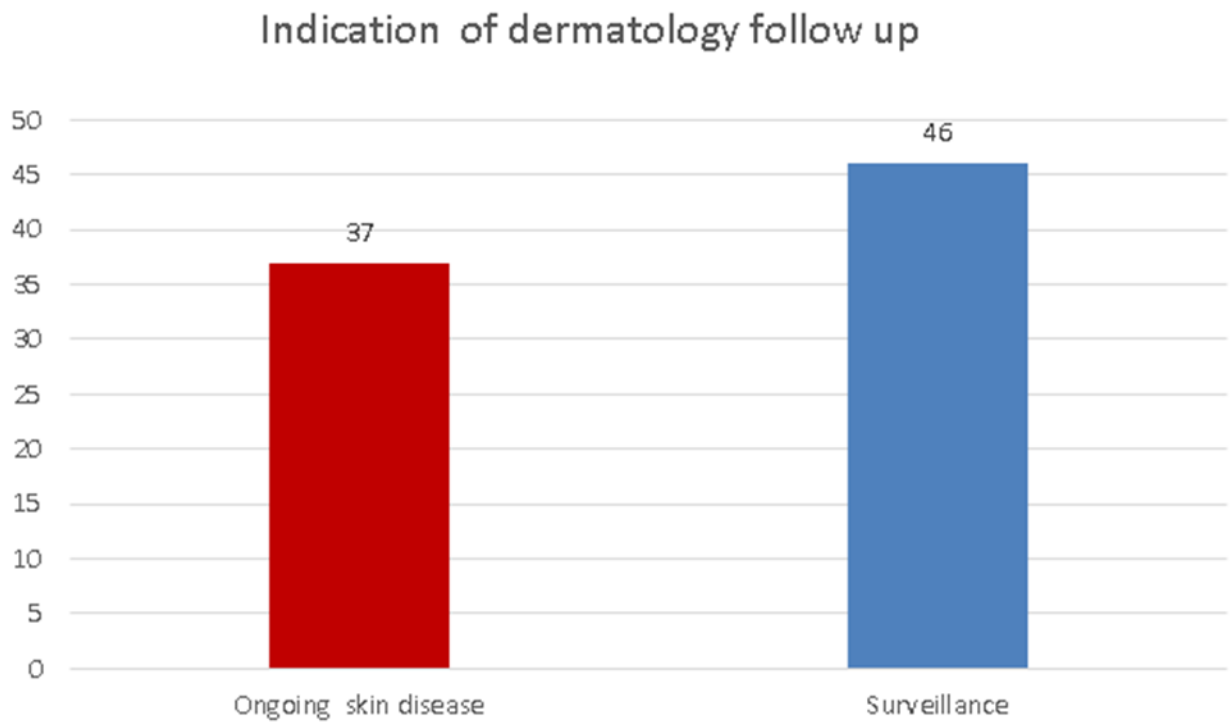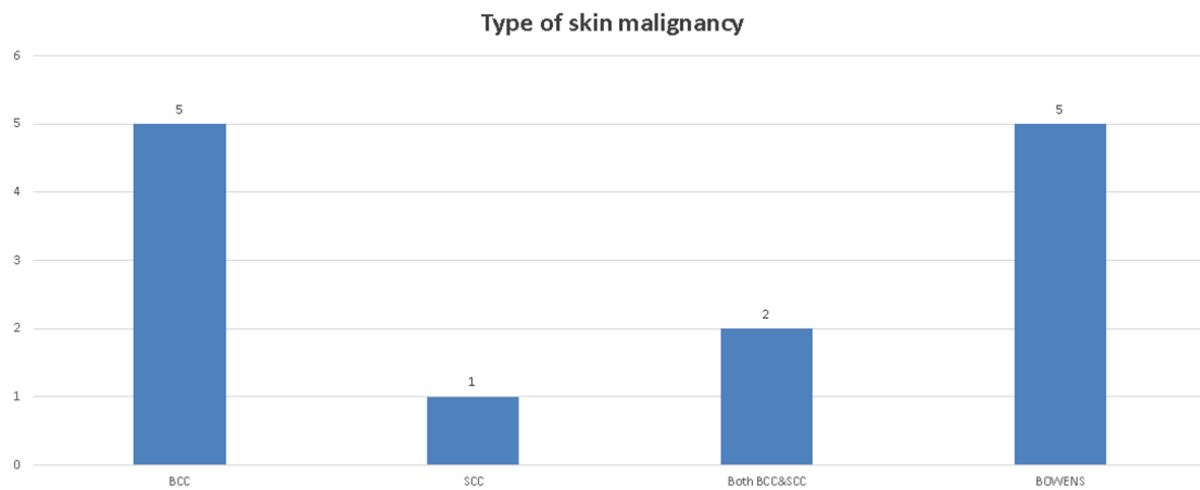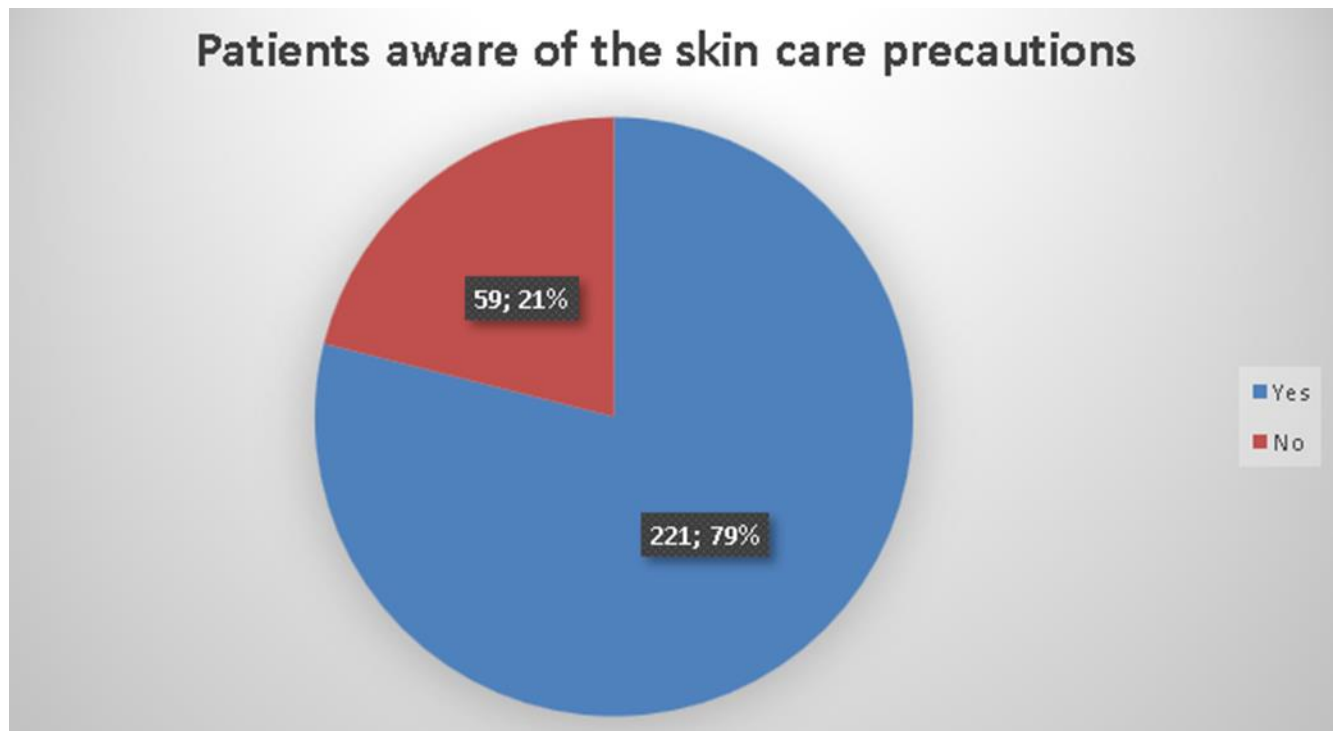
Appendix.1

Skin Survey for renal transplants

Name:

NHS Number:

Are you under dermatology follow up after the renal transplantation _? (Yes/No)

If **YES** where do you attend GP/Hospital (name of hospital?)

Is it surveillance or active problem?

IF active problem (benign/malignant-if malignant free text type BCC/SCC/Melanoma/Other)

Do you know about precautions for skin as a transplant patient liKe sunblock cream, avoiding long exposure to sun,, etc (Yes/No)

Any other comments

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Poster number: 163

Submission number: 349

Sensitivity and Specificity of DSE/MPS Scan in Pre-Transplant Cardiac Workup- A Single Centre Experience.

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[1]Renal medicine department., Birmingham UK. [2]Birmingham Heartlands Hospital, Birmingham UK

Dr Kanchan Pawan

Biography
My name is Dr Kanchan Pawan, I have done MBBS from Liaquat University of Medical and Health Sciences Jamshoro Pakistan. I got a GMC registration in October 2022, And I started working as a Junior Doctor (SHO) at University Hospitals Birmingham in June 2023. My future Goal is to pursue further training in NHS.

Abstract

Introduction:

This Quality Improvement Project aimed to investigate the sensitivity and specificity of the DSE/MPS scan in diagnosing cardiac Ischemia which is a crucial component of the pre-renal transplant cardiac evaluation. The validation process involved post-angiography assessments following positive stress echocardiography or myocardial perfusion scintigraphy scans. Additionally, we examined the impact of these diagnostic procedures on the ultimate transplant outcome.

Methodology and Data Collection:

The study utilized a retrospective data collection approach examining a cohort of 37 patients who underwent dobutamine stress echocardiography/myocardial perfusion scintigraphy scans as part of their cardiac workup. The data extraction involved a thorough examination of scan reports and clinical letters through the hospital's clinical portal.

Results:

In a cohort of 37 individuals, 18.9% (7 out of 37) tested positive for ischemia during DSE/MPS. Among all the 7 individuals with positive findings, 5 were male and 2 were female, with eGFR ranging from 9 to 20, and no previous myocardial events observed. All 7 patients underwent angiography. 57.1% (4 out of 7) confirmed positive for ischemia and undergoing angioplasty, while 42.9% (3 out of 7) were determined negative for ischemia upon angiographic examination.

Conclusion:

Our findings indicate that non-invasive DSE/MPS scans may not always accurately predict cardiac ischemia, as evidenced by angiographic discrepancies. However, the positive outcomes following angiography and angioplasty in patients with abnormal DSE scans underscore the value of these scans in the pre-transplant assessment process. These results led to either continued eligibility for transplantation or successful transplant procedures.

Discussion:

This study highlights the complex diagnostic pathway for cardiac ischemia in renal transplant candidates. While initial DSE and MPS screenings are vital for detecting potential ischemia, their limitations are evident when compared to angiographic results. Therefore, a comprehensive diagnostic approach that includes both non-invasive screenings and confirmatory procedures is recommended. Despite its retrospective nature and limited sample size, this study advocates for further research to optimize the diagnostic process in pre-transplant settings.

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Poster number: 164

Submission number: 356

Audit of outcomes following renal biopsy

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[1]none, N/A. [2]University of East England Medical School, N/A

Dr Prince Mtekateka

Biography
Graduated From Malawi College of Medicine in 2011 (Now called Kamuzu University of Health Sciences). Worked in Malawi as a Renal and Medical registrar before moving to the United Kingdom in 2017. Involved previously in one of the largest Community Acquired Acute Kidney Injury study in sub-saharan africa (MALAWI AKI STUDY) Has special interest in AKI, Low clearance, Haemodialysis, Glomerulonephritis and Renal Transplantation. Currently working as a specialty training registrar in Renal and GIM in the East of England Deanery.

Abstract

Introduction

The aim of the Audit was to assess incidence of complications following renal biopsy and acquisition of diagnostically adequate tissue.

Audit standards were complication rate <10% and adequate tissue > 85%.

Methods

We collected Data on all native and transplant biopsies arranged by renal team between 1st January and 31st December 2022.

Results

The commonest clinical indications for biopsy were acute kidney injury (35%) and nephrotic syndrome (18.3%). The most frequent histological diagnoses in native biopsies were Diabetic Nephropathy (14%), hypertensive nephropathy (13.2%) and IgA Nephropathy (11.4%).

In transplant biopsies the commonest diagnoses were recurrent IgA Nephropathy (23.5%), CNI toxicity (11.8%), Acute T-Cell Mediated Rejection (11.8%) and Ascending infection (11.8%).

Diagnostically adequate tissue was obtained in 96.9% of native and 93.8% of transplant biopsies.

Overall post biopsy complication rate was 8.8%. There was no patient who required embolization in intervention radiology. In our previous Kidney biopsy audit, two patients required embolization in intervention radiology.

Two (1.75%) patients had major complications post biopsy. One transplant patient required a nephrostomy for obstruction due to clot retention in the renal pelvis. Another transplant patient was re-admitted due to Sepsis secondary to infected haematoma. This was drained in interventional radiology.

Discussion

Post biopsy Complication rate met the Audit target and was similar to that described in literature.

Diagnostically Adequate tissue was obtained in more than 90% of Native and transplant biopsies. This exceeded Audit target of 85%.

There is no intervention that is required following this Audit.

Poster number: 165

Submission number: 103

Transforming the life of people with obesity and kidney disease, to enter the kidney transplant list: a quality improvement pilot project

Mr Bruno Mafrici[1], Mrs Anna Read[1], Mr Greg Stretton[1], Miss Brooke Kesic[2], Dr Emma Coyne[1], Dr Alastair Ferraro[1], Dr Charlotte Bebb[1]

[1]Nottingham University Hospitals NHS trust, Nottingham. [2]University of Nottingham, Nottingham

Mr Bruno Mafrici

Biography
Bruno is a renal dietitian working at the renal & transplant Unit at Nottingham University Hospitals NHS Trust. He is currently working as a renal dietitian non medical prescribers and he recently started his PhD with the University of Nottingham and Kidney Research UK. Bruno teaches at national lever to over 10 UK university to both undergraduate and postgraduate student and he is the authors and editor of the Pocket Guide to Clinical Nutrition. Bruno was the chair of the UK Renal Nutrition Group (2018-2022) and he continues to be involved with the UKKA.

Abstract

Introduction

Dialysis is a costly and resource-heavy treatment for people with kidney disease (Roberts et al 2022). Kidney transplant is a long term solution but one third of people on dialysis have a body mass index (BMI) above transplant requirement and struggle to lose weight due to extensive dietary and fluid restrictions, co-morbidities, reduced activity levels and often low mood (Oniscu et al 2021). Existing local weight management services are often unable to support complex patients with kidney disease whilst existing renal services do not often have the resources to provide the intensive and tailored treatment required. The aim of this project was to develop and implement a new multidisciplinary (MDT) kidney weight management service, dedicated to this target population.

Methods

A dietitian (0.4WTE), physiotherapist (0.2 WTE) and renal psychologist (0.2WTE) were funded (via the Nottingham University Hospitals Trust Charity) to run a weekly MDT clinic with tailored follow up offered to each patient medically fit to enter the transplant list but unable to do so because their elevated BMI (above 35kg/m^2). This clinic worked in collaboration with existing renal staff at our unit.

Upon initial assessment, patients had their BMI calculated and sit-to-stand 5 (STS5) test time and grip strength measured. They were also screened for depression (Patient Health Questionnaire, PHQ-9) and

anxiety (generalised anxiety disorder, GAD-7) and were asked to rate their perceived motivation for and knowledge of how to lose weight. Measures were repeated after six months where possible. Each patient was subsequently provided with an individualised treatment plan including a bespoke dietary plan, physical activity chart and psychological strategies.

Results

The pilot project ran from June 2022 until June 2023. Fifty patients (25 female; 25 male), mean age 52.1years (31-70 years) were referred to the service and 39 completed the project. Referral BMI ranged from 33 to 59.6 kg/m^2. The average weight loss was 4.78kg per patient with a range of +3.9kg to –23.7kg. Of the 39 patients that completed the project, 30 (76.9%) patients lost weight, 3 patients (7.7%) stayed the same and 6 (15.4%) people gained weight. Four patients (10.2%) achieved their target BMI to enter the kidney transplant waiting list, of which two patients successfully received their kidney transplant.

Patients with higher self-rated levels of motivation for weight loss were more successful at losing weight. High levels of depression and anxiety were observed using PHQ-9 and GAD-7 screening questionnaires. Improvements in the sit to stand test were observed in the majority of patients. Medical treatment for weight loss of very low calorie diets or obesity pharmacotherapy in the form of Orlistat were initiated for some patients who had not been able to lose weight, they were then able to achieve some weight loss.

Discussion

The preliminary data showed that a bespoke MDT service is effective in supporting renal patients to lose weight and in 12 months, four patients were entered onto the kidney transplantation list, two of which received a kidney transplant. This was a small, single centred and short-term project, therefore it is difficult to make large generalisation. More research is needed to establish its true efficacy, for wider populations as well as for Integrated Care Systems partners and from an economical view.

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Poster number: 166

Submission number: 354

Haemorrhage through a peritoneal catheter – a case report

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Dr Julian Delicata

Biography
Dr Delicata graduated as a medical doctor from the University of Malta in 2014. In 2023, he finished his Nephrology Specialist training. He has worked in Royal Free Hospital, London, for a year as part of his training and is currently a Resident Specialist in Mater Dei Hospital, Malta. He has a special interest in Metabolic Kidney Stone Disease.

Abstract

Introduction

Patients with polycystic kidney disease rarely present with severe, life-threatening haemorrhage from hepatic cysts. This case is particularly unusual as the patient had bleeding through a peritoneal catheter.

Case Report

We present a case of a 53 year old gentleman who presented to the Emergency Department with shoulder pain, hypovolaemic shock and significant bleeding through his peritoneal catheter. The patient had been on continuous ambulatory peritoneal dialysis (CAPD) for 30 months prior to presentation and his cause of end-stage kidney disease is Autosomal Dominant Polycystic Kidney Disease (ADPKD). He was known to have multiple large cysts in both kidneys and the liver.

An initial contrast-enhanced CT scan showed a dense fluid area 25 mm in diameter, suggestive of a haematoma, around the liver. The patient required admission to a High Dependence Unit, received four red cell transfusions and empiric intraperitoneal antibiotics and was managed conservatively. After 10 days, he was discharged back home, still on peritoneal dialysis. The peritoneal fluid was clearer but still blood stained.

The patient presented again to the Emergency Department a month later with severe right upper quadrant pain, right shoulder pain and bleeding from his peritoneal catheter. The patient was switched to haemodialysis via a right jugular tunnelled haemodialysis line and both right and middle hepatic arteries were embolised. The peritoneal catheter was left in place as it allowed us to monitor the bleeding.

After further episodes of haemorrhage through the peritoneal catheter, a dedicated CT scan of the liver showed new haematomas forming around the liver, as well as a 1.5cm pseudoaneurysm at the subdiaphragmatic surface of segment VII of the liver.

An angiogram was subsequently done via a right femoral approach which confirmed the presence of this pseudoaneurysm being supplied by the right inferior phrenic artery. Embolisation coils were placed in the pseudoaneurysm sac and in its feeding artery. Three days later, the peritoneal catheter was removed laparoscopically and a washout of the peritoneum was done, using a haemostatic agent, especially around the liver's surface.

Discussion/Conclusion

This case is extraordinary as haemorrhage from the liver (which is in itself not common in ADPKD) from a branch of the inferior phrenic artery is rare. Moreover, the patient had to be managed while undergoing CAPD with frequent episodes of bleeding noted through his peritoneal catheter.

We are happy to report that the patient is now established on haemodialysis and doing well, ten months after his first presentation.

Poster number: 167

Submission number: 360

Extra Medullary Haematopoiesis in renal allograft nephrectomy specimens.

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[1]Royal London Hospital, Barts Health NHS Trust., London. [2]Barts Health NHS Trust., London. [3]Whittington Health NHS Trust., London

Shahar Khan

Biography
I am currently working as renal specialist trainee at The Royal London Hospital, London. My interests are transplant nephrology and vasculitis specially IgA nephropathy and lupus nephritis.

Abstract

Introduction

Extra medullary haematopoiesis (EMH) is a recognised association with bone marrow disorders, chronic inflammatory states, haematological and some solid organ malignancies [1][2]. Typical sites for EMH are the liver and spleen, and less commonly skin, lung, gastric tissue, pericardium, and inflamed joints[1]. We describe two cases of EMH as incidental finding in renal allograft nephrectomy specimens.

Case 1

A gentleman in his late 30s with ESKD secondary to presumed hypertensive nephropathy and on haemodialysis for four years had a DBD renal transplant. He received Basiliximab as induction followed by maintenance Prednisolone, Tacrolimus and Mycophenolate Mofetil. He had stable graft function (serum creatinine 100-130 umol/L) until three years post-transplant when he developed raised purplish and red- brown nodules on bilateral lower limbs. Skin biopsy was positive for HHV-8 consistent with Kaposi Sarcoma (KS). Tacrolimus and MMF were stopped, and he was switched to Sirolimus resulting in successful clearance of the KS. Five months after the diagnosis of KS, he was admitted with deranged graft function (serum creatinine 2300umol/L). Allograft biopsy was consistent with Banff 3 T-cell mediated rejection (TCMR). A consensus decision was taken to perform graft nephrectomy as intensification of immunosuppression would have been associated with relapse of KS. Renal histopathology revealed islands of EMH, including erythroid and myeloid precursors on a background of cellular rejection on H&E section of the renal allograft explant. (Figure 1a,1b)

Figure 1a
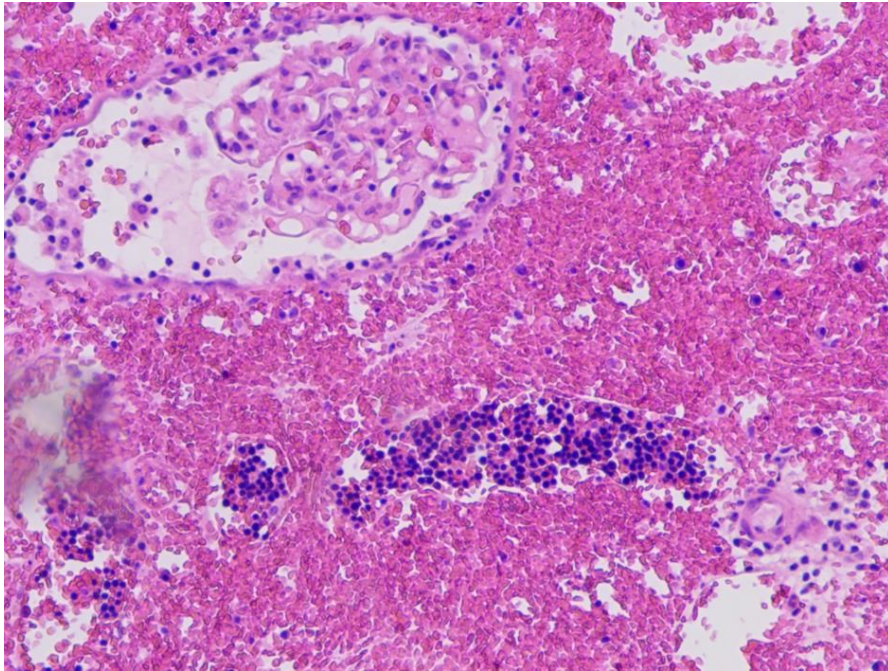
Figure 1b
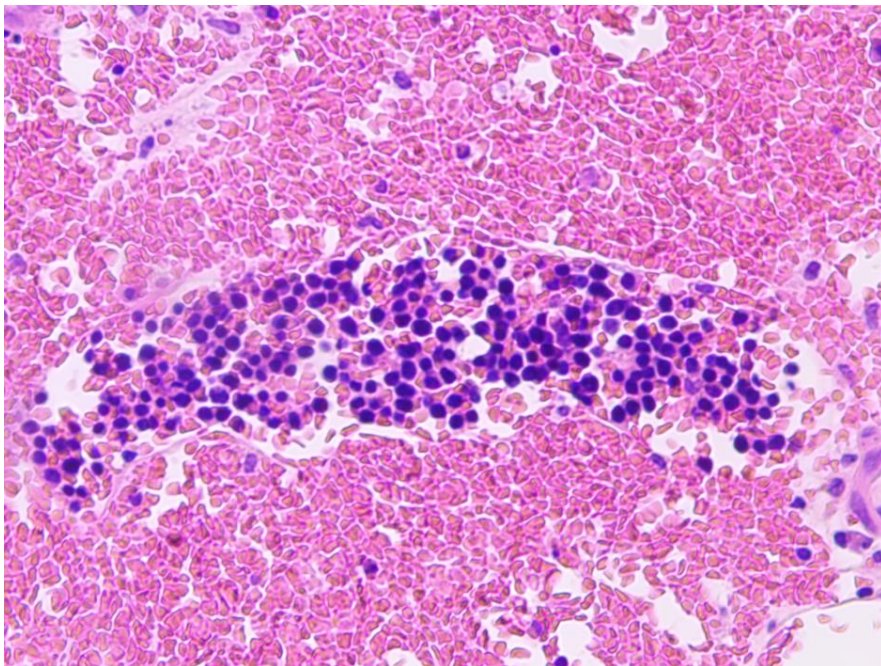
Case 2

A young female patient with ESKD secondary to biopsy proven FSGS (treated with ciclosporin A and cyclophosphamide) underwent a DBD renal transplant in paediatric care after four years on

haemodialysis (HD). Post-transplant course was complicated by delayed graft function and an early mixed rejection (treated with steroids and Rituximab) followed by late chronic antibody mediated rejection (ABMR). Graft function continued to decline, and she was re-established on HD two years post-transplant. She transitioned to adult nephrology care and underwent a second DBD renal transplant after three years on dialysis. She received thymoglobulin and plasma exchange (PEX) as induction therapy followed by triple immunosuppression. She had several rejection episodes treated with IV methylprednisolone, PEX and IV Immunoglobulins (IVIg). She had variable adherence with medications and had frequent admissions with severe chest and urinary tract infections. Due to her persistent inflammatory state and poor graft function (Figure 2a,2b), a consensus decision was taken to perform graft nephrectomy. Histology demonstrated islands of EMH, including erythroid and myeloid precursors on a background of severe cellular and humoral rejection on H&E section of the renal allograft explant. (Figure 3a,3b)

Figure 2a
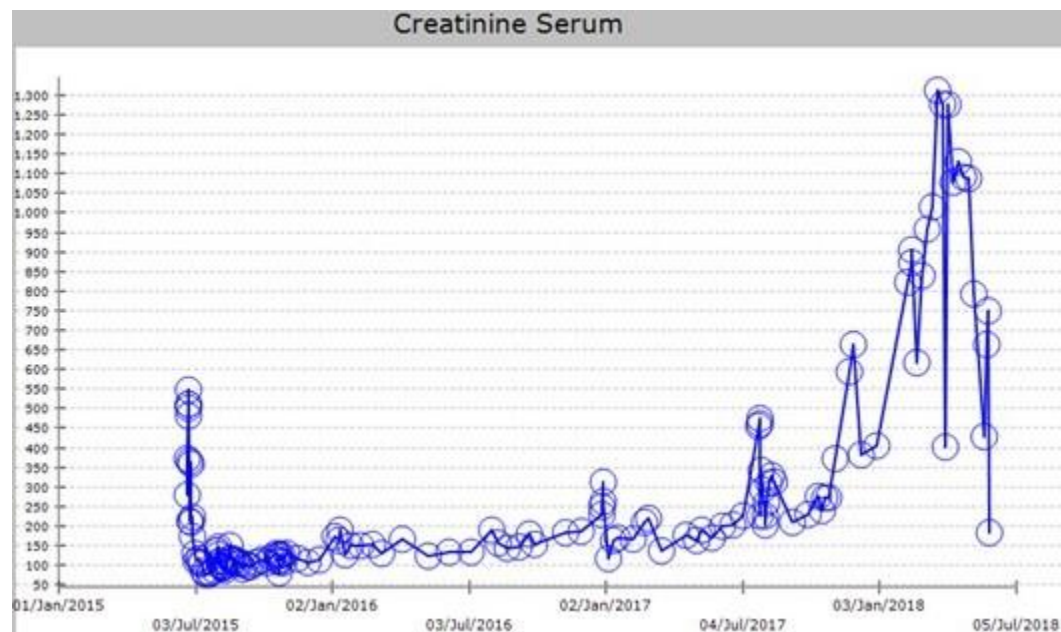
Figure 2b
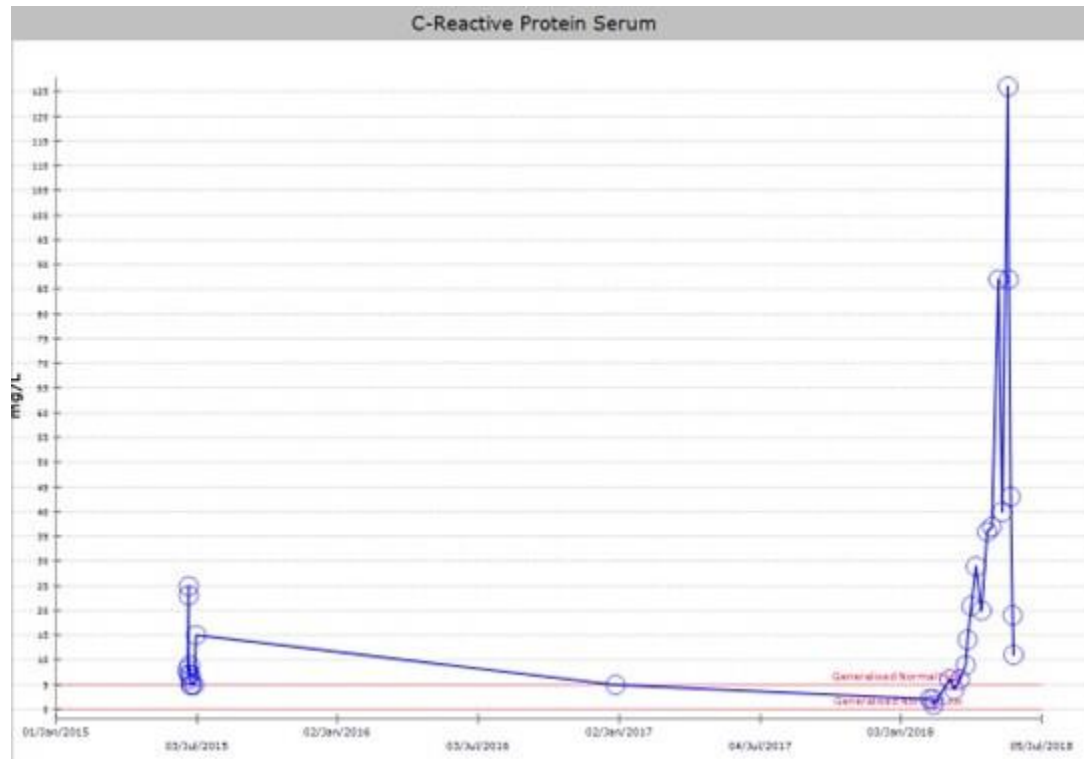
Figure 3a
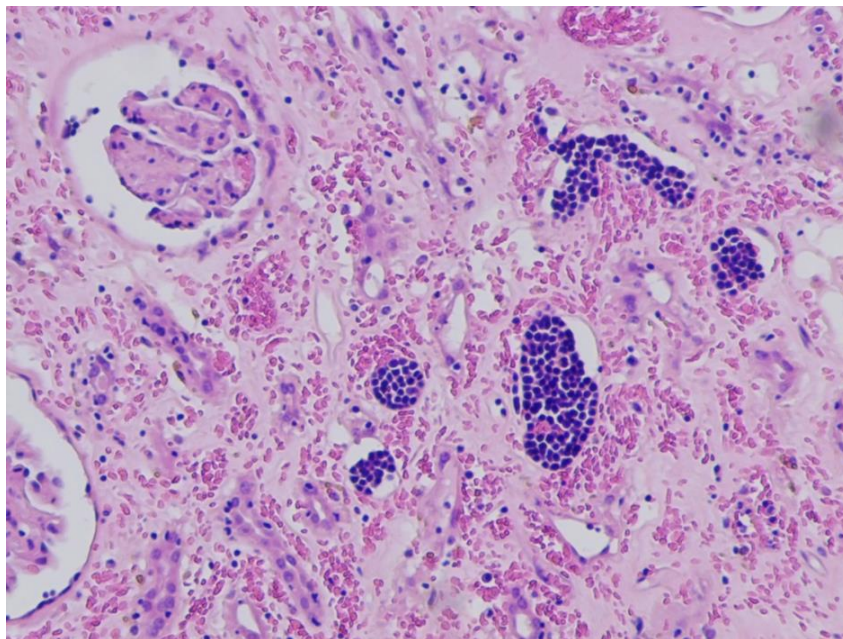
Figure 3b
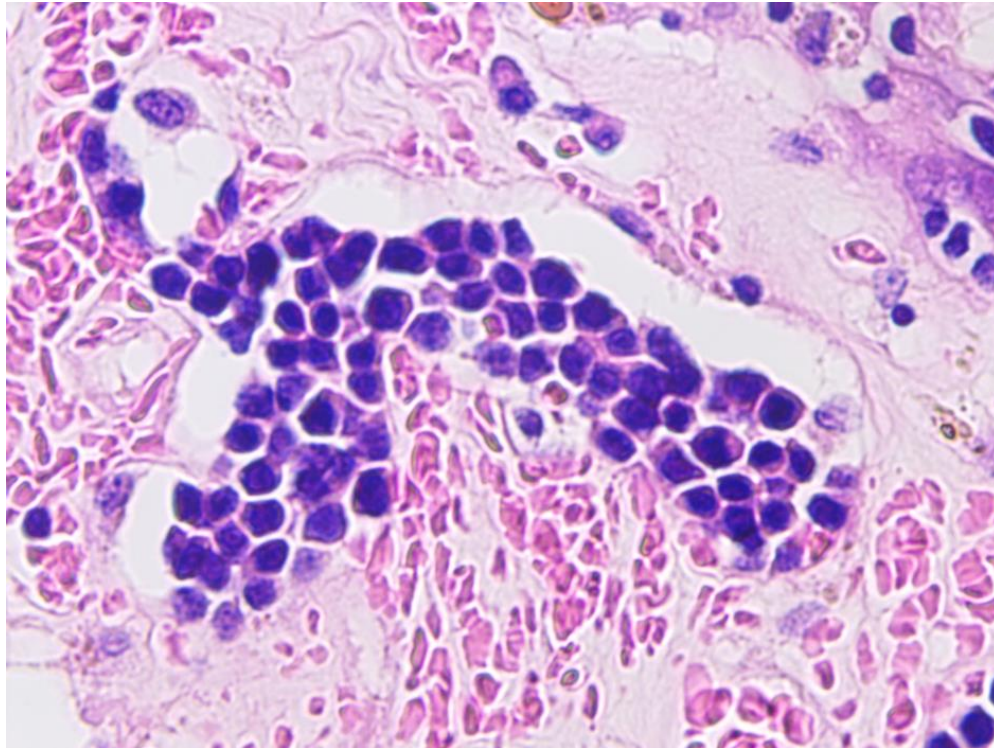
Discussion

EMH has been described in only a few case reports previously affecting native kidneys, frequently misdiagnosed as tubulointerstitial nephritis. Majority of the cases were treated for anaemia by exogenous erythropoietin. Our two cases are first to our knowledge to find EMH incidentally in graft nephrectomy specimens. Proposed mechanisms suggest haematopoietic stem cells are either derived from resident mesenchymal pluripotent cells or may arise from the migration of stem cells from the marrow and proliferate as a response to disease-related growth factor and intrarenal erythropoietin[3][4]. Clinically renal EMH can be asymptomatic but can present with mass effect or organomegaly. Treatment of symptomatic cases should focus on management of the driving disease process, excision and targeted radiotherapy.

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Poster number: 168

Submission number: 361

Clinical experience of Obinutuzumab in the management of ANCA vasculitis and membranous nephropathy

Dr Yasmina Abdelrazik[1], Dr Stuart Smith[1], Professor Lorraine Harper[1,2], Dr Dimitrios Chanouzas[1,3]

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Dr Yasmina Abdelrazik

Biography
Yasmina Abdelrazik is an academic foundation year 2 doctor at University Hospitals Birmingham NHS Foundation Trust. She graduated from Cardiff University School of Medicine in 2022. She also holds a First Class Honours in Medical education and is interested in both academia and in medical education.

Abstract

Introduction

Obinutuzumab is a type II humanised anti-CD20 monoclonal antibody. It offers an alternative to rituximab, the standard treatment for ANCA associated vasculitis (AAV) and membranous nephropathy (MN).[1,2] Obinutuzumab has been used off-label for patients with disease refractory to rituximab and those with a history of anaphylactic reactions to rituximab. In vitro research has suggested that it is more potent at inducing B-cell cytotoxicity than rituximab.[3] Currently there is scarce literature on efficacy of obinutuzumab in AAV and MN. This case series aims to review the use, efficacy and safety of obinutuzumab in AAV and MN.

Methods

A case series of AAV and MN patients that have received obinutuzumab in our centre. A search was conducted in the high cost drugs database for patients that have received obinutuzumab in the renal department since 2020.

Results

Eight patients were identified to have received obinutuzumab for AAV (n=6) or MN (n=2). All AAV patients were initiated on obinutuzumab due to having non-remitting disease that was refractory to rituximab. Of these, 3 patients had also received cyclophosphamide with again failure to achieve remission. Therapies received prior to obinutuzumab are summarised in Figure 1. AAV patients had predominantly severe head and neck disease. The main disease manifestations were: subglottic stenosis (n=3), severe nasal cavity inflammation (n=2) and intracranial inflammatory lesions (n=1). Five patients

were PR3-ANCA positive. All AAV patients screened (n=5) had no detectable peripheral B cells prior to commencing obinutuzumab treatment. Three out of the six AAV patients treated with obinutuzumab had a very good response to treatment and have been maintained in remission with 6-monthly obinutuzumab infusions. The other three AAV patients treated with obinutuzumab have tolerated the treatment well. Data on treatment efficacy for these patients are awaited. There has been a trend towards reduction of PR3 titres following obinutuzumab treatment as shown in Figure 2. The MN patients were initiated on obinutuzumab due to severe allergic reactions to rituximab. Both patients are now in remission following obinutuzumab induction. One patient who was PLA2R positive is now antibody negative. No AAV or MN patients reported adverse side effects.

	GC	MP	RTX	CYC	PLEX	Ig	MTX	MMF	AZA	AVP
P1	✓	✓	✓	✓		✓		✓		X
P2	✓	✓	✓	✓	✓*		✓	✓		X
P3	✓	✓	✓	✓	✓			✓		✓
P4	✓		✓						✓	✓
P5	✓		✓	OP			✓			
P6	✓		✓	✓						

Figure 1- A summary of therapies received by patients prior to Obinutuzumab

AVP, Avacopan; AZA, azathioprine; CYC, cyclophosphamide; GC, glucocorticoids; MP, intravenous methylprednisolone; Ig, immunoglobulins; MMF, mycophenolate mofetil; MTX, methotrexate; OP: opted out; RTX, Rituximab; X, no availability due to supply issues; *, started with Obinutuzumab at the same time
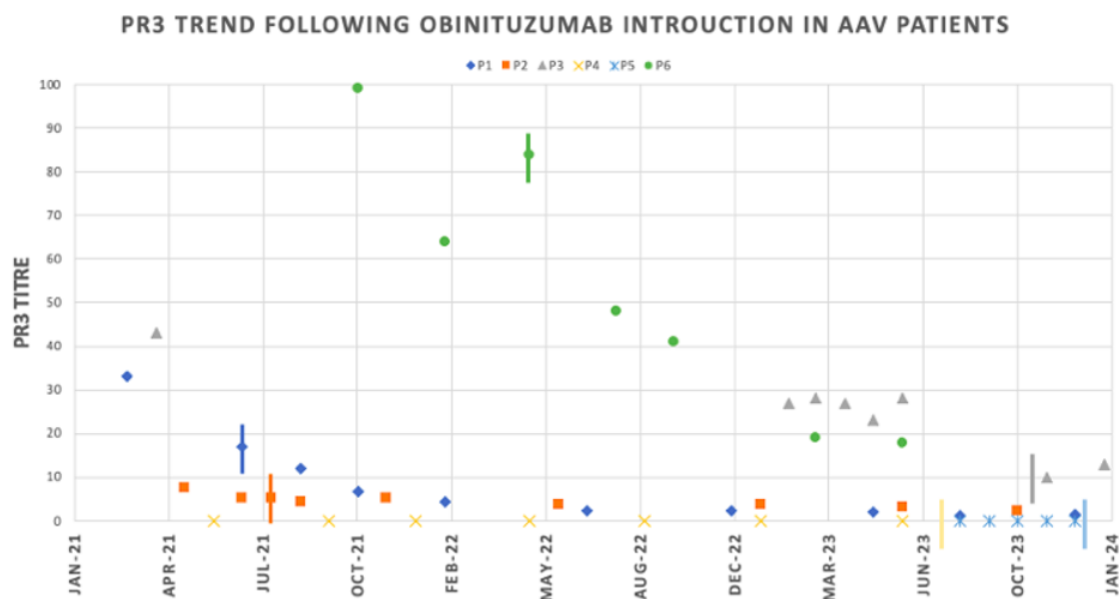
Figure 2- The trend of PR3-ANCA before and after the introduction of Obinutuzumab

Discussion

Our experience suggests that obinutuzumab is an effective alternative to rituximab. It was well tolerated amongst patients who had anaphylactic reactions to rituximab and successfully induced and maintained

remission in MN and refractory AAV. Therapeutic benefit was obtained despite AAV patients being peripherally B-cell deplete. This suggests that there may be niches of disease activity in the body where obinutuzumab may have superior efficacy compared to rituximab in depleting pathogenic tissue B-cells[3-4].

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Poster number: 169

Submission number: 369

Anaemia- thinking beyond the obvious.

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[1]Norfolk and Norwich University Hospital NHS Trust, Norwich. [2]Cambridge University Hospitals NHS Foundation Trust, Cambridge

Dr Meheli Chatterjee

Biography
I am currently in the 3rd year of my Internal Medicine training and keen to pursue Nephrology in the long run.

Abstract

Background:

Paroxysmal nocturnal haemoglobinuria (PNH) is a rare clonal hematopoietic stem cell disorder characterized by the absence of glycosylphosphatidylinositol (GPI)-anchored proteins, particularly CD55 and CD59. This deficiency leads to uncontrolled complement activation, resulting in hemolysis, cytopenias and other complications such as arterial and venous thrombosis, acute and chronic renal impairment, pulmonary hypertension, etc. This case report focuses on a patient who presented with distinct features of PNH, but complications ensued due to lack of suspicion of a rare diagnosis like PNH, emphasizing the risks associated with delayed diagnosis and significance of considering rare pathologies in clinical evaluation.

Clinical presentation:

A 22 year old lady presented with fatigue, exertional dyspnea, and severe anemia, necessitating admission and blood transfusion. She was discharged after being reviewed by Acute Medicine team and menorrhagia was initially suspected as the cause of her symptoms. However, her second admission which shortly followed, was initially under Urologydue the nature of her presentation, but transferred to Nephrology later when she developed stage 3 acute kidney injury (AKI) within 72 hours, despite normal baseline kidney functions. A CT scan of the urinary tract revealed no structural defects. Kidney biopsy was organised as part of investigation of cause of the AKI. The persistence of anemia, along with cola-colored urine and AKI, prompted a PNH screen, but before results could arrive, her renal functions deteriorated significantly, leading to the initiation of hemodialysis through a temporary central venous access. Haematologists were involved in her care.

Flow cytometry results unequivocally suggested an underlying PNH diagnosis. Following the initiation of treatment with Eculizumab, a monoclonal antibody that inhibits complement activation, renal function

rapidly improved. The patient's native kidney function was adequate to discontinue hemodialysis before discharge.

Conclusion:

This case underscores the rarity of PNH as a cause of intravascular hemolysis and the critical importance of a high threshold of suspicion for its timely diagnosis. The delayed identification of PNH can lead to severe complications such as the severe AKI in our patient ,necessitating high risk procedures such as kidney biopsy and urgent renal replacement therapy. However, prompt diagnosis and intervention, exemplified by the initiation of Eculizumab, not only reversed the acute complications but also allowed for the discontinuation of renal replacement therapy.

We intend to highlight the broader implications of timely PNH diagnosis on overall morbidity and mortality, with the help of this case. Early recognition can prevent complications, reduce the need for invasive interventions like hemodialysis, and significantly impact the patient's long-term prognosis. This report serves as a reminder to clinicians about the importance of considering rare disorders like PNH in the differential diagnosis, particularly when faced with unexplained hemolysis and associated complications.
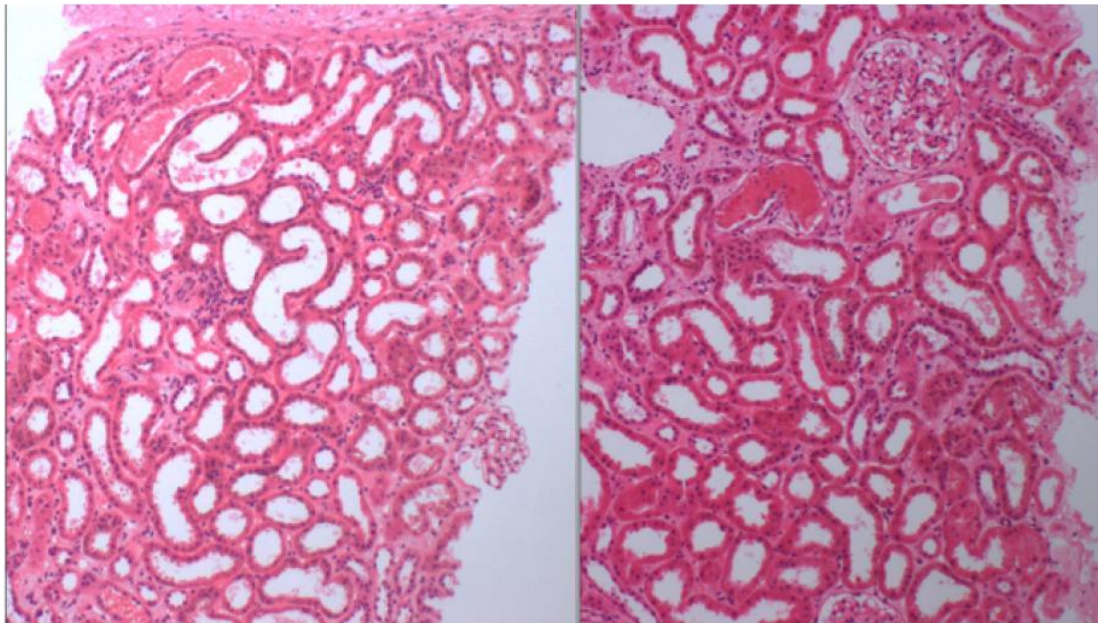
Fig: Haematoxylin and eosin stain of the kidney biopsy eosinophilic material in tubules (haemoglobin cast), minimal evidence of tubular atrophy or sclerosis
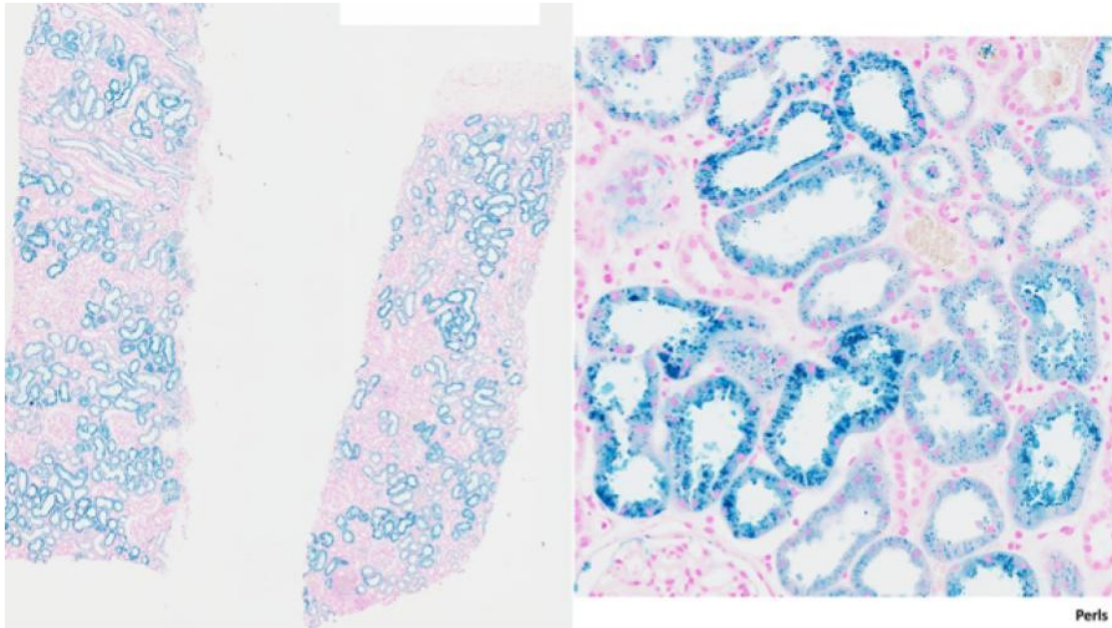
Fig: Prussian blue stain showing abundant haemosiderin deposition in tubular epithelial cells

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Poster number: 170

Thalidomide treatment for refractory blood loss due to small bowel vascular ectasia in a haemodialysis recipient

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[1]Renal Unit, Nottingham. [2]Department of Gastroenterology, Nottingham. [3]Renal and Transplant Unit, Nottingham

Dr Matt Hall

Biography
Nephrologist at Nottingham University Hospitals

Abstract

Introduction

Gastrointestinal (GI) vascular ectasia is characterised by telangiectasia in gastric and intestinal lumen leading to blood loss and iron deficiency anaemia. It is more common in patients with connective tissue diseases, liver disease and in patients with established kidney failure. Milder episodes may be self-limiting and managed with iron supplementation. More severe episodes can be treated endoscopically with argon plasma coagulation and/or endoscopic band ligation if limited to the stomach. Here we present a case report of severe small bowel vascular ectasia that responded to treatment with thalidomide.

Methods

Retrospective case review.

Case details

A 67 year old male had received haemodialysis for 4 years due to renal vascular disease. He did not receive antiplatelet or anticoagulation agents other than intravenous enoxaparin during dialysis sessions.

From February to June 2023 a slow drop in haemoglobin was noted from 106g/l to 65g/l despite a 4-fold increase in epoietin alfa and regular supplemental intravenous iron (figure). The patient was asymptomatic. Upper GI endoscopy was initially declined. Lower GI endoscopy was unsuccessful as an out-patient due to inadequate bowel preparation. Two units of packed red blood cells were transfused on four occasions within a month without impact on haemoglobin and the patient agreed to hospital admission.

Upper and lower GI endoscopy were subsequently performed confirming gastric antral vascular ectasia. The duodenum appeared normal. No lower GI bleeding points were seen. Endoscopic band ligation was performed 4 days later.

Overt melaena developed. Packed red cell requirement subsequently increased from 2-4 units per week to 8-10 units per week to maintain haemoglobin 60-70g/l. Lanreotide 60microg sc was administered. Capsule endoscopy was requested and confirmed extensive telangiectasia in the small bowel.

Thalidomide 100mg daily was commenced. Melaena settled within 72 hours. Transfusion requirement reduced and the patient was discharged. On-going anaemia necessitated proactive transfusion of 2 units packed red cells per week for 13 weeks. A total of 76 units had been required.

After 4 months' therapy with thalidomide, transfusion-independence was achieved.
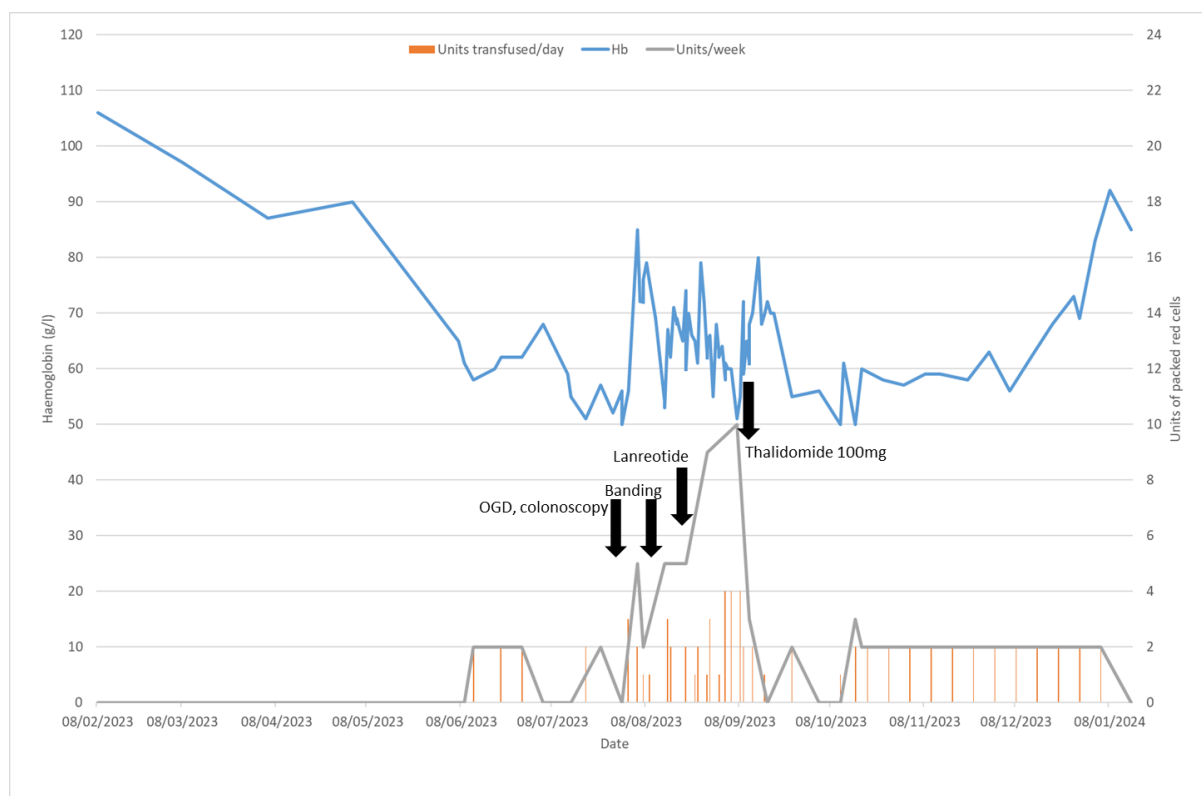
Discussion

Gastrointestinal vascular ectasia is a potentially life-threatening complication of established kidney failure. There is paucity of randomised trial evidence to support pharmacological treatments when endoscopic options are not feasible. Reported options include targeting submucosal capillary dilatation (ocretotide, lanreotide, cyproheptadine), plasminogen (tranexamic acid) and endothelial growth factors (bevacizumab, thalidomide). The effectiveness of thalidomide is usually apparent after 3-4 months' therapy and may remain effective for up to 12 months after discontinuation.

Our case demonstrates the effective use of thalidomide to control life-threatening GI bleeding due to vascular ectasia in a haemodialysis recipient.

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Poster number: 171

Submission number: 401

EBV-related Myeloperoxidase specific antineutrophilic cytoplasmic associated vasculitis with renal and neurological involvement: An unusual triad

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John Walls Renal Unit Leicester General Hospital, Leicester

DR Yusuf Jinadu

Biography
Specialist registrar In Nephrology and GIM with intrest in transplantation, Glomerulonephrits ,Vasculitis and interventional Nephrology.

Abstract

Introduction:

The aetiology of ANCA-associated vasculitis remains unclear. An interaction between infection and autoimmunity has been postulated as a trigger for ANCA-associated vasculitis. Infections with EBV tend to be associated with autoimmune diseases, such as vasculitis linked to antineutrophil cytoplasmic antibodies (ANCA). (1)

During infections, autoantibodies are generated in particular anti myeloperoxidase (MPO) antibodies although not all have the potential to induce vasculitis. MPO-positive vasculitis diseases are more frequently linked to symptoms that are cutaneous, pulmonary, and renal and there have been cases with predominantly neurological manifestations.(2)We describe a case of ANCA-associated vasculitis with EBV viraemia with predominant renal and neurological manifestations with initial presentation as pyelonephritis.

Methods

 A 75-year-old man presented to the emergency department with increasing generalised weakness, and poor mobility a week before symptoms of flank plan, urinary tract symptoms, and fever. Prominently he reported reduced oral intake reduced urinary output and high-grade fever. There was no report of upper or lower respiratory tract symptoms. The initial working diagnosis was pyelonephritis and was commenced on antibiotic treatment. An initial urine dipstick on admission was positive for Protein (+), Blood (+++), leukocytes (+), and urine cultures growing Escherichia coli. Cross-sectional imaging of the renal tract showed features suggestive of a left-side pyelonephritis

Subsequent while on admission neurological examination revealed acute right-sided weakness, CT head performed which showed mild small vessel disease with lacunar infarcts. His care was transferred to the neurological team and an MRI of the brain requested showed an acute infarct of the left lentiform nucleus, left insular microbleed, and a subacute left inferior parietal lobe infarct. Follow-up

investigations showed worsening of his kidney function with an increased urine protein creatinine ratio (Urine PCR). Despite initial empirical antibiotics, his inflammatory markers were persistently elevated and a further extended infection workup including a viral screen showed an EBV PCR titre value of 20,095iu/ml (reference range. Serology for Hepatitis virus, HIV, and extended immunological screen were negative. Subsequent acute kidney injury work-up revealed MPO -ANCA levels with titre values of 221.9iu/ml. A kidney biopsy was considered during the illness but due to being anticoagulated as part of a stroke protocol and unlikely change to treatment. Due to the risks outweighing the benefits, a planned biopsy was held.

Results

Initial treatment included a course of pulsed methylprednisolone (followed by a tapering dose of prednisolone), and rituximab 1000mg with further doses planned. The clinical course showed improvement with the resolution of neurological symptoms, improvement in renal function and resolution of EBV and MPO titre levels(see attached graph). He was discharged to a community rehabilitation facility with appropriate follow-up planned

Conclusion.

This case demonstrates the complexity of diagnosing vasculitis with multisystemic presentation. A CNS vasculitis was suggested in this case by the presence of microhemorrhages, white matter changes and multi-territorial infarcts.(2)The additional finding of EBV viraemia as a source of inflammation and renal dysfunction and subsequent treatment and improvement may suggest a link between the three pathologies.

This case illustrates and serves as a reminder of the varied presentation of vasculitis and should be considered in multisystemic involvement and possibility of EBV as a a coinfection or trigger should be in consideration by the managing team

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Poster number: 172

Submission number: 596

Anti-glomerular basement membrane disease following a diagnosis of ovarian mesonephric-like adenocarcinoma.

Dr Sophie Seager, Dr Thomas Fairhead, Dr Jennifer Whitehead, Dr Sean Fenwick

Sunderland Royal Hospital, Sunderland

Dr Sophie Seager

Biography
I am currently a Foundation Year 1 doctor in the Northeast, and I graduated from Newcastle University in 2023, where I completed my MBBS. In my medical training so far, I have been interested in a variety of medical specialties. However, nephrology has stood out as fascinating and complex, with often very acutely unwell inpatients as well as patients under long term follow up in settings requiring broad multidisciplinary involvement such as the dialysis nurses, dieticians, vascular surgeons, and transplant coordinators. I am excited to learn more about the evolving specialty and I hope to be able to explore this further in the future.

Abstract

Anti-glomerular basement membrane disease (anti-GBM disease) is a rare and potentially fatal autoimmune small vessel vasculitis which affects the glomerular and pulmonary capillaries, characterised by the presence of anti-GBM antibodies. A causative stimulus has not yet been identified for the development of these antibodies, however multiple environmental factors have been described. Current evidence suggests a genetic involvement, and a strong association with certain HLA types. There are case reports of anti-GBM disease potentially triggered by malignancy, however the nature and significance of any association is presently unknown.

We report a 63-year-old female who was reviewed in gynaecology clinic with symptoms of urinary frequency, brown vaginal discharge, and an abdominal mass subsequently diagnosed with FIGO stage 3A1 left-sided ovarian mesonephric-like adenocarcinoma necessitating total abdominal hysterectomy with omentectomy, bilateral salpingo-oophorectomy, and adjuvant chemotherapy with paclitaxel and carboplatin. One year following this original presentation (four months following completion of adjuvant chemotherapy), the patient attended primary care with haematuria and malaise and was found to be anaemic. She was referred urgently to urology. Three weeks following primary care review the patient presented to hospital with anorexia, nausea, and fatigue and was found to be in stage 3 acute kidney injury (creatinine 1899 micromol/L; baseline ~70 micromol/L) with hyperkalaemia (K+ 7.3 mmol/L) and acidosis. Dialysis was commenced due to refractory hyperkalaemia and acidosis, and bloods revealed positive anti-GBM and MPO. Supplemental oxygen requirements responded well to ultrafiltration however the patient's haemoglobin fell acutely. There was hence a degree of clinical uncertainty as to whether any pulmonary haemorrhage may have also taken place and clinical suspicion leant towards anti-GBM disease in preference to an ANCA/GBM overlap glomerulonephritis. The patient was commenced on steroids, cyclophosphamide, rituximab, and plasma exchange. The patient was

eventually discharged and remains under the care of nephrology as an outpatient, with ongoing dialysis and weaning of steroids. To the knowledge of the authors this is the first reported case of anti-GBM disease in a patient with ovarian mesonephric-like adenocarcinoma.

As this report and a small number of others have previously suggested, the notion that malignancy may be able to trigger the production of anti-GBM antibodies cannot be discounted. Ovarian mesonephric-like adenocarcinoma is rare and has indeed only been recently recognised. Speculated mechanisms in other malignancies such as bronchial carcinoma include tumour invasion leading to destruction of basement membrane structures and an increase in collagenase IV expression. Other mechanisms include the suggestion that immune-modulating drugs used to treat malignancy may contribute to a proinflammatory state and depletion of regulatory T cells (Treg cells). Existing literature identifies the lymphocyte-depleting agent alemtuzumab, as a trigger for anti-GBM disease, due to the reduction of Treg cells or subsequent development of autoreactive B cells. Paclitaxel has been shown to selectively reduce the number of circulating Treg cells and directly inhibit Treg cell activity. Thus, the role of such an agent may have been somewhat contributory to the anti-GBM disease development in the reported patient.

Anti-GBM disease can be life-threatening, and its recognition is critical. It is not unfeasible that further research into elucidating any relationships between anti-GBM disease and cancer may not only alert clinicians to the possibility of the increased risk of anti-GBM disease in those with a history of certain malignancies, but also advance the understanding of the anti-GBM disease pathogenesis itself.

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Poster number: 173

Submission number: 504

A Rare Case of Secondary Membranous Nephropathy

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[1]Department of Medicine, Malta. [2]Department of Pathology, Malta. [3]Imperial College London, London

Dr Julian Delicata

Biography
Dr Delicata graduated as a medical doctor from the University of Malta in 2014 and finished his Nephrology Specialist training in January 2023. He has worked in Royal Free Hospital, London, for a year as part of his training and is currently a Resident Specialist in Mater Dei Hospital, Malta. He has a special interest in Metabolic Kidney Stone Disease.

Abstract

Introduction

Angiolymphoid Hyperplasia with Eosinophilia (ALHE) is a rare benign vascular neoplasm that has been reported to be very rarely associated with nephrotic syndrome and membranous nephropathy. Patients with ALHE tend to present with soft tissue lumps, most frequently in the head and neck region.

Case report (Methods/Results)

We present a case of a 36 year old Caucasian lady who presented to our general hospital with bilateral flank pain. A CT intravenous urogram (CT IVU) showed features consistent with a left pyelonephritis and associated left renal vein thrombosis, inferior vena cava thrombosis and partial thrombotic changes in the right renal vein.

A suspicion of possible nephrotic syndrome was raised in view bilateral lower limb oedema, a serum albumin of 25g/L (32-52g/L), a 24-hour urine collection yielding 4.8g protein per day and a thrombotic storm.

She was initially treated with empirical antibiotics and therapeutic anticoagulation, angiotensin-converting enzyme inhibitor and sodium-glucose co-transporter-2 inibitor.

Following hospitalisation for an elective kidney biopsy, she developed pleuritic chest pain and cross-sectional imaging confirmed the presence of bilateral pulmonary emboli.

Subsequent histology from the kidney biospy showed features in keeping with secondary membranous nephropathy. Serum antibodies to the phospholipase A2 receptor (anti-PLA2R), serum *Thrombospondin* Type-1 Domain-Containing 7A Antibodies (anti-THSD7) and anti-PLA2R staining on histology were all negative. Imaging modalities to determine the possible causes of secondary membranous were

performed. These included cross-sectional imaging, ultrasounds of the neck and breasts and a positron emission tomography (PET) scan, which were all negative.

Delving further into historic laboratory findings, a peristently raised eosinophil count of more than 1×10^9/L was observed. Serum IgE levels were grossly elevated at >2000 KUI/L (range <100 KUI/L). Despite her young age, she was diagnosed with peripheral vascular disease four years prior after complaining of bilateral lower limb intermittent claudication. She was found to have occlusions at the right posterior tibial and left anterior tibial arteries.

A few months prior to her presentation, a lump over the thenar eminence of her left hand was excised and histology was in keeping with angiolymphoid hyperplasia with eosinophilia (ALHE).

Our working diagnosis was that of ALHE-associated membranous nephropathy.

The patient received 3 successive doses of intravenous methylprednisolone 500mg, followed by 40mg of Prednisolone (0.5mg/kg daily). This was tapered down over 16 weeks. We observed an adequate response to steroid therapy with normalisation of albumin levels 43g/L and proteinuria of 800mg/24 hours. Serum IgE levels also declined to 1799 KUI/L.

Interestingly, her intermittent claudication has also resolved completely and on an ultrasound doppler examination, both right posterior tibial and left anterior tibial arteries were found to have recanalised.

Conclusion/Discussion

To our knowledge, this is the first such reported case involving membranous nephropathy associated with a lump in the hand showing features of ALHE in a Caucasian female.

Our understanding is that the vessel occlusions are also related to ALHE. Both the vascular occlusions and membranous nephropathy with its consequent nephrotic syndrome responded to steroid therapy.

Poster number: 174

Submission number: 533

A rare case of nephronophthisis Type 13 leading to kidney failure

Dr Catriona Macaulay[1], Dr Holly Mabillard[1], Professor John Sayer[1,2]

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Dr Catriona Macaulay

Biography
Dr Catriona Macaulay is an ST5 renal registrar training in the North East of England, currently working at The Newcastle upon Tyne Hospitals NHS Foundation Trust.

Abstract

Nephronophthisis (NPHP) is a rare autosomal recessive renal ciliopathy which typically presents in childhood and early adulthood. The kidney phenotype includes loss of urinary concentration ability, cortico-medullary cysts, fibrosis and progressive kidney impairment. Kidney failure typically occurs before the age of 30 years. Numerous different underlying genetic mutations have been identified allowing for further sub-classification of the disease, however in many cases the genetic defect remains unknown.

Here we present a 26 year-old woman with kidney failure requiring haemodialysis. She had presented aged 17 with significant kidney impairment (serum creatinine 270 µmol/L) without obvious cause which quickly progressed to kidney failure by the age of 19 years. She did not have a kidney biopsy. Past medical history includes progressive visual impairment detected in early childhood for which she was diagnosed with rod cone dystrophy and nystagmus. She also had a previous ASD repair during childhood. There was no known no family history of kidney disease and parents were not knowingly consanguineous.

Molecular genetic investigations revealed a homozygous likely pathogenic variant in WDR19 (OMIM #608151; NM_025132.3: c.1483G>C; p.(Gly495Arg)), consistent with an overarching diagnosis of Senior-Loken syndrome (a condition associated with nephronophthisis and retinal dystrophy).

To date, at least 37 cases of nephronophthisis related to WDR19 variants have been identified worldwide. WDR19 encodes IFT144, a protein involved in retrograde intraflagellar transport which is important for ciliogenesis. A patent foramen ovale has previously been reported in a single patient. Biallelic variants in WDR19 have been detected in patients with various underlying ciliopathy syndromes including Sensenbrenner, Jeune, Senior-Loken, isolated nephronophthisis, Caroli disease, retinitis pigmentosa and asthenoteratospermia (impaired sperm motility).

Given nephronophthisis can present as unexplained kidney failure with no family history of kidney disease, as in this case, it is imperative to recognise its features and extra-renal manifestations and

ensure appropriate genetic testing. Whilst nephronophthisis is a rare condition, it is a leading genetic cause of kidney failure in children, necessitating ongoing research and increased awareness.

This case is paradigmatic for our need to improve our genetic literacy as Nephrologists and to strive for precision diagnostic approaches for those with kidney disease of 'unknown cause'. Without a genetic diagnosis in this case, there would be no genetic counselling, familial screening or family planning advice. There would also be increased uncertainty regarding kidney transplant outcome without primary disease characterisation and lack of understanding or prognostication of extra-renal features. A genetic diagnosis will also contribute increased understanding and advancement of medical research and drug development for these conditions for which we are in desperate need, not forgetting the profound psychosocial benefit diagnosis provides to the patient and their family.

Poster number: 175

Submission number: 170

A case of paralysis, hypokalaemia and spontaneously resolving normal anion gap acidosis.

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Dr. Avanti Damle

Biography
Dr. Avanti Damle is an International Training Fellow in Nephrology at Salford Royal Hospital under the Northern Care Alliance NHS Foundation Trust. At the same time, she is pursuing a Master of Medicine (MMed) at the Edge Hill University. After finishing her MBBS in 2019, Dr. Damle went on to complete her M.D. General medicine in India. She is interested to train further in nephrology and wants to become a Renal consultant physician.

Abstract

Introduction: Severe muscle weakness is a known and serious complication of hypokalaemia. However, the underlying aetiology of hypokalaemia is often inadequately assessed. We present a case of hypokalaemic muscle weakness and associated normal anion gap metabolic acidosis (NAGMA) which resolved spontaneously.

A 39-year-old male presented with a history of ascending weakness progressing to quadriparesis. He had a background of antibody- negative Myasthenia Gravis, for which he was recently started on pyridostigmine. On admission, brain imaging was normal, but urgent blood tests revealed a serum potassium (K) of 1.8mmol/L. Differentials of hypokalaemic paralysis and myasthenia crisis were considered; however absence of bulbar symptoms and respiratory involvement excluded the latter. Blood gas showed a concomitant NAGMA (anion gap 11, delta anion gap -1) with a pH of 7.19. Urinary pH was relatively elevated at 6 and the urinary anion gap was calculated to be 13, hence a diagnosis of renal tubular acidosis was made. Hypophosphatemia and an acute kidney injury (serum creatinine 172 μmol/L) were also noted; however no glycosuria was found.

He was started on treatment with intravenous potassium chloride and over the next 48 hours, muscle power improved along with serum K, with complete neurological recovery over 4 days. Electromyography (EMG) and nerve conduction velocity (NCV) studies showed no evidence of neuropathy or myopathy . Strangely the acid-base status began to spontaneously normalise with the pH rising to 7.3 in the absence of any sodium bicarbonate or potassium citrate supplementation. Given the spontaneous resolution of the acid base status, the possibility of toluene exposure was considered. Urinary toluene levels were sent from a stored admission sample, which were found to be elevated at

28 mmol/L. Following oral supplementation for one week, serum K remained stable at 4.4mmol/L, and the patient was then discharged off any potassium replacement tablets.

Discussion: Toluene exposure, most commonly due to glue sniffing, has been reported to be a cause of distal renal tubular acidosis, presumably due to a defect in distal nephron H+ secretion.[1] However, metabolic acidosis may also be due to the high acid loads generated by the metabolites of toluene: benzoic and hippuric acids. The normal anion gap is explained as hippuric acid is both filtered and secreted by the kidneys and then rapidly cleared into the urine with sodium, potassium, or ammonium. The excretion of ammonium with such unmeasured anions will not reduce the urinary anion gap, as occurs when ammonium is excreted with chloride. Sodium is presented to the distal nephron with large quantities of hippuric acid, where it is reabsorbed in exchange for potassium. This leads to kaliuresis and, thereby, hypokalemia. Thus, most patients with toluene ingestion present with hypovolemia, hypokalemia that is often severe, phosphate wasting, and a normal AG acidosis.
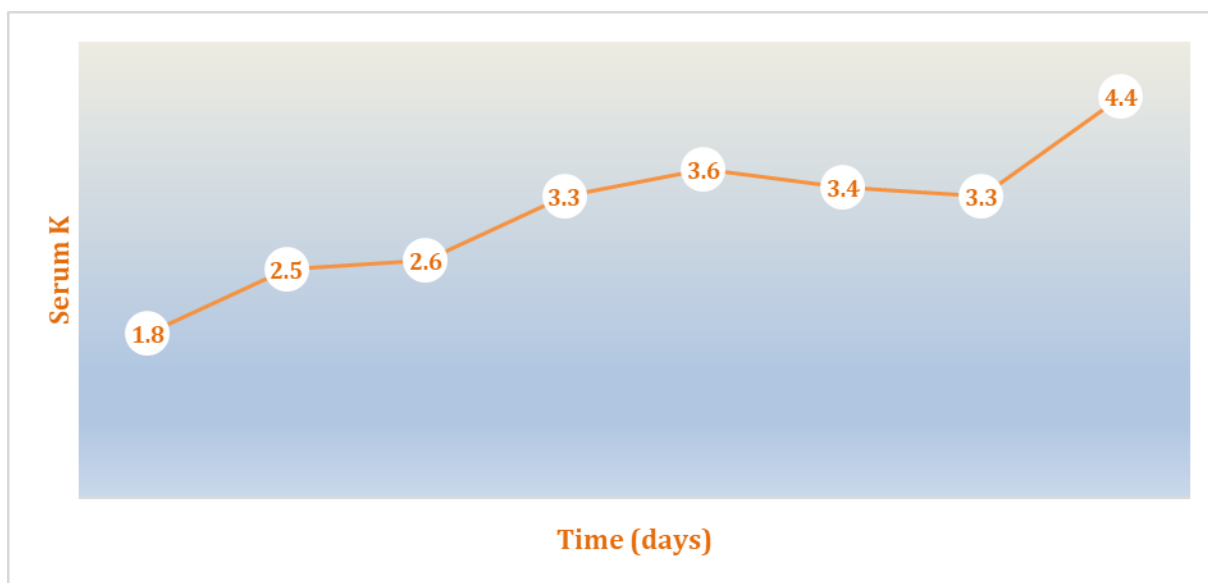
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Poster number: 176

Submission number: 605

Management of BK nephropathy - a single centre experience

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Miss Morayo Ogungbesan

Biography
MBBS2 Medical student at St George's University London

Abstract

Introduction: BK virus is a polyoma virus (BKPyV) and an important cause of allograft loss in kidney transplant recipients (KTR). Currently there are no established effective treatments with many centres using a combination of therapies and strategies to treat BKPyV. It is unclear whether the increase in immunosuppression (IS) has increased the incidence of BK viraemia or whether assays and improved screening are detecting this more frequently. We looked to determine what treatments were used for the management of BK over the last 22 years and outcomes.

Methods: An observational retrospective single centre experience looking at BKPyV. All KTR with a detectable BK plasma or urine test were identified from the renal database (cv5) from 2001 to 2023. Demographic, treatment and transplant data were extracted from the electronic patient record. Maintenance IS regimens were recorded and consisted of a combination of Tacrolimus, Mycophenolate Mofetil (MMF), Prednisolone, Sirolimus and Azathioprine. Treatments used for BKpyV eradication included; reduction of MMF (1), cessation of MMF (2) reduction in Tacrolimus (3), introduction of Ciprofloxacin (4), Leflunomide (5), Prednisolone (6) and cessation of Azathioprine (7).

Results: 37 KTR out of 525 (7%) were found to have BKPyV (34 viraemia, 3 viuria) between 2001-2023. 10 female, 27 male with a median age of 59 years (26-84 years). 9 White, 10 Asian, 7 Black, 4 Chinese, 4 Other, 3 Unknown. Primary kidney disease of KTR were: IgA 8, CKD 7, FSGS 4, Renovascular 2, T2DM 2, Congenital kidney disease 1, Glomerulonephritis 3, Malignant hypertension 1, APKD 3, SLE 2, Unknown 4. Two episodes of BK occurred following treatment for rejection, 1 drain removal and 1 ureteric stent removal. 3 KTR had biopsy proven BK nephropathy. Peak BKPyV viraemia 2.9 million copies/ml, peak viruria 1.28E+10 copies/ml. BKPyV viraemia occurred a median of 3 months post-transplant (1 month-8 years) with viuria occurring median 4 months (1 month-12 years).

The combination of treatments included; 2 KTR (1,3), 1 KTR (1,3,4), 7 KTR (1,3,6), 3 KTR (1,3,4,6), 1 KTR (1,3,5,6), 1 KTR (2,3,4), 2 KTR (2,3,6), 8 KTR with (2,3,4,6), 7 KTR (2,3,4,5,6), 1 KTR (2,3,5,6), 1 KTR

(2,3,6,7),1 KTR (3), 1 KTR (3,4,6), 1 KTR (3,6) and 1 KTR with no changes. The commonest treatment was cessation of MMF, reduction in Tacrolimus, Ciprofloxacin ranging from 2 weeks to 3 months and Prednisolone with maintenance therapy of Tacrolimus+Prednisolone. 5 KTR had 1 recurrence of BKPyV viraemia following treatment with 4 KTR having 2 episodes of recurrence all resulting in prolonged treatment with Ciprofloxacin. Remission of BKPyV was between 1 month to 12 years with a median of 2 years.

Conclusion: A combination of treatments were used in the management of BKPyV over the last 22 years in a single centre. Remission was seen in 28 KTR. The commonest intervention was to stop MMF however, despite these interventions 4 KTR lost their allografts and highlights the lack of effective treatments available to treat BKPyV viraemia and BK nephropathy.

Poster number: 177

Submission number 452

Transplant First – a regional Kidney Network approach to improving access to transplantation

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Dr Elizabeth Wallin

Biography
Liz Wallin trained in the East of England and now works as a Consultant Nephrologist in Queen Elizabeth Hospital, Birmingham. She has a special interest in transplantation, alongside a passion for service improvement.

Abstract

Introduction

Following GIRFT[1] and RSTP recommendations, our Network set out to improve access to, and equity for best-practice kidney care across the region. Transplantation is acknowledged as the optimal treatment for end-stage kidney disease, with pre-emptive listing and access to living donor (LD) transplantation as key goals for the region. Our key aims by June 2024 are:

1. All Trusts to match or exceed current best practice pre-emptive listing rates (60%)
2. Less than 20% of kidney replacement therapy (KRT) starters to be "Missed" (no documented transplant decision or still in workup)
3. A 25% increase in our "access to LD" metric

QI Methodology

The KQIP Transplant First data tool has been reported previously[2]. The new access to LD metric was defined to allow units to review upstream processes, identifying donors early in the pathway. (**fig 1**). All units have been supported to collect data on the three key aims above.

Each unit submits data quarterly, viewing reports in real time, including comparison to other units in the region. Using the KQIP '10 Steps to Improvement' model (**fig 2**) we asked each unit to complete a Driver Diagram identifying areas for improvement in their unit, alongside barriers between renal units and transplanting centres (**fig 3**). The data and driver diagrams have been presented at regional meetings to facilitate discussion between units, as well as provide support for the project from the Network and KQIP (**fig 4**).

Results

The impact of the pandemic is clear, with many units attempting to recover previous positions and aiming for further improvement. While there remains variability, overall there has been an improvement in the access to LD metric across the region. The majority of units have increased the proportion of patients listed pre-emptively, although this remains below the best practice rate of 60% in all units. All units reduced the number of KRT starters with no documented transplant decision, or who are still in work up, although work still needs to be done to bring this below 20%. **Fig 5** shows an example of this data for one hospital within the region, and **fig 6** comparisons between units.

Discussion

Across the regional Kidney Network, we have been able to gather data from renal units and transplanting centres with the aim of improving access to transplantation. While we have not yet achieved our ambitious targets, all units are showing improvement across the measured parameters and have engaged with the process of quality improvement, completing driver diagrams to identify areas for improvement. As part of the project, we have been able to fund 4.4 whole time equivalent transplant nurse specialists across 6 hospitals in the region for two years, supporting local teams to discuss transplantation and living donation. We plan to use data generated by this project to support business cases for funding these posts long term. We will continue biannual meetings supporting dialogue between renal and transplanting units, aiming to increase overall living donor transplant rates to over 20pmp for all units in the region.

Fig 1 – Transplant First tool: Access to Living Donor Metric

Living donor status	Explanatory notes
At least 1 potential living donor has reached stage 1 tests	Select this option even if the donor was subsequently unable to proceed.
No potential living donors have reached stage 1 tests	This audit measure is designed to show early identification of donors. If donors have been identified but not yet proceeded to stage1 they are not recorded here.

Denominator	Total number of patients starting KRT who were active on the list, suspended on the list, who had received a pre-emptive transplant, or "working up or under discussion"
Numerator	How many of these patients had at least 1 potential donor who had reached phase 1 tests
Caveat	Does not include patients deemed unsuitable or where there is no documented decision

Fig 2 - KQIP 10 Steps to Improvement

Steps in QI – the process

1. Agree an area for improvement
2. Assemble your team
3. Understand your problem/ system
4. Define project aim and scope
5. Choose 'just enough' project measures
6. Develop change ideas
7. Test change ideas
8. Measure impact of changes
9. Do further PDSA cycles
10. Implement successful changes

Share your progress

UKKA

KQIP
Kidney Quality Improvement Partnership

Model for improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?

ACT PLAN STUDY DO

Fig 3 – Driver Diagram example

To increase potential recipients with a donor to >30% and rate of LD to >20pmp

Delays in process
- Administration → Admin support / Generic e mail
- Ordering tests → Order earlier in pathway / Nurse ordering

Identification of LD
- Systematic opportunities → Restart annual WL review (with LD in proforma)
- AKCC education/information → Develop education and information booklet / LD team to have education sessions with AKCC team

Communication breakdown
- Donors/recipients → Communication consent letter
- Recipient/donor teams → Regular MDT / Structured EPR note

| AIM STATEMENT | PRIMARY DRIVERS | SECONDARY DRIVERS | CHANGE IDEAS |

Fig 4 – Framework for Network and KQIP support

Engagement
- Regional lead
- Nominated unit QI leads (triad including MDT, trainee and medic)
- Patient involvement
- Endorsement from Transplant working group and TIGs
- Gathering data

Engagement face-to-face meet
- Same day as TIGs
- Present current data
- Explore areas of best practice / areas in need of improvement
- Shape priorities and aims
- Include RSTP

QI training workshops
Helps unit teams set up and plan project
- Appreciative enquiry
- Communication and engagement
- Aim statements
- Measurement for improvement
- Driver diagrams
- PDSA cycles
- Sustainability

Support
- In between training workshops
- QI drop-in surgeries
- Peer assist

Review
- Regional workshops sharing PDSA cycles and improvements / challenges / successes

Communicate and report
- UK Kidney Week abstracts
- Network news
- RSTP toolkit

Fig 5 – KRT starters data example

Fig 6 – Percentage of eligible patients at the start of KRT who have at least 1 living donor who has reached stage 1 tests (rolling 12 months) – averaged across the region.
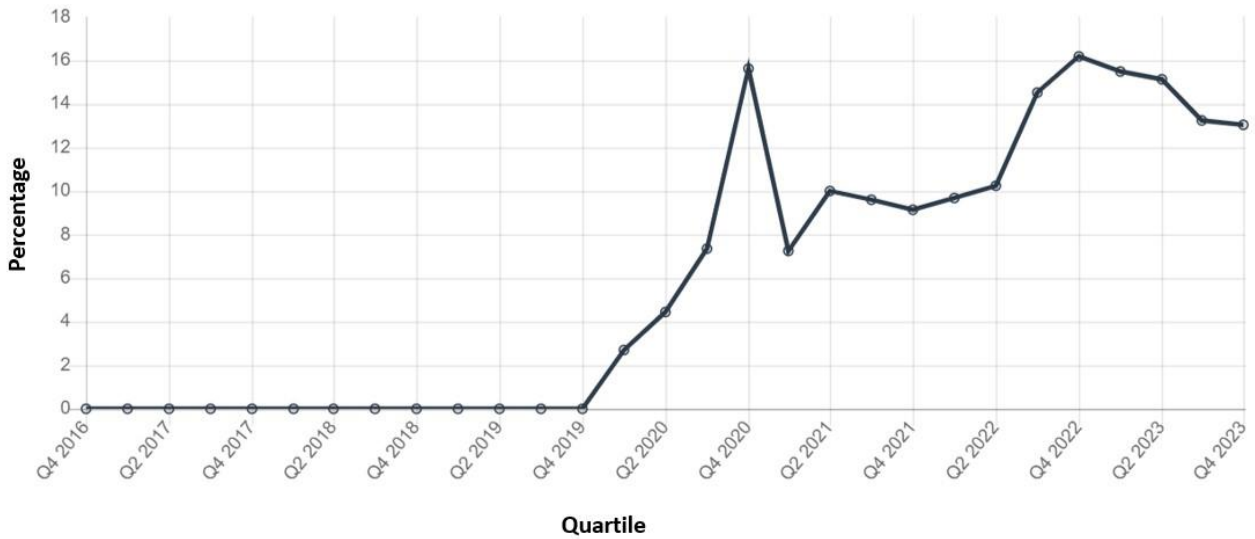
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The impact of appointing a Transplant Coordinator at a non-transplanting centre.

Miss Ellen Pattullo, Dr Zoe Pittman

University Hospitals of Derby and Burton NHS Foundation Trust, Derby

Miss Ellen Pattullo

Biography
The lead author qualified in 2012 and started their career on a Midland based renal ward. In 2021, they had a yearlong secondment with the post renal transplant team prior to successfully applying for this transplant coordinator post funded by the NSHE Midlands. They have now been in their new role for 14 months and are looking forward to contributing to improved access to kidney transplantation.

Abstract

Introduction

In 2018 a Getting it Right First Time (GIRFT) report identified transplant workup and listing as a major area of weakness at this non transplanting centre. The effect of the gap in our service was apparent in the network data that showed a very low rate of renal transplants as compared to other units across the region. It was recognised that the major barrier to overcoming this was a lack of workforce (as evidenced in the transplant survey data)

Methods

In December 2021 this unit was successful with a bid to NHSE Midlands for recurrent funding for 1WTE Band 6 transplant coordinator role to improve access to kidney transplantation.

A focus of this role was to undertake a QI project to improve access to transplantation, increase transplant listing and reduce the unwarranted variation in access to pre-emptive or early transplant listing and Living Donors transplantation across renal and transplanting units. By collecting real time data identifying patterns and reasons why patients aren't listed for transplantation pre-emptively. This role was appointed to in November 2022.

Our initial focus was to review and streamline the pathway for patients in the work up and referral process. We achieved this by working with our cardiology department to prioritise our patients by their estimated start date of dialysis. We also worked with our respiratory team to deliver T-spot testing for our patients in our unit, which historically was done at our transplanting centre. In addition, we implemented a unit MDT to review all patients in the work up and referral process allowing us to identify delays. Data was collected on the transplant dashboard allowing us to track change over time including data on the median and mean waiting times to listing.

From January 2024 our focus will be broadened to include the facilitation of live donation discussions by carrying out initial conversations and the first stage of screening of potential donors.

Results

Following the appointment of the transplant coordinator, quarterly transplant listing increased by more than 200%, as demonstrated in the table below. This has resulted in the number of patients on the national transplant list for our centre increasing by 20% in the last 18 months. In 2022, 32 patients were transplanted, this increased to 37 patients for the year 2023.

Year & Quarter	Total No of patients listed	No of patients listed pre-emptively
2021 Q1	1	1
2021 Q2	7	4
2021 Q3	8	5
2021 Q4	2	0
2022 Q1	6	4
2022 Q2	7	3
2022 Q3	2	2
2022 Q4	**19**	**9**
2023 Q1	**15**	**7**
2023 Q2	**17**	**5**
2023 Q3	**13**	**6**
2023 Q4	**14**	**6**

Table 1 Number of patients listed per quarter 2021 -2023. Appointment of role was at the beginning of Q4 in 2022 - reflected in bold.

Discussion

In a very short time, this role has had a significant impact in increasing access to transplantation for patients at this centre. We believe this is a model which could improve equity of access to transplantation in other non-transplanting centres. Although we have not yet seen a large increase in transplanted patients the average wait time on the list means that there will be a delay and we expect the numbers to increase over the next year.

Poster number: 179

Submission number: 469

Shifting the cultural mindset of African Caribbean communities towards Living Donor Kidney Transplantation- feasibility of a tailored phone buddy focused conversation approach

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[3]Gift of Living Donation, London

Dr Dela Idowu

Biography

Dela Idowu is the Executive Director and Founder of Gift of Living Donation (GOLD) an organisation that raise awareness of living donation in the Black African Caribbean community. She set-up the charity after coming forward as a living donor for her brother who had kidney failure and needed kidney transplant. Her book, 'More Than a Match', narrates a compelling and emotional personal account of her family's struggle to come to terms with kidney failure, dialysis, and transplantation. Her film 'We Are Family" aimed to, educate and empower Black people with end-stage renal disease needing a kidney transplant to have a candid conversation about living kidney donation with their loved ones. She is a member of the Kidney Advisory Group, NBTA and British Transplant Society. GOLD has worked on collaboratively with NHSBT, Kidney Research UK, Kidney Care UK, and currently in collaboration with 3 London Healthcare Trusts and London Kidney Network to implement a tailored community quality improvement model to improve equity of access to and increase pre-emptive living donation transplantation among Black African Caribbean patients. In November 2023 she was awarded an Honorary Fellowship Award from the

Abstract

Introduction

Increased patient survival, graft survival and enhanced health related quality of life following Living-Donor Kidney Transplantation (LDKT) has been widely reported in addition to being the optimal treatment for most people with chronic kidney disease (CKD). However, of all kidney transplants performed in the UK each year, only 28% are LDKT below that of the USA and the Netherlands. Most importantly, individuals from Black, Asian and minority ethnic populations in the UK are underrepresented compared to White people to receive a LDKT. Reported reasons include religious and cultural beliefs, as well as limited knowledge about donation.

This quality improvement explored the use of a tailored phone buddy led focused conversation method to increase the accessibility, acceptability and equity of LDKT within African Caribbean communities in London. This initiative is part of a multi-centred LDKT quality improvement project.

Methods

Stage 1: Community-based participatory research framework was used to identify engagement approaches and design of semi-structured conversational questionnaire.

Stage 2: Advertisement via local renal units, dialysis centres, social media, email and mobile phone.

Stage 3: The focused conversation method involves answering, through conversation, a series of questions organised into four phases (objective, reflective, interpretative, and decisional) that draw upon the different approaches in which people process and make decisions about information, while promoting order and systematic dialogue. Additionally, sticky pads were provided for attendees to record understanding, perceptions and concerns regarding LDKT. The venue was a local church with round table seating, each with a Black living donor and recipient to engage with attendees. The 3-hour event included lived stories of LDKT donors and recipients, breakout sessions, LDKT cultural congruent information, feedback from breakout session and a call to action. The event included entertainment by the Black Living Choir whose members are all living donors.

Minimal demographic and medical data were collected.

Stage 4: This stage included quantitative analysis of demographics and the co-designed semi-structured conversation, as well as thematic analysis of the focussed conversation.

Results

The event was attended by 20 patients with CKD stage 4-5, 8 family and friends and 16 phone buddies. All attendees were of African and Caribbean heritage, 50% male (n=10), 85% (n=17) with chronic kidney disease stage 4. The semi-structured conversational questionnaire was completed by 5 family and friends and 7 patients. Friends and family themes were lack of information, fear and risk of surgery. Patients' themes included fear, guilt, lack of culturally congruent LDKT information, "unsure how to start the conversation" "don't want to worry them", "might cause tension in the family" and family not in UK. Patients, family members and friends reported that more of such culturally congruent are needed as it had improved their knowledge and understanding of and had equipped and motivated them to initiate LDKT conversations. 3 patients have initiated LDKT conversations with family and friends.

Discussion

The success of this tailored LDKT event confirms the urgent need of community led interventions to increase LDKT conversations in unserved communities. The presence and support of trusted phone buddy with lived LDKT experiences could improve patients knowledge and understanding and equip and motivate them to initiate LDKT conversation with family and friends. Co-creation and co-design approaches between community charities, stakeholders and NHSBT is pivotal if the renal community are to address the LDKT associated inequities in the UK and beyond**.**

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Poster number: 180

Submission number: 481

Mycophenolate contraception advice; a review of practice across renal transplant units throughout the United Kingdom (UK).

Mr. Dane Howard[1], Ms. Janette Chu[2], Mr. Chris Herring[3]

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Mr. Dane Howard

Biography
Dane is currently a Solid Organ Transplant Pharmacist at St. James Hospital, Leeds specialising in Renal and Liver transplant and Organ Retrieval. He is currently undertaking a masters in Social Science Research for Healthcare focusing on Pharmacogenomics and current areas of interest include improving medicines optimisation in the post transplant setting, Pharmacist led post-transplant clinics, transplant immunosuppression and new drug therapies in antibody incompatible transplantation.

Abstract

Introduction

Mycophenolate is linked to a high incidence of serious birth defects and an elevated risk of spontaneous abortion. In 2015, the MHRA issued a drug safety update, offering guidance on pregnancy testing before initiation and contraception during and after discontinuing mycophenolate[1]. Subsequently, the advice for male patients was updated in 2018 to provide further clarification[2]. The Renal Pharmacy Group (RPG) Research and Development sub-group aims to review current practices and provide recommendations to standardise practice for both male and female patients across renal transplant units in the UK.

Methods

A multiple-choice electronic questionnaire was designed to gather data on compliance with the MHRA recommendations, the delivery and documentation of patient education, and the advice provided to male patients wishing to father a child. The hyperlink to the questionnaire was emailed to the renal pharmacy teams of the 23 adult transplant units in the UK. The work was not classified as research and did not require ethical approval according to the Health Research Authority decision tool[3].

Results

Responses were received from 21 of the 23 units (91%). Among these, 19 (90%) routinely initiate mycophenolate at the time of transplant, while the remaining units start it for patients meeting specific criteria (e.g. basiliximab induction or high immunological risk). Table 1 outlines differences in pregnancy testing, patient education (verbal/written), and documentation when mycophenolate is initiated either during the transplant admission or post-discharge.

For male patients wishing to father a child whilst taking mycophenolate, among the units that answered the question (n=18), 10 (55%) would allow the father to decide about staying on it after receiving the appropriate risk/benefit advice. The remaining units either would not consider a switch due to a lack of evidence (22%) or would routinely switch patients to an alternative medicine (22%); once initiated on mycophenolate, only 2 (9%) units revisit this information annually with patients (NB the MHRA currently do not provide any recommendation on how often the education should be revisited).

Discussion

While most renal transplant units initiate mycophenolate at the point of transplant and have robust procedures in place for pregnancy counselling, patients commencing treatment after this initial admission may lack the same level of input, including the recommended pregnancy test for female patients. There is a lack of standardisation across units regarding male patients fathering a child whilst taking mycophenolate. Further national guidance may help ensure that patients are provided with consistent advice regardless of the unit they receive their care from.

Recommendations from this review:

1. Ensure the same process is followed when initiating mycophenolate, regardless of where in the patient journey it is commenced.
2. Revisit pregnancy counselling annually with patients.
3. Record pregnancy-specific counselling in patient records with next review date.

Table 1		Initiation during transplant admission	Initiation post-transplant admission*
Pregnancy test required before initiation		21 (100%)	5 (31%)
Patient education on risks and contraception	Face to Face	19 (90%)	14 (87%)
	Written Information	17 (80%)	6 (37%)
Documentation of general mycophenolate counselling in patient record		10 (47%)	4 (25%)
Documentation of pregnancy specific counselling in patient record		4 (19%)	0 (0%)
* Note that 16 units answered questions about initiating mycophenolate in the post-transplant setting.			

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Poster number: 181

Submission number: 517

Quality Improvement project to increase the proportion of patients listed for kidney transplantation in a non-transplanting kidney centre.

Summra Siddiq[1], Hugh Leonard[2], Sapna Shah[2], Katie Vinen[2]

[1]Guys and St. Thomas Hospital NHS trust, London. [2]Kings college Hospital NHS trust, London

Summra Siddiq

Biography
Summra Siddiq is nephrology trainee in the South London region, currently posted in Guys and St. Thomas Hospital NHS trust as ST4 registrar in the Nephrology department for transplant rotation. She has done her graduation and IMT training overseas, and have completed MRCP medicine from RCP London .Her recent publications include Incidence, patterns and characteristics of patients with acute kidney injury requiring renal replacement therapy in cancer settings published in November 2023 and Prevalence of erythrocytosis and associated clinical manifestation in renal transplant recipients published in July 2023. Her research interest includes immune -mediated renal diseases, transplant rejections , acute kidney injury and genetic disorders in renal medicine.

Abstract

Introduction

Renal transplantation is the treatment of choice for many patients with end-stage renal failure. Transplant candidates undergo extensive workup before activation on the transplant list. However, due to acute illnesses or other health problems they get suspended or unfit and remain off the list until they achieve the desired optimization. These categories are trust-based depending on clinical reasons with the aim to reactivate as soon as possible. (i),Suspended category, includes patients with acute illness or other temporarily reasons;(ii), Unfit-reconsider group consists of patients requiring more medical attention or investigation before being reconsidered for reactivation, and (iii), Unfit-permanent, containing patients with irreversible contraindications to transplantation.

To minimise delays to listing for transplantation, we conducted this QIP to identify the underlying causes and propose solutions.

Methodology

This retrospective, single center, cross-sectional analysis was performed on all patients undergoing peritoneal dialysis (PD), haemodialysis (HD) or under the low clearance team (AKCC) in a tertiary London centre (Kings College Hospital). Only patients who were not active on the transplant list were included. Patients were categorised into three groups: suspended, unfit-reconsider and unfit-permanent (Table 1).

Clinical notes were reviewed and data on baseline demographics) collected alongside cause for suspension (Table 2). Patients with failing transplants were not included in this QIP.

RRT modality	Number of patients			
	Active (not analysed)	Suspended	Unfit-reconsider	Unfit-permanent
HD	70	108	79	303
PD	23	7	16	31
AKCC	17	5	49	300

Table 1: Patients included in analysis according to RRT modality and delisting category.

Table 2: Baseline demographics of study population.

	Suspended	Unfit-reconsider	Unfit-permanent
RRT modality (HD/PD/AKCC)	120 (108/7/5)	144 (79/16/49)	634 (303/31/300)
Age (mean±SD)	54.57±10.26	57.08±10.26	76.84±9.36
%Male	56.7	59.7	56.2
Frailty score (mean± SD)	2.97±1.04	3.44±1.19	4.60±1.36
% with BMI >30	32.5	25.7	19.9
% with BMI>40 (%)	0	21.5	2.5

Results

A total of 898 patients were included (table 2) .Time since suspension was <1 year in 55.1%, 1-3 years in 33.1% and >3 years in 11.8%. Time since being considered unfit-reconsider was < 1 year in 60.4%, 1-3 years in 32.6% and >3 years in 6.9% (graph 1). 33% of patients were suspended due to patient choice or uncertainty. Other causes for suspension included awaiting medical optimization (14%), review by other teams (12%) and repeat scans or cancer screening (15%) – (graph 2).

Causes for being considered unfit, for reconsideration are listed in table 2. Again, medical optimization and review by other teams were the cause for delisting in significant numbers (23 and 24% respectively). Among the patients considered unfit-reconsider, there were high rates of obesity (BMI >40 in 19%, 30.6% and 6.1% among HD, AKCC, and PD patients respectively).

Graph 1:Time since categorising for patients in suspended or unfit-reconsider categories
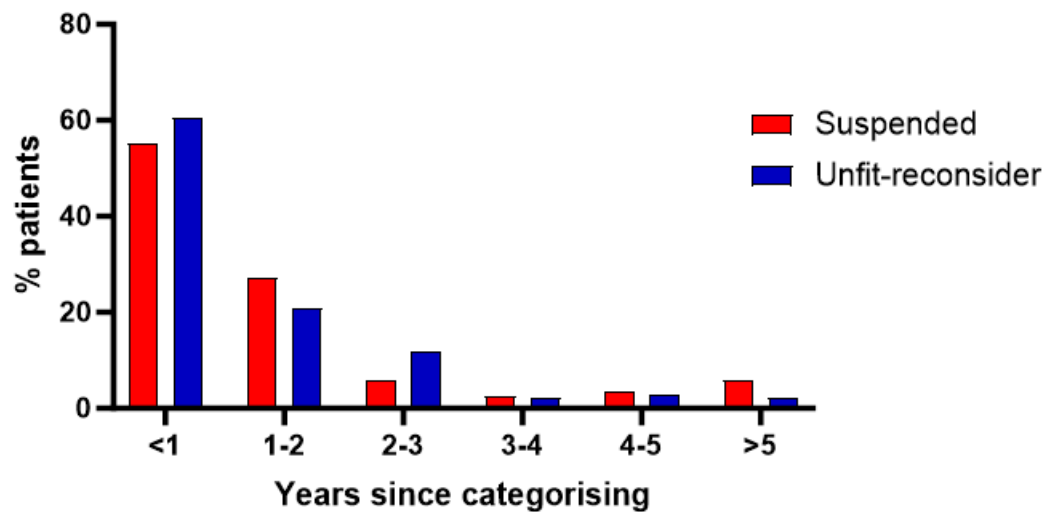
Graph 2: Reasons for removal from transplant list for suspended and unfit-reconsider patients
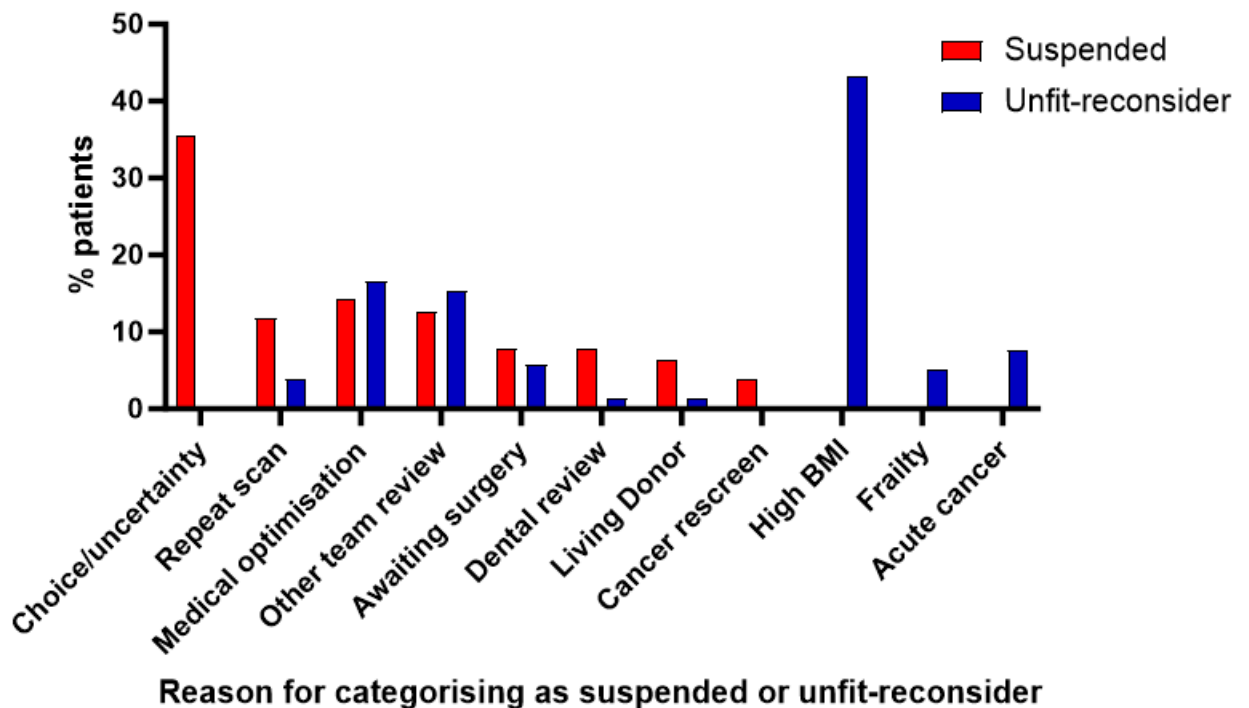
Discussion

These findings highlight the causes for delays in listing patients for transplantation and support a case for streamlining the care of this population through specialist clinics, reducing delays in which further RRT-related morbidity and mortality may occur as any delay will add to the median 509 days expected on the waiting list.

A common factor between both those suspended and those deemed unfit for reconsideration was delay in getting specialty review in particular, cardiac, urology and vascular opinions, and medical optimization , in particular for heart failure. Obesity remains a challenge even with a specialist renal weight reduction clinical service, given the post-transplant risks with steroid use..

Other interventions identified by this QIP include a need to standardise the application of these delisting categories across the department and increasing collaboration with other departments to expedite review of transplant candidates. This has already been achieved with dentistry to good effect.

Poster number: 182

Submission number: 520

The Kidney Quality Improvement Partnership (KQIP) Transplant First project – a summary of successes so far and ongoing challenges

Dr George Corfield[1], Dr Sourabh Chand[1], Dr James Tollitt[2], Maria Fernandez[3], Dr Rachel Davison[4], Dela Idowu[5], Leeanne Lockley[6], Dr Kerry Tomlinson[6], <u>Dr Rosemary Donne</u>[6]

[1]Shrewsbury and Telford, West Midlands. [2]Northern Care Alliance, Greater Manchester. [3]St Georges, London. [4]South Tyneside, North East. [5]GOLD, London. [6]KQIP, UKKA

Dr Rosemary Donne

Biography
Rosie is a Consultant in Kidney Medicine and lead for the advanced kidney care clinic at Salford Royal, Northern Care Alliance. With a strong interest in Quality Improvement, she was the Salford Transplant First project lead from 2018 - 2021, and is KQIP national clinical co-lead as well as KQIP North West medical lead. She is also leading the new KQIP advanced kidney care project due to start in 2024.

Abstract

Introduction

Pre-emptive kidney transplant is the gold standard treatment for CKD stage 5 but was only achieved in 8% of patients starting kidney replacement therapy (KRT) in England pre-COVID[1]. The pandemic negatively impacted transplantation, with only 5.8% of incident KRT by pre-emptive transplant in 2021[2]. Significant variation between UK renal centres exists (0-30%), suggesting that high pre-emptive transplant rates are possible with optimised culture, education and pathways. Living donation is the key to optimising outcomes in pre-emptive transplantation but rates vary between 5-40 per million population[3]. Transplant First was offered as a QI project in 2016 by the Kidney Quality Improvement Partnership (KQIP) and expanded across most of England over subsequent years. The RSTP toolkit advises units and networks to collaborate to increase access to transplantation. The outputs of the Transplant First programme so far are presented here.

Methods

KQIP delivered a regional 12-month QI training and support programme via workshops and webinars, including use of the Transplant First online measurement tool. Training was paused from 2020 - 2021. QI teams convened for the National Transplant First webinar in November 2023 to share learning, which was grouped into themes. Outcome data was presented where available. Guest speakers provided insights on excellence in living donation and engagement with the black community (GOLD initiative[4]).

Results

The common themes of successful QI initiatives presented at the National Transplant First webinar are summarised in Table 1. Participating centres reported shortening of work-up times and increases in number of referrals to transplant surgeons, pre-emptive listing and the number of transplants performed (see Figures 1 and 2).

Table 1

Optimising culture for pre-emptive transplant in advanced kidney care clinics	Culture of pre-emptive living donor transplant as gold standard, supported by standardised patient education
	Earlier discussions about need for transplant and living donation, eg. "Talk Transplant at eGFR 25"
	Track rapidly progressing CKD patients, eg. use of KFRE
	Collect local data and undertake root cause analysis for patients not listed pre-emptively
Maximising pathway efficiency	Increase numbers of specialist nurses for living donor and recipient pathways
	Make the live donor pathway patient friendly, eg. weekend appointments
	Set up one-stop donor / recipient work-up clinics including dedicated cardiology support
Collaborative working between transplanting and referring centres	Standardised workup protocols
	Electronic referral forms and communication
	Facilitate communication with transplanting centres, eg. MDTs, dedicated admin support
Maximising patient engagement	Access to peer support for donors and recipients
	Ethnic minority engagement programmes, eg. Gift Of Living Donation (GOLD) initiative
	"Prehabilitation" programmes - e.g. Kidney Beam

Figure 1 – Renal Centre A

Pre-emptive time to referral

Quarterly no. of patients pre-emptively transplant-listed

(interventions marked: Transplant first; Overwhelmed Team; Department talk; Transplant nurse recruitment; KQIP)

No. of referrals to transplant surgeons

No. of prevalent transplant patients

Figure 2 – Renal Centre B

Number of patients entering transplant list

Project start — 94 (2018), 158 (2019), 72 (2020), 116 (2021), 143 (2022), 159 (2023)

No. of transplants performed per year

Project start — 65 (2017), 71 (2018), 76 (2019), 47 (2020), 67 (2021), 83 (2022), 91 (2023)

Discussion

The KQIP Transplant First project has successfully trained and facilitated renal unit QI teams to test, measure and implement interventions to improve access to transplantation. This has enabled a rapid, sustainable recovery from the impact of the pandemic in many units. KQIP facilitated the sharing of knowledge and formation of a network of interested clinicians to enable future improvements.

Interventions were broadly grouped into four themes:

1.) Optimising culture for pre-emptive transplant

2.) Maximising the efficiency of donor and recipient pathways

3.) Collaborative working between referring and transplanting centres

4.) Maximising patient engagement and peer support.

Significant challenges remain in efforts to increase rates of pre-emptive transplantation including late referral for workup, lack of an evidence-based recipient workup protocol, waiting time for cardiac tests, obesity management, engagement with ethnic minority groups and shortage of specialist nurses. There is still a large gap to close to address the inequalities in access to living donation. Funding and expertise are needed for long term community and online peer support schemes to replicate the success of the GOLD peer buddy scheme. The Transplant First programme has identified the barriers to pre-emptive transplant and potential solutions which could be widely adopted by renal units, regions and commissioners. Future KQIP Transplant First webinars and support will facilitate the ongoing sharing of knowledge and enable further improvements.

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Poster number: 183

Submission number: 554

The Impact of Living Donor Kidney Transplantation Publicity Campaigns

Dr Jen Lumsdaine[1], Mrs Julie Glen[2], Mrs Linda White[3], Dr Colin Geddes[2]

[1]Living Donation Scotland, Edinburgh. [2]NHS GG&C, Glasgow. [3]Scottish Government, Scotland

Dr Jen Lumsdaine

Biography
Jen Lumsdaine completed her Registered General Nurse training in Edinburgh in 1989 and worked in various specialties, including intensive care before becoming a donor transplant coordinator in 1997. Alongside the multi-organ donor and renal recipient work she specialised in the living donor kidney programme and completed her PhD in 2006. She is currently working with the Scottish Government to raise awareness and improve equity of access to living donor transplantation in Scotland.

Abstract

Introduction

Living donor kidney transplantation (LDKT) programmes depend on potential donors coming forward offering to be assessed and importantly, recipient acceptance of another individual undergoing surgery to donate. A number of initiatives are in progress to increase knowledge in both these areas, including home education programmes and national awareness campaigns. LDKT public awareness campaigns aim to increase knowledge and awareness in the general population – often with a focus on non-directed donors, but also to inform about the benefits of LDKT for recipients, their families and social networks.

As part of a measure of the impact of publicity campaigns data and to demonstrate living donor team workload we collect healthcheck questionnaire return data from all units in Scotland. All living kidney donors require to submit a healthcheck questionnaire (HCQ) to commence the assessment process. The healthcheck questionnaire is available on the national website or by request from individual teams.

Methods

We collected monthly HCQ return data from April 2021 – October 2023 from our 7 renal units and 2 transplant units to measure the response to national publicity campaigns, evidence workload and compare the number of potential directed donors and the intended recipients. Information is also gathered for the number of non-directed donors. Web statistics were obtained for information pack and healthcheck questionnaire downloads. We acknowledged that due to the time of donor assessments the comparison of HCQ and actual transplant numbers is only a reflection of usual activity.

Results

A total of 1603 people returned healthcheck questionnaires for 1132 individual recipients. The total number of living donor transplants performed was 237 in the same time period (393 deceased donor transplants). There were increases during and following national publicity campaigns in January-March each year for web visits, pack downloads and HCQ returns. The number of non directed (altruistic) HCQ ranged from 0-8 per month, with an average of 3-5 per month.
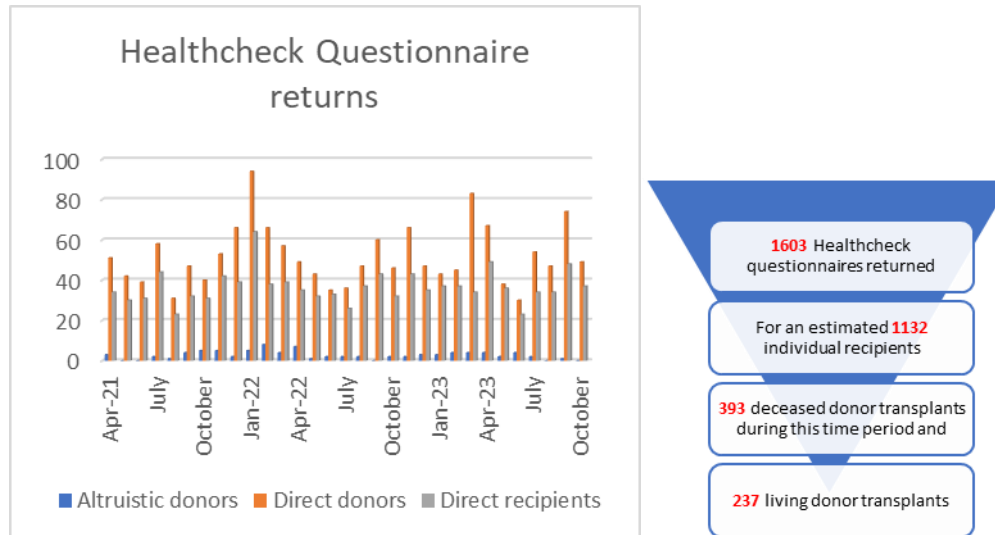
Discussion

Transforming potential donors to actual donors is multi-factorial, but the first step is to facilitate donors and recipients into a programme. Our data highlights the importance of local and national media campaigns to continually keep living donation in the public eye. We also reflect the significant workload for the living donor teams with the large number of recipients who have a potential donor who do not reach living donor transplantation. Further work is ongoing to identify reversible reasons for non-progression for both donors and recipients. Living donor transplantation is the most economically and environmentally effective treatment for those who would benefit from a transplant, and this data supports both the continued importance of publicity and workload support required for living kidney donation.

Improving access to transplantation at a satellite dialysis unit.

Dr Nidhi Agrawal, Dr Rachel Middleton, Dr Francesco Rainone, Dr Yasser Al-mula Abed, Zoe Morris

NCA NHS Foundation trust, Salford

Dr Francesco Rainone

Biography
Dr Francesco Rainone was born and raised in Italy. He graduated magna cum laude at "Vita-Salute" S. Raffaele University, Milan, in 2007. He obtained his CCT in Renal Medicine in 2014, training between Italy and the UK. He has been working as Consultant Nephrologist at Salford Royal NHS Trust since 2014. His interests are in dysproteinemias and transplantation. He has joint responsibility for an HD satellite unit. He is the current president-elect of the Nephrology Section of the Royal Society of Medicine.

Abstract

Introduction:

Transplant listing is at risk of being deprioritised amongst the numerous medical issues of patients on dialysis. On an average, maintenance dialysis patients have a consultant review every 2 months to review all medical issues including transplantation status. The main aim of this project was to improve the time to and therefore access to transplant listing. There are often delays in communication between consultant, link nurses, transplant co-ordinator, and transplant surgeons based at the regional transplant centre. A key focus of this project was to bridge the communication gap between the team members involved in transplant work up.

Methods:

We are a non-acute transplant centre. The project was carried out at a satellite dialysis unit dialysing around 100 patients in a week over 3 shifts per day. It started in August 2022 and was based on model of improvement. The number of patients listed in the deceased donor transplant list and under work up were recorded at baseline. Interventions included bimonthly MDT meetings, creation of an accessible dataset and dedicated time for a clinical fellow to lead on this project. A live dataset on sharepoint containing comprehensive transplant listing related information including status in the work up process, outstanding investigations and outstanding issues was developed. We established multi-disciplinary team (MDT) meetings involving clinical fellow (lead author), consultants, transplant co-ordinator, link nurse and live donor specialist nurse. Points discussed in the MDT included review of suitability for transplant, new medical issues, pending investigations, expediting appointments and reactivation of patients moved to suspended list due to acute illness. We reviewed the number of patients in the deceased donor list and number of patients transplanted over a year after introduction of our intervention.

Results:

In August 2022 (baseline), there were 94 patients dialysing at the unit. 61.7% were not listed for transplant due to various clinical and patient-related reasons, 17% were active and 8.5% were suspended in the deceased donor waiting list. 12.8% of patients were undergoing work up.

In July 2023, the total number of patients dialysing in the unit were 103. 46.6% were not listed for transplant, 20.4% were active, 20.4% were suspended and 12.6% were undergoing work up.

With our intervention, the total number of listed patients increased from 25.5% to 40.8% over 1 year. A total of 8 patients were transplanted in this period with 50% of the transplants in last 3 months alone.

August 2022 · July 2023

17%, n= 16
8.50%, n= 8
12.8%, n=12
61.7%, n=58

20.4%, n=21
20.4%, n=21
12.6%, n=13
46.6%, n=48

■ Active ■ Suspended ■ Work up ■ Not for transplant
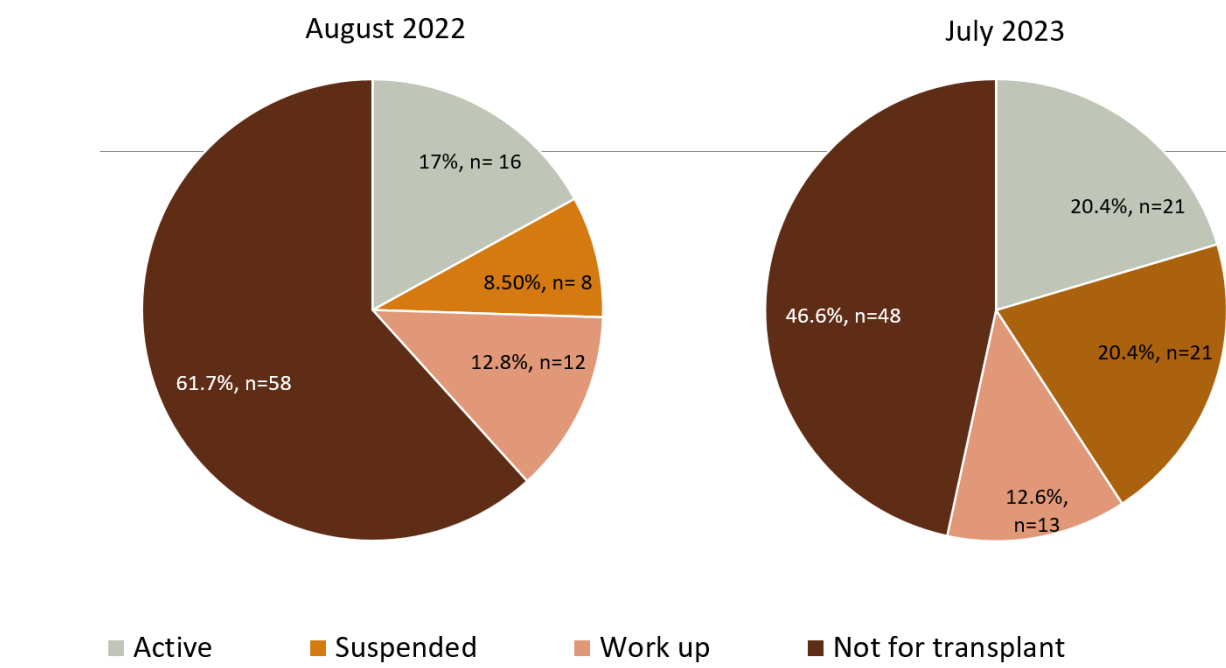
In January 2024, the number of patients in the transplant process remains similar to that in July 2023 with 20% in active list, 18.5% in suspended list and 12% under work up. To note, a further 7 patients have been transplanted in the last 5 months alone (between August 2023 to 8th January 2024) compared to 4-8 patients per 12 months in pre COVID era. This indicates the success of our intervention.

Discussion:

The team found the MDT very helpful. A bimonthly 30-40 minute meeting helped to address the issues related to transplant listing quite effectively. We would suggest that implementation of a similar MDT across other dialysis units could improve the transplant listing process.

Poster number: 185

Submission number: 413

A Single Centre Experience of COVID-19 Vaccination Responses and Mortality in Renal Transplant Recipients

<u>Dr Fatima Abbas</u>, Dr Coralie Bingham, Dr Rihan Clissold

Exeter Kidney Unit, Royal Devon University Healthcare NHS Trust

Dr Fatima Abbas

Biography
Fatima Abbas, MBBS, MRCP(UK), Renal PGDip USW. A renal and GIM higher speciality trainee at ST4 level, Southwest deanery, currently working in Exeter renal unit. Graduated from Ahfad University of Women in Sudan and completed foundation and training in general medicine there before registering in the GMC and joining the NHS. Worked in several renal units as an SHO then a registrar namely the South West Thames Renal and Transplantation unit at St Helier hospital before joining King's College Renal unit. This has allowed for a wide exposure to different aspects of nephrology and developing an enthusiasm and interest in RRT especially transplantation. Presented a poster for UKKW 2021 on maintaining patency in AVF/AVG and recently won the royal college of physician Southwest poster competition. Newly developed an interest in medical education, being involved regularly with medical students during my most recent placement, and hoping to persue this further.

Abstract

Introduction

Renal transplant recipients are at higher risk of adverse outcomes and higher mortality rates with Coronavirus disease- 2019(COVID-19)infection[1].Vaccine efficacy and immunologic responses amongst this cohort remains less than that for the general population[2,3].Evidence has shown that immunosuppressive medications were the most marked risk factor for seroconversion failure after vaccination and were more pronounced in those on triple immunosuppression[4].We aimed to study the immunologic response of transplant recipients in our centre to COVID-19 vaccination and potential factors that may have resulted in failure of response with emphasis on the immunosuppression regimen.

Methods

A retrospective cohort study of kidney transplant recipients from a single centre in the UK.Severe acute respiratory syndrome coronavirus 2(SARS CoV-2) spike antibody results of all renal transplant recipients from December 2020 to June 2023 were collected from our electronic patient record; current active recipients (i.e.alive and remain under our care) were a total of 536 while COVID-19 deaths were extracted separately and amounted to 9 deaths.Further data was extracted for those recipients who

were either spike antibody negative or had died as a result of COVID-19 to study factors that may have contributed to seroconversion failure and/or adverse outcomes from COVID-19 infection.

Results

Of the 536 active kidney transplant recipients,25(4.7%) tested negative for SARS CoV-2 spike antibody. The total COVID-19 deaths were 9 recipients of which 6(67%) were spike antibody negative and no antibody data was available for the remaining 3.

In the 25 recipients who were negative for SARS CoV-2 spike antibody, mean age was 54, 16(64%) were male. Mean co-morbidities were 1.7 with 28% having diabetes mellitus. 16(64%) were on triple maintenance immunosuppression,5(20%) on dual whilst 4(16%) were on monotherapy.Tacrolimus and prednisolone were the most common immunosuppressants in 22(88%) of the recipients,19 (76%) were on mycophenolate mofetil (MMF) and 2(8%) sirolimus or azathioprine (Figure 1).Seventeen (68%) were known to have received COVID-19 vaccination; the mean number of doses was 4. Ten(40%) acquired COVID-19 of which 40% required hospitalisation,2(20%) were unvaccinated(Table 1).

For the 9 patients who died, the mean age was 61, 78% male. Mean co-morbidities were 2.4, 67% with diabetes mellitus. 67% were on triple immunosuppression including tacrolimus, MMF and prednisolone while the remaining were on dual therapy. 89% were vaccinated, mean number of doses 2.6. As these patients were critically unwell, immunosuppressives were modified:MMF was stopped in 67% (all patients who were on MMF) and tacrolimus held in 63% (of those on it). Intensive therapy unit (ITU) admission was required in 56%(Table 1).

Table 1: Demographics and clinical characteristics of recipients: active recipients who tested negative for SARS CoV-2 Spike antibody (N=25) and recipients who passed away as a result of COVID19 infection (N=9). (Abbreviations: N: number, no.: number, ITU: intensive therapy unit, DH: history).

Characteristics	Spike Ab Negative Recipients(Alive, N=25)	COVID19 Deaths Amongst Recipients(N=9)
Mean Age (years)	54	61
Sex- no. (%)		
Male	16(64)	7(78)
Female	9(36)	2(22)
Co-morbidities		
Mean	1.7	2.4
Diabetes Mellitus - no. (%)	7(28)	6(67)
Second Renal Transplant - no. (%)	2(8)	3(33)
Other Organ Transplants - no. (%)		
Pancreas	4(16)	0(0)
Liver	1(4)	0(0)
History of Transplant Rejection- no. (%)	11(44)	3(33)
History of Viraemia- no. (%)	7(28)	3(33)
Immunosuppressants - no. (%)		
Triple agents	16(64)	6(67)
Dual agents	5(20)	3(33)
Monotherapy	4(16)	0(0)
COVID19 Vaccination- no. (%)		
Vaccinated	17(68)	8(89)
Declined/ Unavailable data	8(32)	1(11)
SARS COV-2 Spike Antibodies - no. (%)		
Negative	25(100)	6(67)
Unavailable	0(0)	3(33)
Aquired COVID19 Infection - no. (%)	10(40)	9(100)
Clinical Characteristics of those who aquired COVID19 infection - no. (%)	N=10	N=9
Required hospital admission	4(40)	9(100)
ITU	0(0)	5 (56)
Triple Maintinance Immunusuppression(including MMF; DH)	5(50)	6(67)
Unvaccinated	2(20)	1(11)

Figure 1: Immunosuppression Regimen in 25 active recipients with SARS CoV-2 Spike Ab negative. (Abbreviations: Ab: antibody, MMF: Mycophenolate mofetil, AZA: Azathioprine).
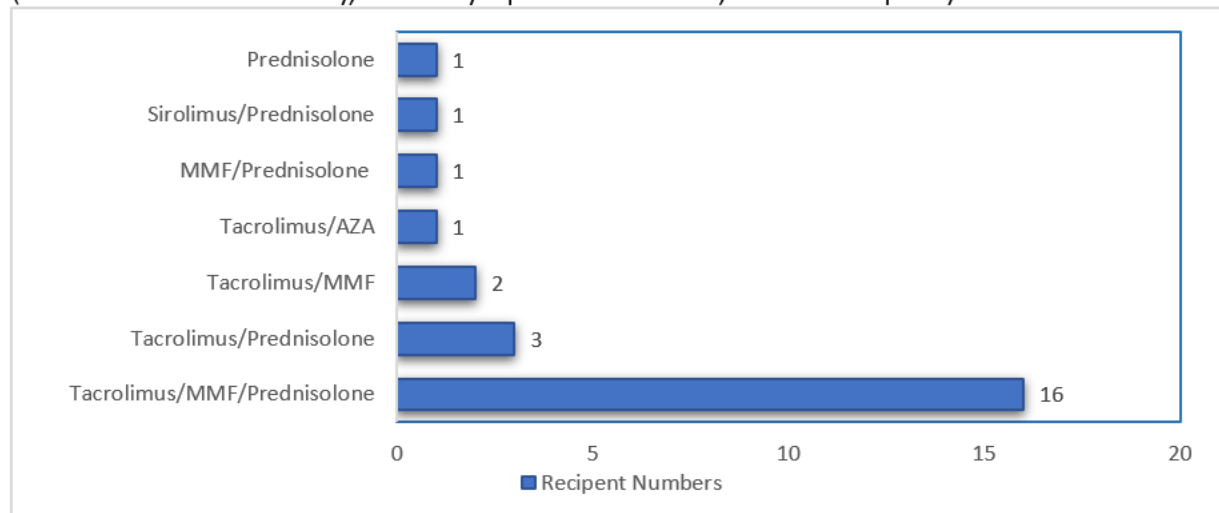
Discussion

The majority of those transplant recipients who failed to mount an immunologic response against COVID-19 vaccination and/or passed away had received multiple vaccine doses and were on triple immunosuppressants. Identifying this cohort of individuals is important so that additional protective strategies can be considered such as modification of immunosuppression regimen where possible and offering recruitment to relevant trials such as PROTECT-V (PROphylaxis for PATIENts at Risk of COVID-19 infecTion -V)[5].

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Poster number: 186

Submission number: 615

Eyes on the Prize - Acetazolamide induces severe Acute Kidney Injury

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Dr Joana Medeiros

Biography
Nephrology resident

Abstract

INTRODUCTION: Acetazolamide (ACTZ), a carbonic anhydrase inhibitor, has been associated with acute kidney injury (AKI). There are case reports of anuric AKI requiring dialysis and hemorrhagic anuria with AKI following the administration of acetazolamide. The mechanism of AKI is attributed to intra-tubular obstruction by acetazolamide-induced crystalluria.

CASE PRESENTATION: A 50 years old man with obesity and sleep apnea syndrome was submitted to a cornea transplant due to keratoconus. ACTZ 250mg once a day was started with the medical advice to continue at home after discharge. One week later, he went to the emergency department due to intense low back pain, initially on the right and later bilateral and a decreased urinary output. Analytically, a normal anion gap metabolic acidemia (pH 7.34, HCO3- 14, anion gap 14) and an acute kidney injury with a serum creatinine (sCr) of 8.1mg/dL (patient's baseline value 0.89mg/dL) were present. A computed tomography scan was performed, which excluded a vascular catastrophe and an obstructive etiology - the kidneys had preserved shape and dimensions. ACTZ was discontinued, and supportive treatment with fluid resuscitation and analgesia was started. A favorable diuretic response was observed, avoiding the need for dialysis. A urinalysis was only collected later, after bicarbonate replacement was started, and only showed a microscopic hematuria with 25-50 red blood cells/μL without any other relevant findings. In the following days there was a sustained improvement in the sCr and normalization of the serum bicarbonate level. The patient was discharged from hospital after 5 days, at this point with a sCr of 1mg/dL.

DISCUSSION: This case highlights the rare but significant risk of AKI associated with acetazolamide therapy, emphasizing the importance of clinicians being aware of this potential side effect. Close monitoring of renal function and fluid status is essential and alternative treatment options should be considered when appropriate.

Poster number: 187

Submission number: 429

IgA-Dominant Post-Infectious Glomerulonephritis Secondary to Staphylococcus aureus Infection: A Case Report

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Dr Michael Habeeb

Biography
Renal Registrar at RSCH

Abstract

Introduction

Post-infectious glomerulonephritis (PIGN) is an immune complex glomerulonephritis that commonly affects children and young adults following beta haemolytic Streptococcal throat or skin infections. Kidney biopsy is characterised by Segmental or global endocapillary hypercellularity, and crescents may be present. In immunofluorescence, post-infectious glomerulonephritis typically shows IgG and C3 deposition.

A rare type of PIGN is IgA-dominant post-infection glomerulonephritis. It commonly occurs in the setting of active infection. It usually presents in patients > 60 years old with diabetes mellitus, alcohol consumption, and Staphylococcal infections. It can present with RPGN, AKI, and nephrotic syndrome. Hypocomplementemia can be present, and immunofluorescence is characterised by IgA dominance with C3 co-dominance and no IgG. Despite the strong association with Staph aureus, however, it has been reported with other types of infections.

The main line of treatment is antibiotic eradication of the infection. Steroids can be used based on the severity of the lesion and the presence of crescents. Its prognosis is worse than that of the traditional PIGN.

In this case, we report a case of IgA-dominant post-infectious glomerulonephritis secondary to left ankle osteomyelitis with Staph aureus infection.

Case Presentation

A 65-year-old lady had open reduction and internal fixation of a left trimalleolar ankle fracture in June 2023 at a district general hospital. Unfortunately, the post-operative course was complicated by wound infection. The wound swab showed Heavy growth of Staphylococcus aureus. This was followed by Acute Kidney Injury (AKI) stage 3; therefore, she was transferred from her hospital to our renal ward. On

admission to the ward, her creatinine was 388mmol/L(baseline creatinine was 73 mmol/L one month before admission), urine dipstick was positive for blood and protein, and urine protein creatinine ratio was 480 mg/mmol. She had only a medical background of bronchial asthma for which she was only on Inhalers (Beta Agonist) as a regular medication.

CT scan of the left ankle revealed appearances consistent with osteomyelitis of both the lateral and medial malleoli. This finding was discussed with microbiology and Orthopaedic teams, and the patient was started on intravenous antibiotics (Vancomycin followed by doxycycline).

A kidney biopsy was done. Mesangial electron-dense deposits were identified. Immunohistochemistry revealed IgA dominant, predominantly mesangial positivity, with associated C3. The picture was consistent with IgA acute glomerulonephritis associated with S. aureus, which is a post-infectious Glomerulonephritis with dominant IgA staining (rather than conventional IgA nephropathy).

With proper intravenous hydration and antibiotics, her inflammatory markers started to improve, and her renal chemistry followed the inflammatory markers, and her last creatinine improved to 146mmol/L, eGFR 31 ml/min, and UPCR was 40 mg/mmol.

Discussion

IgA-dominant post-infectious glomerulonephritis is now a distinct form of PIGN, which usually presents with acute kidney injury, haematuria, and proteinuria and is typically related to Staph aureus infection. In contrast to typical IgA nephropathy, there is no role for steroid or immunosuppression in the treatment of IgA-dominant post-infectious glomerulonephritis, and the treatment is mainly dependent on the treatment of infection.

Poster number: 188

Submission number: 461

Assessment of the relationship between endothelial glycocalyx shedding, systemic microvascular perfusion and acute kidney injury during coronary artery bypass graft surgery.

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Dr Jennifer Joslin

Biography

Jen Joslin is a South Thames Renal trainee. She is currently undertaking a PhD at King's College London within a British Heart Foundation Clinical Research Training Fellowship, exploring endothelial glycocalyx dysfunction and impaired microvascular perfusion during cardiac surgery and the relationship with acute kidney injury. She has previously held a Biomedical Research Centre Clinical Research Fellowship and an NIHR Academic Clinical Fellowship. Jen has a longstanding interest in AKI with involvement in multiple audits and quality improvement projects. She is a local PI for the Applying Systems Thinking to enhance recovery after acute kidney injury (AsterAKI) study.

Abstract

Background

Cardiac surgery-associated acute kidney injury (CSA-AKI) is common and increases mortality and morbidity. Pathogenesis is multifactorial, including many factors associated with microvascular disruption. A healthy endothelial glycocalyx (eGCX) layer is necessary to maintain microvascular perfusion. Studies have found an association between increased eGCX shedding and microvascular perfusion alterations in patients undergoing surgery with cardiopulmonary bypass but associations with CSA-AKI are unknown. We have previously demonstrated that patients undergoing coronary artery bypass graft (CABG) surgery who develop CSA-AKI have increased intraoperative shedding of eGCX constituent syndecan-1 (SDC1). Here we aimed to determine the relationship between eGCX shedding, microvascular perfusion assessed by incident dark field (IDF) videomicroscopy and CSA-AKI.

Methods

We conducted a prospective observational cohort study of patients undergoing non-emergency CABG surgery. Systemic microvascular perfusion was assessed using sublingual IDF videomicroscopy in accordance with international consensus recommendations, using a CytoCam video microscope. Imaging was performed at baseline, intraoperatively after anastomoses completed, and in the immediate post-operative period. Videos were pseudonymised and analysed using current consensus criteria. All

participants were ranked in terms of peak intraoperative plasma SDC1 concentration and IDF analysis was undertaken on ten of the top third ('high shedders') and ten of the bottom third ('low shedders'), selected in extreme rank order from those with at least three adequate videos from all three time points. Microcirculatory variables at each time point were compared with SDC1 shedding and CSA-AKI outcomes within 48 hours (Kidney Disease Improving Global Outcomes criteria).

Results

61 participants were included, of whom 14 (23.0%) developed CSA-AKI. 30 participants (49.2%) had complete good quality IDF data; collection was limited by technical, time and space constraints in theatre. IDF videos from 20 were analysed: ten high shedders and ten low shedders. Three participants with complete IDF analysis (15%) developed CSA-AKI, all from the high shedders group.

PVD and SDC1 concentration throughout were negatively correlated (r_s=-0.293, p=0.023); intraoperative correlation was strongest (r_s=-0.484, p=0.031).

PVD was significantly lower during surgery than at baseline and then returned towards baseline values in the immediate post-operative period in both high and low shedders groups (Table 1). The proportion of perfused vessels and vessel-by-vessel microvascular flow index did not differ across assessed time points.

There were no significant differences in PVD between high and low shedder groups at any time point. However, intraoperative decrease in PVD tended to be greater in high shedders than in low shedders (3.29 [1.34,5.78] vs 1.96 [0.46,3.42] mm/mm^2) although not statistically significant.

Those who developed CSA-AKI had a greater intraoperative drop in PVD than those who did not (Figure 1). Small sample size precluded significance testing.

Discussion

Sublingual microvascular perfused vessel density (PVD) was negatively correlated with plasma SDC1 concentration, particularly intraoperatively, and decreased from baseline during CABG surgery before returning towards baseline postoperatively. Observations suggest possible greater reduction in microvascular perfusion in patients with greater eGCX shedding and that this may be associated with CSA-AKI. These results are consistent with the hypothesis that impaired systemic microvascular perfusion may contribute to CSA-AKI but larger samples are needed.

Table 1. Perfused vessel density by timepoint and by endothelial glycocalyx shedding group.

Perfused vessel density (mm/mm², median [IQR])	Baseline	Intraoperative	Significance of difference from Baseline	Postoperative	Significance of difference from Baseline
All (n=20)	18.38 [16.89,20.12]	15.44 [14.89,17.28]	p=0.0015	17.72 [16.24,18.38]	ns
High shedders (n=10)	19.15 [16.71,21.79]	15.50 [12.75,17.19]	p=0.0114	17.46 [15.86,18.13]	ns
Low shedders (n=10)	18.02 [16.51,19.52]	15.44 [15.17,17.61]	p=0.0316	17.78 [16.57,19.39]	ns

Figure 1. Change in perfused vessel density from baseline to intraoperative in participants who did (n=3) and did not (n=17) go on to develop CSA-AKI.
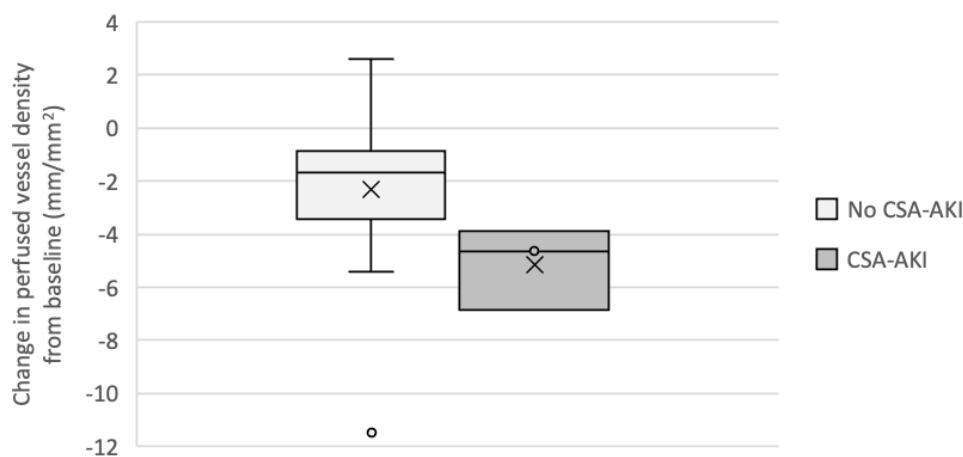
Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

ClinicalTrials.gov NCT05471583

Poster number: 189

Submission number: 490

Characterising the natural history of renal recovery after AKI in a prospective cohort - does timing matter?

Dr Rebecca Noble, Professor Nicholas Selby

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Dr Rebecca Noble

Biography
Dr Noble is a Renal Trainee who is currently working at the Centre for Kidney Research and Innovation (CKRi) in Derby as a research fellow following a successful year at the Precision Imaging Beacon as a clinical research fellow based at the University of Nottingham. Dr Noble's interests are acute kidney injury (AKI) and non-invasive techniques which can be used to evaluate kidney disease. She has a particular interest in mutliparametric MRI and has maintained links with the renal imaging group at The Sir Peter Mansfield Imaging Centre (SPMIC). As well as work in AKI, Dr Noble has also collaborated with SPMIC with work developing sodium MRI and evaluating the impact of dialysis on whole organ sodium levels. She is also the lead for the CKRi patient and public involvement group, ensuring research questions are patient focussed. Currently Dr Noble is working towards a PhD with the University of Nottingham.

Abstract

Table 1: Renal recovery by creatinine value

	Day 30 (n=87)	Day 60 (n=79)	Day 90 (n=76)
Creatinine increase from baseline < 10%	33 (38%)	32 (41%)	31 (41%)
Creatinine increase from baseline < 20%	44 (51%)	42 (57%)	38 (50%)
Creatinine increase from baseline < 50%	62 (71%)	63 (80%)	59 (78%)

Table 2: MAKE outcomes

	Day 30 (%) n=92	Day 60 (%) n=88	Day 90 (%) n=88
Composite incidence	40 (43%)	38 (43%)	37 (42%)
RIP	6 (7%)	10 (11%)	12 (14%)
RRT	3 (3%)	3 (3%)	4 (5%)
Persistent renal dysfunction*	31 (34%)	25 (28%)	21 (24%)

*Defined as a GFR >25% less than baseline

Introduction: Acute kidney injury (AKI) is associated with an increased risk of chronic kidney disease (CKD) [1]. Failure of recovery of serum creatinine by 90 days after AKI strongly associates with subsequent long-term reductions in renal function [2], however there is no consensus agreement on the definition of renal recovery. Further, detailed prospective descriptions of the 'renal recovery phase' between AKI and 90 days are lacking. Here we describe outcomes at serial timepoints (days 30, 60 and 90) for a prospective cohort of hospitalised patients with AKI.

Methods: Single centre, prospective cohort study of participants with all stages of AKI. Each participant was characterised in detail, including AKI aetiology, co-morbidities and frailty. Baseline blood and urine samples were obtained at the time of consent. Participants were then followed up at days 30, 60 and 90 with clinical measurements and blood and urine sample collection. Blood tests included serum creatinine and GFR measured by the CKD-EPI equation [3]. The proportion of participants with renal recovery at different creatinine above baseline thresholds as well as major adverse kidney events (MAKE) a composite outcome of death, new dialysis, and persistent renal dysfunction, defined as a 25% or greater decline in GFR was determined at day 30, 60 and 90. Where data was missing, last creatinine / GFR was carried forward for day 60 and 90, or discharge creatinine for day 30.

Results: A total of 124 participants were recruited. 63% of patients had AKI on hospital admission. The median baseline creatinine was 88 (IQR 70-117) mmol/L and median GFR was 68 (46 – 87) mL/min/1.73m^2. Median peak creatinine of 306 (IQR 177 – 458) mmol/L. The majority of AKI was severe (stage 1 (24%) vs stages 2 & 3 (76%)). The most common primary aetiology of AKI was dehydration (46%) followed by sepsis (22%). Table 1 demonstrates the number of participants with 'recovered' renal function as defined by a creatinine above baseline of 10%, 20% and 50% from baseline (the latter being reversal of KDIGO AKI stage 1) across the timepoints. Non-recovery of renal function was common across all time points, ranging from 22% to 59% at day 90 depending on which definition of recovery was applied. Table 2 summarises the rate of major adverse kidney events (MAKE) for day 30, 60 and 90, that was predominantly driven by persistent renal dysfunction.

Discussion: This study is one of the few prospective descriptions of the AKI recovery from time of AKI to day 90. Whilst it is known that failure to recover creatinine by day 90 is predictive of future renal dysfunction, these data suggest that there is little dynamic change after day 30 and suggests that interventions to prevent the AKI to CKD transition should be targeted in the first 30 days after AKI in order to have the biggest impact. These data also highlight the need for a consensus definition of non-recovery of renal function. Future work on this cohort will therefore include relating different thresholds of renal recovery to outcomes.

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Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

NCT05014022

Poster number: 190

Submission number: 503

Serial Multiparametric Magnetic Resonance Imaging in a Prospective Cohort of Patients with Acute Kidney Injury

Dr Rebecca Noble, Dr Eleanor Cox, Professor Maarten Taal, Professor Nicholas Selby, Professor Susan Francis

University of Nottingham, Nottingham

Dr Rebecca Noble

Biography
Dr Noble is a Renal Trainee who is currently working at the Centre for Kidney Research and Innovation (CKRi) in Derby as a research fellow following a successful year at the Precision Imaging Beacon as a clinical research fellow based at the University of Nottingham. Dr Noble's interests are acute kidney injury (AKI) and non-invasive techniques which can be used to evaluate kidney disease. She has a particular interest in mutliparametric MRI and has maintained links with the renal imaging group at The Sir Peter Mansfield Imaging Centre (SPMIC). As well as work in AKI, Dr Noble has also collaborated with SPMIC with work developing sodium MRI and evaluating the impact of dialysis on whole organ sodium levels. She is also the lead for the CKRi patient and public involvement group, ensuring research questions are patient focussed. Currently Dr Noble is working towards a PhD with the University of Nottingham.

Abstract

Table 1: Baseline characteristics

Characteristic	Mean ± standard deviation, median [IQR] or percentages, as appropriate
Sex (M:F)	5:5
Age	62 ± 9
Co-morbidities	
BMI	32.2 (29.1 – 37.3)
Rockwell frailty score	3 (2 – 3)
Charlson co-morbidity index	3.5 (2.75 – 4.25)
Diabetes	n = 6 (60%)
Ischaemic heart disease	n = 2 (20%)
Heart failure	n = 2 (20%)
Medication	
ACEi/ARB	n = 3 (30%)
NSAIDs	n = 1 (10%)
Diuretics	n = 2 (20%)
Baseline kidney function	
Baseline creatinine (μmol/L)	84 ± 21
Baseline GFR-EPI (mL/min/1.73m^2)	82 (60 – 89)

Fig. 1

Table 2: clinical parameters at time of AKI

Characteristic	Mean ± standard deviation, median [IQR] or percentages, as appropriate
AKI stage	
1	n = 1 (10%)
2	n = 4 (40%)
3	n = 5 (50%)
Peak creatinine (μmol/L)	302 (158 – 500)
Primary cause of AKI	Dehydration n = 4 (40%)
	Hypercalcaemia, n = 1 (10%)
	Sepsis n = 5 (50%)
Serum albumin (g/L)	30 ± 7
Serum CRP (mg/L)	25 (4 – 59)
Duration of AKI (days)	3 (3 – 17)
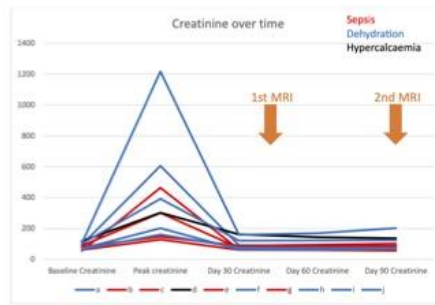
Figure 2. Total kidney volume (TKV) volume data for AKI patients at the two MRI visits with patients colour coded by primary cause of diagnosis (healthy values are shown as a green band).
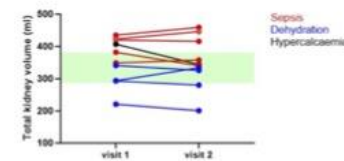
Introduction: Recovery from acute kidney injury (AKI) is traditionally measured using serum creatinine but this can often over-estimate the degree of renal recovery [1]. It is known, however, that failure of recovery of serum creatinine 90 days after AKI strongly associates with subsequent long-term reductions in renal function [2] making it an important clinical timepoint. Magnetic resonance imaging (MRI) is an imaging modality with promise to improve the understanding and characterisation of renal pathophysiology [3, 4]. In a single multiparametric MRI (mpMRI) scan, multiple measures can assess renal morphology, tissue microstructure (T_1 relaxation time and diffusion-weighted-imaging (DWI)), oxygenation, perfusion and blood flow. We previously published the first study of renal mpMRI at the time of AKI and during follow up [5], this showed increased total kidney volume (TKV) and T_1 as a measure of inflammation/fibrosis at the time of AKI which remained elevated in some participants at 3 and 12 months despite normalisation of serum creatinine. This study aimed to assess the degree of change between 30 and 90 days post AKI, as the first 90 days after AKI appear to be the important in terms of outcomes.

Methods: Prospective observational study of 10 participants with AKI of all stages recruited at the time of AKI and followed up with monthly bloods and urine. MRI scans were collected on a Philips Ingenia 3T at day 30-60 and day 90. The 1-hour protocol included: T_2-weighted scans for automated segmentation to compute total kidney volume (TKV) [6], as well as T_1 & T_2 mapping, DWI, ASL and phase contrast MRI for kidney perfusion and blood flow, and TRUST-MRI and BOLD R_2* for kidney oxygenation, and MRE for stiffness

Results: 10 participants were scanned at 2 timepoints, (mean day 45 for 1st scan, 95 for 2nd scan). Baseline characteristics are summarised in Table 1 along with key clinical measures in Table 2. 2 participants had CKD at baseline. Despite a range of peak creatinine values and AKI stages the majority of participants serum creatinine normalised to within 20% of baseline by 30 days (v3) (Figure 1). Figure 2 shows the TKV for AKI patients across the 2 visits as compared with healthy values. Despite

normalisation of biochemistry, 5 participants have enlarged TKV. The predominant AKI aetiology for these patients was sepsis. Across all participants there is little dynamic change between visits. The participant with the small TKV across both visits had pre-existing CKD, as well as the highest peak creatine. The participant did not recover renal function by day 90 (Figs 1(j) & 2).

Discussion: Despite recovery of biochemistry, at least half of this AKI cohort had abnormal MR measures at that persisted through one and three months after the AKI episode. There is a trend towards larger TKV in patients with AKI due to sepsis, which needs to be explored in a larger cohort. Analysis of more parameters as well as the addition of liquid biomarkers will enrich these preliminary findings.

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Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

NCT05014022

Poster number: 191

Submission number: 581

Outcomes Of Acute Kidney Injury Patients Requiring Renal Replacement Therapy In A Prospective Cohort

Dr Rebecca Noble, Professor Nicholas Selby

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Dr Rebecca Noble

Biography
Dr Noble is a Renal Trainee who is currently working at the Centre for Kidney Research and Innovation (CKRi) in Derby as a research fellow following a successful year at the Precision Imaging Beacon as a clinical research fellow based at the University of Nottingham. Dr Noble's interests are acute kidney injury (AKI) and non-invasive techniques which can be used to evaluate kidney disease. She has a particular interest in mutliparametric MRI and has maintained links with the renal imaging group at The Sir Peter Mansfield Imaging Centre (SPMIC). As well as work in AKI, Dr Noble has also collaborated with SPMIC with work developing sodium MRI and evaluating the impact of dialysis on whole organ sodium levels. She is also the lead for the CKRi patient and public involvement group, ensuring research questions are patient focussed. Currently Dr Noble is working towards a PhD with the University of

Abstract

Introduction: Severe acute kidney injury (AKI) sometimes requires renal replacement therapy (RRT). Patients who receive RRT have increased risks of subsequent CKD and ongoing dialysis dependence, although much of the epidemiological data are retrospective. Here we describe the outcomes of a prospective cohort of AKI patients who required RRT under the care of a renal team and compare to patients with AKI but did not require RRT.

Methods: Participants from a prospective observational cohort study were categorised into 2 groups: those who required RRT during AKI and those who did not. Baseline characteristics, details of AKI and outcomes were collated and compared between groups. The proportion of participants with renal recovery as well as major adverse kidney events (MAKE) was determined at days 30, 60 and 90 following AKI. MAKE was defined as a composite outcome of death, new dialysis, and persistent renal dysfunction, defined as a 25% or greater decline in GFR.

Results: A total of 124 participants were recruited, of whom 19% required acute RRT. In those who did not require RRT, baseline creatinine was lower and eGFR was higher. There was a significant difference between peak creatinine between the two groups. In the RRT group, median peak creatinine was 702mmol/L (IQR 447-1158) versus 245mmol/L (168-386) in the non-RRT group (p=<0.001). AKI aetiology was similar between groups with volume depletion the most common in both. MAKE in the RRT group vs non-RRT group was different at all timepoints. This was most pronounced at day 30 (composite incidence 63% RRT vs 38% non-RRT), 50% of MAKE was persistent renal dysfunction, with death and RRT

dependence making up 25% each. MAKE90 was 56% in the RRT group as compared to 39% in the non-RRT group. 75% of the patients who were dialysis dependent at this timepoint had been dialysis dependent since the time of AKI, the other had pre-existing CKD and progressed to end-stage kidney failure. The change in incidence across the timepoints was predominantly driven by recovery of renal function which went from 50% of MAKE30 to 30% of MAKE90 for those requiring RRT.

Discussion: Patients who receive RRT for AKI are well recognised to experience worse short and long-term outcomes. We confirm very high rates of MAKE following RRT-requiring AKI, but that renal recovery can occur in some of this group between day 30 and day 90 following AKI.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

NCT05014022

Poster number: 192

Submission number: 495

Evaluation and impact of a new nephrology led acute kidney Injury in a district general hospital clinic

<u>Dr Mustakim Khandaker</u>[1,2], Dr Saeed Rahman[1,2], Dr Ragit Varia[1], Mrs Loreta Palas[1], Miss Keila Calland[1], Mr Andrew Williams[1], Miss Sophie O'Brien[1]

[1]Whiston Hospital, Prescot. [2]Liverpool University Hospitals NHS Foundation Trust, Liverpool

Dr Mustakim Khandaker

Biography
Consultant in Renal and Acute Medicine Whiston Hospital Mersey and West Lancashire Teaching Hospitals NHS Trust

Abstract

Introduction:

Acute kidney injury (AKI) has a significant impact on inpatient hospital admissions costing the NHS in the UK an estimated £1bn[1]. Hospitalisation complicated by AKI results in increased length of stay and mortality and up to a fifth of discharged patients are readmitted to hospital within 30 days[2]. Traditionally district general hospitals in the UK have limited nephrology cover. In our large district general hospital, a new nephrologist led AKI clinic was established to review patients whose inpatient admissions were complicated by a stage 2 or 3 AKI. Over a 7-month period the aim was to evaluate this new clinic and its impact for local patients and the hospital trust.

Methods:

Inpatients with stage 2 and 3 AKI were identified by a specialist AKI nurse and nephrologist as suitable for the clinic. A discharge summary was generated with the stage and cause of AKI. Patients were seen within 6 weeks of discharge by either a nephrologist or a specialist AKI nurse. Data was retrospectively collected, and this included diagnosis, causes of AKI, highest stage of AKI, progression of chronic kidney disease (CKD) and referral to tertiary chronic kidney disease services. Using the hospital's own AKI dashboard, we looked at 30-day readmission rates of all AKIs and overall hospital length of stay over this period.

Results:

Retrospective data was collected for 245 patients who attended the clinic over 7 months. 43.9% had a stage 3 AKI, 41.4% had a stage 2 AKI, the remainder of patients were CKD patients with progression or had an underlying glomerular pathology. The most common cause for AKI was hypovolaemia (41.8%) followed by infection/sepsis (37.7%). Most AKIs fully resolved (58.1%), 7% of patients had not resolved and 27% partially resolved. 12.3% of patients were referred onto nephrology tertiary services.

Over the course of the 7 months, the trend of 30-day readmission rates dropped from 18.2% to 10.1% (Fig 1.). There was no significant change in hospital length of stay.

Conclusion:

The nephrology led AKI clinic has had a meaningful impact in our post discharge patient care. We have been able to review patients in a timely manner providing them with a holistic approach. A significant number of patients were identified and referred early for specialist tertiary CKD management. Over the 7-month period there was a reduction in 30-day readmission rates however it has not yet affected overall length of stay. This study supports a nephrologist led AKI clinic in a district general hospital.

Fig 1. Readmission rates of AKI
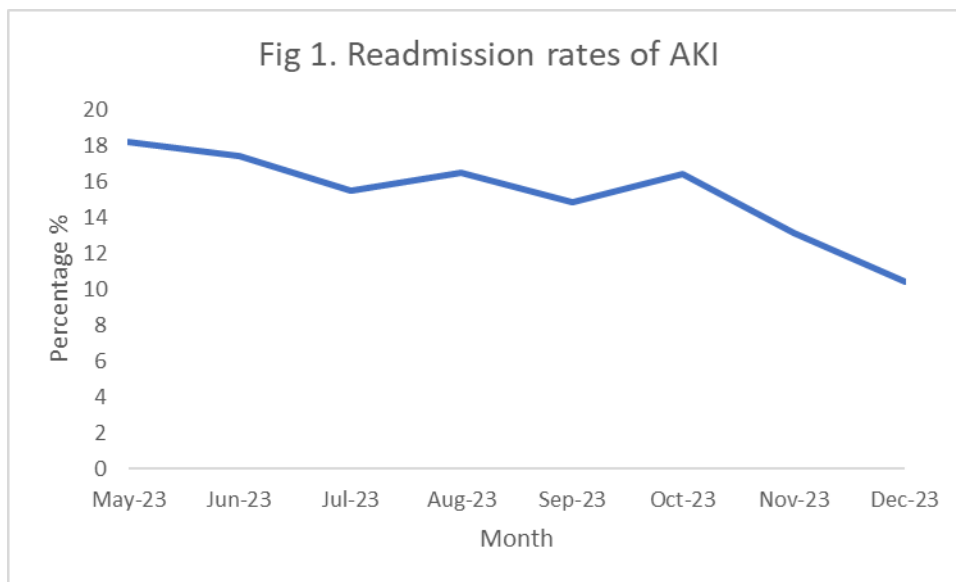
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Poster number: 193

Submission number: 505

Characteristics and outcomes of Emergency department patients with stage 2 and 3 acute kidney injury alerts.

Dr Shilpa Kaki[1], Dr Christopher Reilly[1], Dr Paula Marchetti[2]

[1]Doncaster royal Infirmary NHS Foundation trust, Doncaster. [2]Doncaster Royal Infirmary NHS Foundation Trust, Doncaster

Dr Shilpa Kaki

Biography
Nephrologist and Acute Physician at Doncaster and Bassetlaw teaching Hospitals NHS Foundation Trust.

Abstract

Introduction: The epidemiology of AKI in hospitalized and critically ill populations has been well described but less is known about AKI in the emergency department (ED) patients. Community-acquired AKI represents about a quarter of AKI events observed in the hospital, and its incidence is increasing. Our aim was to look at the characteristics, early management, triage and outcomes of patients with AKI stage 2 and 3 alerts from a busy emergency department.

Method: A retrospective review of patients with AKI 2 and 3 alerts from ED at Doncaster royal Infirmary (DRI) and Bassetlaw sister units over a 2 month period from August - September 2022 was conducted. All alerts from Ambulatory/SDEC (Same day emergency care) units have been excluded from this study. Data was gathered from trust electronic health system and patient discharge summaries.

Results: 158 AKI stage 2 and 3 alerts were received from ED at DRI and Bassetlaw of which 91 (57.5%) were AKI 2 alerts and 67 (42.4%) were AKI 3 alerts. Average age of patients was 73yrs. Median length of stay in ED was 9hrs (Range 3hrs - 41hrs). 44 (28%) patients died during this hospital episode of which 28 (64%) died in medical wards, 10 (23%) in critical care unit, 5 died in ED and 1 patient died in surgical ward. Average age of patients who died was 70yrs and Median length of stay in ED was no different at 9hrs. 23 (52%) had sepsis as primary cause of death. 8 (18%) who died had active malignancy. 9 (20%) had either end stage heart failure/Liver failure or primary lung condition. 8 (18%) had either Frailty, Old age and/or Dementia listed as contributing to death. 8 (18%) patients were discharged home from ED. Discharge diagnosis was Dehydration and/or Falls. Only 4 of the 8 patients had AKI communicated to Primary care on ED discharge letter. 3 of the discharged patients had hospital readmission within 30 days.

Looking at the initial intervention in ED, all patients had Early warning score and initial resuscitation documented however none of the patients had Fluid balance charted. Bladder scan was performed on 15 (34%) patients where there was high suspicion of obstructive uropathy. Medication as a contributing factor to AKI was commented in 7 (4%) cases.

Out of 106 patients who were discharged from hospital wards, sepsis, community acquired pneumonia, urinary tract infection and gastroenteritis were the commonest discharge diagnosis. Only 2 patients were admitted to specialist Renal ward directly from ED. AKI was communicated to primary care in 70 (62%) patients at discharge. 13 (12%) patients were readmitted to hospital within 30 days of discharge.

Discussion: AKI is a marker of severity of illness and we note significant mortality in patients who present to ED with stage 2 and 3 AKI. Sepsis as expected was commonest cause of death but we note a significant proportion of patients had either active malignancy or severe underlying chronic health condition. With increasing waiting times in ED, early recognition and AKI focussed management is a priority. AKI education for nursing and medical staff in ED and Pharmacy input for patients who spend long hours in ED might help reduce length of overall hospital stay.

Poster number: 194

Submission number: 509

Hospital at Home for patients with Acute Kidney Injury (AKI) in a district general hospital.

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Mrs Karen Nagalingam

Biography
Karen is an Acute Kidney Injury Nurse Specialist at Lister Hospital and also works at the University of Hertfordshire as a Senior Lecturer in Postgraduate Medicine. She is currently working towards her PhD.

Abstract

Introduction

Global trends such as an aging population, the increase of chronic morbidity, soaring costs of health care services and work overload in hospitals, raise the need to find innovative solutions for providing quality health care services. The UK has a relatively low number of hospital beds relative to the population, with only 2.4 beds per 1000 people compared with an average of 5 beds per 1000 in the EU and 7.82 beds per 1000 in Germany (The Kings Fund, 2023). Coupled with staffing shortages, the bed occupancy rates frequently exceed 85%, which is considered the point where safety and efficiency is at risk (BMA 2022). Hospital at Home (HaH) is a virtual service where patients are managed in their own homes. The NHS has been set a target of 40–50 virtual wards per 100,000 people and this is a growing area to help reduce pressures within the hospital setting (Hakim 2023).

Methods

There are currently, 175 alerts for AKI every day within the trust, of which 10-15 are new. It is estimated that AKI costs the NHS in the region of £434- £620 million per year (NICE 2019). In June 2023, an AKI HaH service was established in Hertfordshire and is one of only a few in the UK. The aim is to reduce pressure in the hospital by reducing admissions and prompting quicker discharges.

Results

Between 3-6 patients per week have come through the service with a total of 36 new patients in the last 10 weeks. It is estimated that on average, 49 bed days are saved per month with the introduction of AKI HaH in Hertfordshire. The average cost per day for a stay in hospital is £351 (Guest, Keating et al. 2020) and this equates to a total of £206,388 per annum. Although the costs of HaH are unclear it is cited to be less (Shepperd, Cradduck-Bamford et al. 2022). As the capacity of this service increases, these savings are also likely to grow.

Discussion

The benefits of HaH include optimising patient flow, relieving pressure on hospital bed occupancy and shorter hospital stays. Using this virtual ward has enabled vulnerable adults to be managed in their own environment, potentially improving service user experience and reducing pressure for beds in the hospital.

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Acute Kidney Injury and the risk of death in heart failure patients.

Dr Ella Tumelty[1,2], Dr Isaac Chung[1,2], Mr Nathan Leung[1], Ms Kiana Hillingdon[1], Ms Harshavardhan Addada[1], Ms Lilly Mandarano[3], Dr Irina Chis Ster[4], Dr Lisa Anderson[5,3], Prof Debasish Banerjee[5,2]

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Dr Isaac Chung

Biography
Dr Isaac Chung studied MBBS in St George's, University of London. He is currently completing his Academic Foundation Training at St George's University NHS Foundation Trust. His main interest is in cardiorenal medicine.

Abstract

Introduction

Patients with HF experience frequent hospital admissions, with in-patient mortality of each admission estimated at 10%. Previous literature suggests that renal impairment may be strongly associated with adverse outcomes in HF hospital admissions.

This analysis aimed to explore the relationship between acute kidney injury (AKI) stage and the risk of death in HF patients at our centre over a fifteen-month period.

Methods

Data from a UK tertiary centre teaching hospital were submitted to the National Heart Failure Audit (NHFA) from January 2022 to March 2023. Renal function on admission and in-patient mortality were routinely collected as part of the audit.

Baseline renal function was retrospectively obtained from patient's electronic records. AKI occurrences were collected by reviewing any AKI electronic alerts during the hospital admission. The highest AKI score recorded during an admission was used for analysis.

All patients were followed up until 01/09/2023 and deaths dates were recorded. We have defined a 3-category outcome as death within 30-day from the last discharge, death beyond 30-day from the last discharge and surviving until a median of 386 days (range 157-608).

Results

Between January 2022 and March 2023, there were 843 HF hospital admissions, in 728 individual patients; 635 (87%) had just one admission, 75(10%) had 2 admissions and 18 (3%) had more than 3 admissions. Patients were median age 79 (IQR 19), 53.6% male, 46.2% white, 62.5% hypertensive, 40.8% diabetic and 48.5% had chronic kidney disease.

The relative risk of death for patients who had AKI 1, AKI 2, and AKI 3 compared to no AKI were 2.57 (95% CI 1.61 - 4.10, p < 0.01), 4.68 (95% CI 2.25 – 9.73, p = 0.01), and 8.81 (95% 4.1-18.98, p = 0.01) respectively (Table 1).

The probability of dying within 30 days and after 30 days since the last discharge is presented in Table 2.

Discussion

Heart failure patients who are admitted and suffered from AKI are more likely to die than patients who did not suffer an AKI. Patients with more severe AKI are more likely to die within 30 days since discharge than patients without AKI.

	30 days since the last discharge		
	RR	p-value	95%CI
No AKI (ref)	1.00	-	-	-
AKI1	2.574	<0.001	1.616	4.098
AKI2	4.677	<0.001	2.248	9.729
AKI3	8.809	<0.001	4.088	18.983

Table 1 The effect of AKI stage on the Relative risk of dying within 30 days,

AKI	Died <=30 days since the last discharge			Died >30 days since the last discharge		
	Prob	95%CI		Prob	95%CI	
Stage 0	0.088	0.062	0.115	0.193	0.154	0.233
Stage 1	0.193	0.142	0.244	0.196	0.143	0.248
Stage 2	0.308	0.172	0.443	0.156	0.048	0.265
Stage 3	0.460	0.305	0.615	0.115	0.017	0.212

Table 2 Probabilities of dying within and after 30 days since last discharge.

Poster number: 196

Submission number: 594

Radiological assessment of suspected acute pyelonephritis in the management of urosepsis and prevention of acute kidney injury

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Dr Johnny Thornton

Biography
I am a junior doctor (senior House Officer) in renal medicine

Dr Francis Ward

Biography
Consultant Nephrologist

Abstract

Introduction

Sepsis, a serious complication of infection, may result in organ dysfunction and is responsible for almost 20% of global deaths. Identification of acute pyelonephritis (pyelo), requires early clinical assessment, diagnostics and antimicrobial therapy to prevent septic shock and potential death. In 2022, the American College of Radiology (ACR) published a revised appropriateness criteria for radiological imaging in suspected acute pyelo (1). Five variant [V] categories were defined according to presence of pregnancy, stone disease, renal transplantation, complicated (i.e. recurrent pyelo, DM, immunosuppression) and uncomplicated (first) presentation. The aim of this project was to establish the proportion of patients with suspected acute pyelonephritis undergoing radiological assessment, the selected modality and radiological findings, which could contribute to the diagnosis and management.

Methods

This observational retrospective study of 55 cases with suspected acute pyelo over 6 months. Patients who were decanted to nephrology specialist care from the acute medical take were assessed. Patients were grouped into 5 categories [Variant 1-5] as per appropriateness criteria of the ACR [Table1a]. Patient demographics, renal function and signs of sepsis were recorded. The proportion undergoing radiological assessment, the modality and outcomes are outlined in Table1.

Results

Demographically, 66% of patients were female, the median age was 49 years [IQR 30] and 93.6% were Caucasian. Pre-admission baseline Creatinine (Cr) was 75 umol/l [IQR 75]. Admission Cr was 85 umol/l

[IQR 74}, with peak inpatient Cr 94 umol/l. Sepsis parameters (hypotensive/ tachycardia/ high CRP) on admission were observed in 38% of patients. **Modality Choice** 92.7% of study participants received imaging over the course of their inpatient stay. The primary modality of choice was CTKUB (36.4%), with 25.5% of patients receiving targeted ultrasound. In the setting of uncomplicated acute pyelo (V1), CTKUB was the most common diagnostic modality. Patients with a history of renal calculi (V3) were imaged equally with CTKUB and targeted ultrasound (42.9% CTKUB vs. 42.9% USS). Patients with a history of renal transplant with a native kidney in-situ were most commonly investigated with targeted ultrasound to assess for acute pyelo 92.3%. **Imaging Results** 52.7% of imaging had positive findings. Most frequently recorded was pyelo (23.6%), renal/ureteric calculi (16.4%) and hydronephrosis (12.7%). In presumed uncomplicated acute pyelo (Variant 1), 29% of patients had radiological evidence of pyelo. 22.2% had newly diagnosed renal/ ureteric calculus. 11.1% had hydronephrosis. One patient had both stones and hydronephrosis. In known stone disease, two presented with hydronephrosis [V3]. Two transplant cases had hydronephrosis [V5].

Conclusions

Early detection of pyelonephritis and its underlying aetiology is imperative in the management of urosepsis. Results suggest 22.2% had newly diagnosed renal/ ureteric calculus in those not known to have renal disease [V1]. In total 12% had hydronephrosis, and nearly a quarter had pyelo visible on imaging. No abscesses were observed which guided duration of antibiotic therapy. Early intervention including anti-microbial therapy and management of acute kidney injury were guided by imaging outcomes. Access to specialist services and early imaging is crucial in successful outcomes in urosepsis.

Table 1: Patients with suspected pyelonephritis, the proportion imaged, the radiological modality selected and the radiological findings						
American College of Radiology; ACR Appropriateness Criteria for Acute Pyelonephritis (pyelo)						
Table 1a: Definitions						
Variant 1: First presentation, uncomplicated i.e No history of pyelo, DM, stones, pregnancy, VUR						
Variant 2: Complicated – recurrent pyelo, DM, advanced age, VUR, immunocompromised						
Variant 3: History of renal stones or renal obstruction						
Variant 4: Pregnant with no other complications						
Variant 5: Renal Transplant with native kidneys in-situ						
Demographics						
	Total (n=55)	Variant 1 (n=27)	Variant 2 (n=7)	Variant 3 (n=8)	Variant 4 (n=0)	Variant 5 (n=13)
Female Gender (%)	27 (66)	17 (63)	4 (57.1)	7 (87.5)	0 (0)	4 (30.8)
Age years median [IQR]	49 (30)	41 (34)	68 (40)	45 (26)	0	62 (21)
Ethnicity						
Caucasian (%)	53 (96.4)	25 (92.6)	7 (100)	8 (100)	0 (0)	13 (100)
Black (%)	1 (1.8)	1 (3.7)	0 (0)	0 (0)	0 (0)	0 (0)
Asian (%)	1 (1.8)	1 (3.7)	0 (0)	0 (0)	0 (0)	0 (0)
Creatinine umol/L, median [IQR]						
Baseline Median [IQR]	75 (45)	60 (25)	75 (22)	64 (20)	0	130 (67.5)
Admission	85 (74)	70 (40)	96 (50)	72 (34)	0	153 (104)
Peak	93 (84)	75 (41)	101 (54)	76 (38.5)	0	167 (85)
Features of Sepsis (hypotension +/or tachycardia +/or high CRP)						
Sepsis (%)	21 (38)	11 (40.7)	2 (28.6)	1 (12.5)	0	7 (43.8)
Table 1b: patient demographics with age, baseline, admission and Peak Creatinine as median [IQR]; % patients presenting with features of sepsis (hypotensive/ tachycardia/ high CRP)						
Patients who received imaging and the radiological modalities performed						
	Total (n=55)	Variant 1 (n=27)	Variant 2 (n=7)	Variant 3 (n=8)	Variant 4 (n=0)	Variant 5 (n=13)
No imaging (%)	4 (7.3)	3 (11.1)	0 (0)	0 (0)	0 (0)	1 (7.7)
Imaging (%)	51 (92.7)	24 (88.9)	7 (100)	8 (100)	0 (0)	12 (92.3)
US (%)	14 (25.5)	3 (11.1)	3 (42.9)	0 (0)	0 (0)	8 (61.5)
CT AP (%)	2 (3.6)	2 (7.4)	0 (0)	0 (0)	0 (0)	0 (0)
CT AP with contrast (%)	13 (23.6)	7 (25.9)	3 (42.9)	1 (12.5)	0 (0)	2 (15.4)
CT KUB (%)	20 (36.4)	10 (37)	1 (14.3)	7 (87.5)	0 (0)	2 (15.4)
Other	2 (3.63)	2 (7.4)	0 (0)	0 (0)	0 (0)	0 (0%)
Table 1c: Proportion of patients who had imaging and the modality performed						
Pathological findings on imaging						
No findings (%)	26 (47.3)	10 (37)	5 (71.4)	2 (25)	0 (0)	9 (69.2)
Pyelonephritis (%)	13 (23.6)	8 (29)	1 (14.3)	2 (25)	0 (0)	2 (15.4)
Renal/Ureteric calculus (%)	9 (16.4)	6 (22.2)	1 (14.3)	2 (25)	0 (0)	0 (0)

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Poster number: 197

Submission number: 419

Sustained impact of regional reconfiguration of Nephrology services in reducing delays in transfer of renal patients from spoke hospitals to a renal hub unit.

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Dr Syazril Samani

Biography
Dr Syazril Samani graduated from Queen's University Belfast in 2015, subsequently started his foundation training in NHS Grampian (Aberdeen, Scotland). Following this, he continued his core medical training in Merseyside for 2.5 years and completed training by February 2020. His nephrology career began with appointment as a LAS ST3 Nephrology Registrar in Liverpool followed by successful appointment into the nephrology specialty training programme with flexible portfolio training (Quality Improvement scheme) in August 2022. He is currently working in the Cheshire and Merseyside region as a Renal ST5 Registrar.

Abstract

Acute kidney injury (AKI) affects up to 20% of emergency admissions to acute hospitals. There is variation in incidence, mortality and the way in which care is organised. 73% of centres reported delays exceeding 24h in transferring patients from referring hospitals to renal centres; all experienced an adverse outcome due to these delays (GIRFT Renal Medicine Report, 2021). Between 2019-2022, our nephrology service was comprehensively re-designed with merging of 2 to 1 hub unit allowing more resilient staffing and operational control of larger bed base, spoke centre hybrid consultants providing local AKI services 5 days per week, and novel ambulatory discharge pathways. The new renal hub unit serves a population of 1.06 million people with 4 main referring spoke centres. The early favourable impact of the reconfiguration on patient outcomes were presented in 2023: we have evaluated the sustainability of these gains and report further outcome data from May to July 2023.

We performed a retrospective study looking into the hub unit performance over 3 months from May to July 2023 and comparing with baseline data from mid-October 2022 to January 2023. Data are obtained from a cohort of patients transferred from the spoke centres to the hub unit with either severe AKI or on chronic haemodialysis. We collected mean transfer time, safety of transfers using an objective checklist, critical care (CC) bed usage, use of ambulatory services to facilitate discharge, and readmission rates within 30 days. We are in the process of reviewing a full year's data using the same method. Key findings are summarised in Table 1.

	Baseline data at merge (mid-Oct 2022 to Jan 2023)	Next 3 months (May to July 2023)
Mean transfer time (hours) [Baseline data 2018 - 4.9 days]	26.2 hours (1.08 days)	26 hours (1.08 days)
Safety of transfers (%)	92	98.7
Median hub unit length of stay (days)	10.1	8
Percentage of patients admitted to CC for single organ support pre-transfer (%)	9	14.7
Readmission rate within 30d (%)	12.7	20
Use of new ambulatory services following discharge (%)	20.9	28

Table 1: Hub unit performance following service reconfiguration

Service reconfiguration have shown sustained reduction in the delays in care (and the risk of adverse outcomes) for renal patients needing transfer to the hub unit as shown in table 1. The median length of stay has significantly improved. There had been an increased use of CC beds for single organ support in the summer; 10 out of the 11 patients had unavoidable acute indications for dialysis at presentation therefore were deemed unsafe for transfer. Further data will be published at UKKW 2024. The goal is to further reduce any inappropriate misuse of CC beds at spoke centres. Next step would be to set up a collaborative work with the ambulance services to consider direct conveyance of known dialysis patients to the renal hub unit

References

GIRFT renal medicine report 2021 Layout 1 (gettingitrightfirsttime.co.uk)

Poster number: 198

Submission number: 415

Experience of using dapagliflozin in kidney transplant recipients

Mr Gareth Bryant, Miss Alice Coles, Mr Robert Bradley

Cardiff and Vale University Health Board, Cardiff

Mr Gareth Bryant

Biography
Gareth has been a specialist pharmacist in nephrology and transplant in Cardiff and Vale University Health Board for 8 years. His research interests include: post transplant infections, immunosuppression adherence, management of peritoneal dialysis infections and cardiorenal optimisation. He has contributed to national guidelines, such as the clinical practice guideline: anaemia of chronic kidney disease, as well as being a lecturer in the Welsh School of Pharmacy and Pharmaceutical Sciences.

Abstract

Introduction
SGLT2is have been proven to have cardiorenal benefits in patients with chronic kidney disease (CKD), reducing the risk of cardiovascular disease and heart failure in those with or without diabetes. In addition to this, trials have shown that they reduce the rate of CKD progression in patients with proteinuria. (1) However, in the clinical trials kidney transplant recipients (KTRs) were excluded from the study population. The reported benefits of these drugs in CKD patients has raised questions about whether cardiorenal optimisation in KTRs is also supported. Due to the lack of trial data, there is uncertainty around the increased risk of side effects in KTRs including urinary tract infections, genital thrush, Fournier's gangrene, diabetic ketoacidosis, hypovolaemia and an acute decline in kidney function. In our local centre, carefully selected KTRs have been initiated on SGTL2is, with close monitoring, to be able to gather more information about the incidence of these adverse effects.

Methods
Patients were referred to the weekly transplant MDT meeting to discuss appropriateness of SGLT2i therapy and to assess the risk of side effects. Diabetic and non-diabetic patients with proteinuria could be referred, as well as those patients under cardiology for treatment of heart failure. Those patients without proteinuria or heart failure were excluded, to initially target the highest risk patients. All patients were required to be on maximum tolerated dose of RAASi before trialling an SGLT2i. If appropriate, patients would receive counselling from our outpatient transplant pharmacy team prior to initiation. The pharmacy team would monitor the patient over a 6-month period. During this period, the patient was questioned about any potential side effects, including urinary/genital infections. eGFRs were also recorded alongside the trend of proteinuria.

Results

As of January 2024, 10 KTRs had been started on dapagliflozin 10mg daily. Of the 10 patients, 7 patients were initiated on dapagliflozin with proteinuria and 3 were initiated via cardiology as part of their heart failure treatment. All patients were on maximum tolerated doses of RAASi before SGLT2i initiation. Two patients had a previous history of recurrent UTIs, which was considered before initiation. One of these patients had subsequently experienced two separate episodes of UTI since starting dapagliflozin, yet no patients experienced any other side effects. We observed no decrease in eGFR after initiation in 9 of our patients, with an average of 56% decrease in proteinuria levels. However, one patient experienced a 50% decrease in eGFR with a 75% increase in proteinuria after 3 months of treatment.

Discussion

Although a small cohort of KTRs had been initiated on a SGLT2i, the results demonstrate minimal adverse effect reporting. This is consistent with the DAPA-CKD trial, where a low incidence of UTIs and genital infections were reported. (1). There was no significant difference seen in the DAPA-CKD trial in incidence in AKI vs placebo, however a temporary drop in eGFR is initially seen, which subsequently stabilises. The one patient who had a decrease eGFR will continue to be monitored and investigated for graft rejection.

The approach of an MDT review and monitoring system in our KTR population has allowed us to gather more information about adverse effects, whilst ensuring patients are able to receive the benefits of these pharmacotherapies. This helps to endorse the safety of SGLT2is in KTRs in the future.

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Poster number: 199

Submission number: 437

The diagnosis and management of iron deficiency in people with chronic kidney disease: Perspectives from a UK modified Delphi panel

Dr Fozia Ahmed[1], Professor Sunil Bhandari[2], Professor John Cleland[3], Dr Fraser Graham[3], Dr Matt Hall[4], Professor Paul Kalra[5], Professor Philip Kalra[6], Dr Kate Stevens[7], Professor David Wheeler[8], Professor Simon Williams[1]

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Professor Sunil Bhandari

Biography
Consultant Nephrologist at Hull University Teaching Hospitals NHS Trust, Honorary Clinical Professor at the Hull York Medical School, Vice President of Royal College of Physicians Edinburgh, Deputy Head of School of Medicine Health Education England Yorkshire and Humber, and CO Chair of UK Kidney Research Consortium.

Abstract

INTRODUCTION:

There is considerable uncertainty about which markers of ID are best suited for diagnosis, and which best identify those patients most likely to benefit from treatment. Consequently, management of ID is often sub-optimal.

METHODS:

From September to December 2023, a three-stage expert Delphi panel was conducted. The primary objective was to develop a cross-specialty UK consensus regarding best practice recommendations for ID screening and management in people with cardio-renal conditions, including CKD or HF.

- Stage 1: questionnaire
- Stage 2: individual interviews
- Stage 3: group consensus meeting with the entire panel

Five nephrologists and five cardiologists participated in all stages. This abstract reports on the panel's perspective on current clinical practice and the optimal diagnosis of ID, with a particular focus on the opinions of nephrologists managing patients with CKD.

RESULTS:

The combined panel mostly agreed, 80% (8/10) including 4/5 nephrologists, that patients should be screened for ID independently of anaemia. Tests used for the diagnosis of ID included TSAT (100% of nephrologists agreed this was an important indicator of ID), serum ferritin (80%), and haemoglobin (80%). Other tests deemed important by nephrologists included CHr (80%), HRC (20%), serum iron (40%), and haematocrit (40%).

All nephrologists indicated they would consider a diagnosis of ID when TSAT was <20%, although some would use a higher threshold of 25%. Only 60% of nephrologists considered a serum ferritin of <100µg/L to indicate ID in non-dialysis dependent CKD. Opinions varied as to the haemoglobin values considered clinically relevant, with a median threshold of 120 (range: 100-135g/l). These values differed for ESA-treated and ESA-naïve patients. Other diagnosis thresholds included 31 or 31.5 pg for CHr (used by 40% of nephrologists), 6% for HRC (20%), and 10 µmol/L for serum iron (20%).

Thresholds for predicting response to treatment of ID were also discussed. The thresholds used to diagnose ID were often different from those used to initiate treatment. The nephrologists agreed that target levels for some markers could vary depending on whether someone was receiving dialysis or ESA therapy, and that chronic disease (including CKD and HF) complicate the interpretation of some iron markers.

Most (80%) of the combined panel (8/10) agreed that treatment targets and diagnosis thresholds might also vary for patients with CKD compared to HF, and that greater simplicity on thresholds for defining and treating ID was required across specialties.

CONCLUSION:

While TSAT, serum ferritin, and haemoglobin were highlighted as key indicators, the varied importance placed on additional tests highlights the diagnostic complexity of ID. The panel agreed that a consistent approach across all specialities would be beneficial but that further research is needed to validate this approach in different patient populations.

Take-home messages

(i) Experts look at a number of ways to assess iron status in CKD, but thresholds are often not uniformly consistent.

(ii) There is consistent agreement that TSAT <20% indicates ID.

(iii) Thresholds might also vary for patients with CKD compared to HF, and for those on dialysis or ESA therapy.

Abbreviations: CHr, Reticulocyte Hb content; CKD, Chronic kidney disease; ESA, Erythropoietin stimulating agent; Hb, Haemoglobin; HD, Haemodialysis; HF, Heart failure; HRC, Hypochromic red cells; ID, Iron deficiency; TSAT, Transferrin saturation.

Poster number: 200

Submission number: 446

Practice pattern of use of sodium zirconium cyclosilicate in acute hyperkalaemia in hospitalized patients

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Dr. Aarthi Muthukumaran

Biography
I am working as a Locum Consultant in Renal Medicine at Imperial College Healthcare NHS. I finished my MBBS (2006-12, Stanley Medical College), Internal Medicine (2013-16, St. John's Medical College) and Nephrology (2017-20, Madras Medical College) in India. I worked as a Consultant in a tertiary care multi specialty hospital and as a teaching faculty in a government medical college in India (2021-22) and as a Senior Clinical Fellow in Renal Medicine at Imperial College Healthcare NHS in 2023. My areas of interest include glomerulonephritis, obstetric nephrology and onconephrology. I have completed the ISN-ANIO (International Society of Nephrology - American Nephrologists of Indian Origin) Nephropathology Certificate program (2019-20), NSMC (Nephrology Social Medical Collective) program (2021-22) and GLOMCON fellowship (2022-23). I am passionate about teaching medical students, registrars and dialysis nurses. I have presented my research papers in Indian national conferences, at the World Congress of Nephrology and have published articles on 'Pregnancy outcomes in renal transplant recipients', 'The role of psychosocial factors in depression and mortality among urban hemodialysis patients' in KI reports.

Abstract

Introduction: There are increasing number of people with cardiorenal metabolic disease who require treatment with inhibitors of the renin angiotensin aldosterone system. These individuals have a greater risk of hyperkalaemia and this is manifested in the number of people who present with hyperkalaemia in a hospital setting. The introduction of novel potassium binders such as sodium zirconium cyclosilicate (SZC) provides an effective treatment of hyperkalaemia with less associated complications such as hypoglycaemia seen when insulin and dextrose are utilised. However, there is lack of clarity as to how one should use SZC in the acute setting. The aim of this study was to determine the use of SZC in acute hyperkalemia settings during hospitalization.

Methods: A retrospective analysis of case records of patients, who had received SZC during their admission to the medical wards of a tertiary care NHS trust, between Aug and Oct 2023 and the prescription pattern of ACE inhibitor (ACEi), angiotensin receptor blocker (ARB), ARNI, MRA and SZC were noted.

Results: A total of 101 patients were selected as study population by consecutive sampling and were stratified into two categories as follows.

Study population receiving SZC between Aug and Oct 2023
N = 101

Those requiring urgent reduction in hyperkalemia

Potassium ≥ 6.5mmol/L or > 6mmol/L and significant ECG changes suggesting that life-threatening arrhythmias are imminent

n = 23

Those requiring non-urgent reduction in hyperkalemia

Potassium ≥ 5.5mmol/L and < 6.5mmol/L and no significant ECG changes suggesting that life-threatening arrhythmias are imminent.

n = 78

The prevalence of diabetes was 42.4% and heart failure was 26.7% in our cohort. People with a wide spectrum of renal function were included in the study.

Spectrum of renal function

- 6.90%
- 5.90%
- 17.80%
- 19.80%
- 35.60%
- 6.90%
- 6.90%

■ Acute kidney injury
■ Acute kidney injury on chronic kidney disease
■ Chronic kidney disease
■ No renal impairment
■ Hemodialysis
■ Peritoneal dialysis
■ Renal transplant
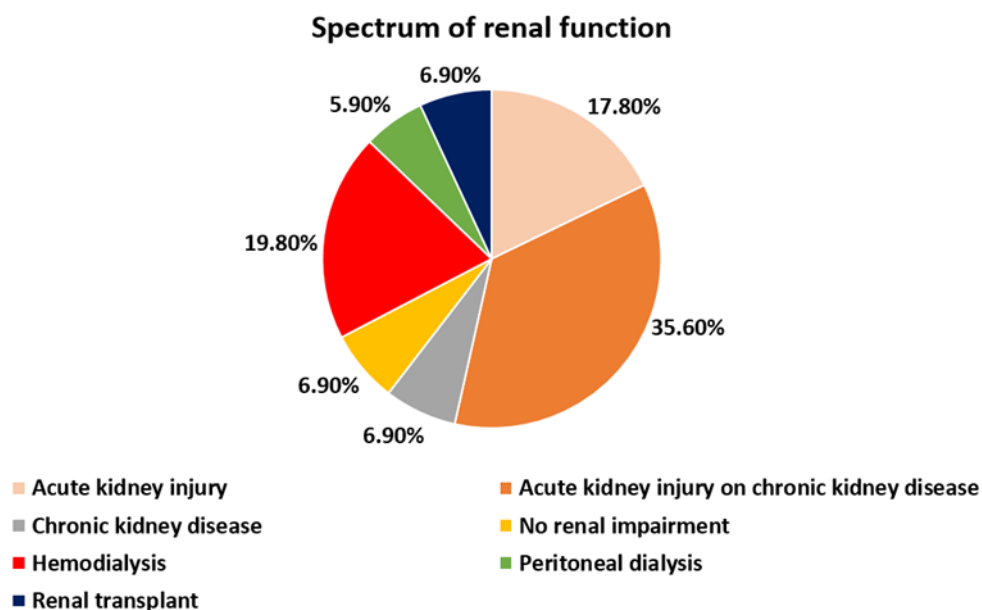
The dosing pattern of SZC varied from 5g once a day to 10g thrice a day. There was a significant positive correlation between the potassium level at the time of presentation and dosage of SZC used in the first 24 hours (r = 0.454, p value < 0.00001).

Table 1: Comparison of characteristics of patients requiring urgent and non-urgent correction of hyperkalemia with sodium zirconium cyclosilicate (SZC)

S. No.	Variables	Urgent reduction of hyperkalemia N = 23 % (n)	Non-urgent reduction of hyperkalemia N = 78 % (n)	p value
1	Diabetes No diabetes	65.2 (15) 34.8 (8)	55.1 (43) 44.9 (35)	0.39
2	**Spectrum of renal function:** Acute kidney injury (AKI) Chronic kidney disease (CKD) AKI on CKD No renal impairment Hemodialysis Peritoneal dialysis Renal transplant	 26 (6) 0 39.1 (9) 4.4 (1) 17.4 (4) 4.4 (1) 8.7 (2)	 15.4 (12) 9 (7) 34.6 (27) 7.7 (6) 20.5 (16) 6.4 (5) 6.4 (5)	0.68
3	Heart failure No heart failure	26 (6) 74 (17)	26.9 (21) 73.1 (57)	0.94
4	Concomitant hyperkalemic medication use No hyperkalemic medicine	43.5 (10) 56.5 (13)	42.3 (33) 57.7 (45)	0.92
5	**Anti-hyperkalemic measures:** Inj. Calcium gluconate Inj. Insulin dextrose Salbutamol nebulization Oral or iv sodium bicarbonate	 87 (20) 87 (20) 60.9 (14) 43.5 (10)	 18 (14) 21.8 (17) 18 (14) 18 (14)	0.62
6	Renal advice sought for hyperkalemia management Yes No	 56.5 (13) 43.5 (10)	 39.7 (31) 60.3 (47)	0.15
7	Median frequency of monitoring of potassium level in first 24 hours of use of SZC	3 (2,5.5)	2 (1,3)	**<0.0001**
8	Median time taken for normokalemia to occur (hours)	32 (17.25, 78)	24 (23, 48)	0.47
9	Mean potassium level at the time of initiation of SZC (mmol/L)	6.77 ± 0.61	5.85 ± 0.43	**<0.0001**
10	Median dose of SZC used in the first 24 hours (g)	30 (30,30)	17.5 (10,30)	**0.0005**
11	SZC appropriately stopped after normokalemia Yes No	 45.5 (10) 54.5 (12)	 52.6 (40) 47.4 (36)	0.55

Median values with inter-quartile ranges, mean values with standard deviation.

Only 50.5% (50 out of 99) of patients had SZC appropriately stopped after normokalaemia was achieved and 13.9% (n=14) developed hyperkalaemia after stopping SZC requiring reinitiation whilst in hospital. Of the 49.5% patients who were continued on SZC even after normokalaemia was attained, 9.8% developed hypokalaemia.

Prescription pattern of hyperkalemic medications and sodium zirconium cyclosilicate after an episode of hyperkalemia during hospitalization

- ■ Prescription at the time of admission
- ■ Percentage of prescription restarted at the time of discharge
- ■ Sodium zirconium cyclosilicate prescription at time of discharge
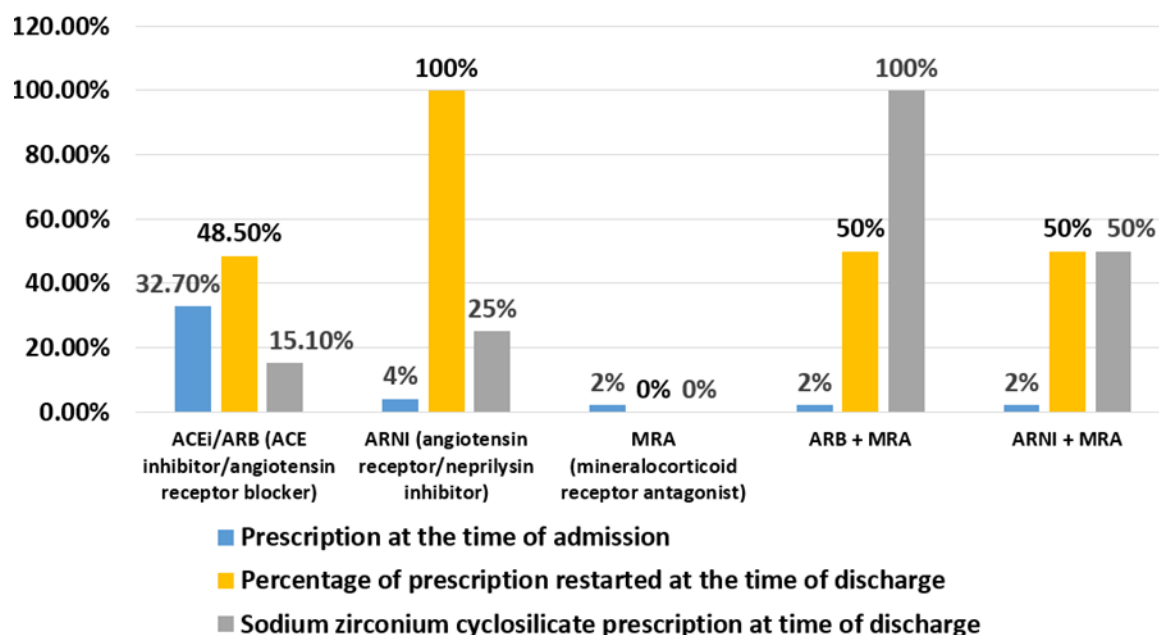
Discussion: At the time of hospital admission, 43 patients were on cardiac and renal protective agents such as ACEi/ARB (32.7%), ARNI (4%), spironolactone (2%), ARB + MRA (2%) and ARNI + MRA (2%). When they were treated for acute hyperkalaemia whilst in hospital with SZC, 76.7% of them had their above regular medications stopped. However, only 48.5% of those who were on ACEi/ARB had these restarted at the time of discharge, with the concomitant use of SZC in 15.1% of them. Proportion of people who were restarted on ARNI, ARB+MRA, ARNI+MRA drug combinations, after normokalaemia was achieved, was much better at 100%, 50% and 50% respectively. We conclude that better utilization of potassium binders is needed to facilitate improved use of cardio-renoprotective drugs and appropriate check mechanisms need to be developed at the same time to avoid the unnecessary prolonged use of SZC.

Roxadustat (Evrenzo) for the treatment of anaemia in chronic kidney disease patients, a single unit experience

Mrs Bindu Skaria, Dr Zoe Pittman

University Hospitals Of Derby And Burton NHS Foundation Trust, Derby

Mrs Bindu Skaria

Biography

The author has more than 20 years renal nursing experience. Prior to committing full time into a renal anaemia specialist nurse role, the author has been working in a busy renal medicine for many years looking after patients with Chronic Kidney Disease, patients on dialysis treatment as well as follow up care for kidney transplant recipients. In addition the author has been involved in teaching patients, carers , the wider MDT and medical and nursing students.

Abstract

Introduction

Anaemia is a condition where the amount of red blood cells or haemoglobin is lower than normal. Anaemia is a common complication of chronic kidney disease (CKD). It may start early in CKD but becomes more severe as the disease progress due to lack of erythropoietin and iron deficiency. Around 1 in 7 people with CKD develop anaemia, as well as causing physical symptoms like weakness lack of energy and breathlessness anaemia can affect the emotional wellbeing of a person. Anaemia can be improved with the right treatment and appropriate monitoring. The role of the Clinical Nurse Specialist (CNS) is vital in this to enhance better patient experience as well as to improve the quality of life.

Historically renal anaemia was managed with injectable erythropoietin but the recent introduction of Roxadustat gives the option for oral treatments. The introduction of oral medicine was welcomed by patients, especially-those who struggle to administer injections/or who have a needle phobia.

Roxadustat is a hypoxia inducible factor prolyl hydroxylase inhibitor (HIF-PHI), which stimulates a coordinated erythropoietic response thereby increasing haemoglobin level also optimize iron metabolism by reducing hepcidin levels. Roxadustat is licenced for the treatment of symptomatic anaemia associated with chronic kidney disease to achieve and maintain their recommended haemoglobin (Hb) level of 100 -120 g/l. Hb level should be monitored two weekly until target Hb is achieved and stabilised.

Method

Roxadustat was introduced in our pre dialysis population in November 2022. The recommended dose for patients not currently treated with an ESA was 70 mg x 3 per week for body weight < 100 kg and 100 mg x3 per week for > 100 kg body weight. We started 13 patients on Roxadustat between November 2022 and November 2023. Eight patients were Epo naïve, and five patients were converted from other ESA preparations. Hb was monitored every two weeks to measure the effectiveness.

Some patients had a quick response to the medication and Hb levels were above target range within 4-6 weeks of starting the medication. Medication was held till Hb level dropped within target range before restarting on reduced dose as per recommendation.

Result

No of pts	Previous ESA -Y/N	Starting Hb	Week2	Week 4	Week 6	Week 8
1	N	96	108	120	125	127
2	N	102	123	136	124	116
3	N	96	115	120	125	140
4	N	96	99	122	127	140
5	N	103	129	127	123	135
6	N	102	110	112	124	
7	N	90	105	111	124	128
8	N	94	100	97	99	108
9	Y	113	132	123	115	116
10	Y	90	105	99	109	114
11	Y	74	81	94	97	101
12	Y	81	82	92	78	80
13	Y	97	101	99	103	103

Discussion

The dose of Roxadustat should be individualised to achieve and maintain target HB level. As we observed in our small group of patients (40 % of patients) overshot Hb within 4-6 weeks of initiation of treatment. We revised our policy to start on a lower dose than the recommended to avoid sudden increment in HB level and possibility of developing complications.

Poster number: 202

Submission number: 526

Sodium Zirconium use in the management of hyperkalaemia at Royal Wolverhampton NHS Trust

<u>Dr Mughees Zahid</u>[1], Dr Manivarma Kamalnathan[2], Dr Jyothi Kondlapudi[2], Dr Charllotte Stephens[3], Dr Jibrin Hussaini[2]

[1]Russells Hall Hospital, Dudley. [2]New Cross Hospital, Wolverhampton. [3]Queen Elizabeth Hospital, Birmingham, Birmingham

Dr Mughees Zahid

Biography
I am a renal medicine trainee registrar in the West Midlands Deanery.

Abstract

Introduction: NICE has issued guidance on the use of Sodium Zirconium in the management of hyperkalaemia in 2019, but there remains a wide variation in clinical practice. An initial audit was undertaken to determine the practice of the use of Sodium Zirconium in the management of hyperkalaemia in the year 2021 at Royal Wolverhampton NHS Trust. A reaudit was undertaken in 2023 to determine if there has been a change in practice since the last audit and if this meets the NICE recommendations.

Methodology: A retrospective observational study was undertaken using electronic pharmacy prescription ePMA. Data was collected of the number of patients on Sodium Zirconium over a one month period from February 2023 to March 2023. Twenty seven patients were noted to be on the medication but only twenty five were included in the audit as electronic records were unavailable for two patients. Data was collected on patient demographics, comorbidities, serum K+ levels at the start of treatment & after 72 hours and the dosage of Sodium Zirconium along with length of treatment. Information was also gathered regarding follow up plan of patients discharged home on Sodium Zirconium.

Results: The data showed that twenty three patients were prescribed Sodium Zirconium for managing acute hyperkalaemia, one to manage chronic hyperkalaemia and one to prevent hyperkalaemia.

In the acute hyperkalaemia treatment group only nine patients had serum potassium of 6.5 mmol/l or above. Only two out of these nine patients (22%) were given Sodium Zirconium as part of the initial management of acute hyperkalaemia. Twenty two out of the twenty five (88%) patients had serum potassium of less than 6 mmol/l at 72 hours post treatment. Twenty one out of twenty three (91%) patients in the acute hyperkalaemia group were given a dose of 10 grams thrice daily in the correction phase. Two out of the twenty five (8%) patients treated with Sodium Zirconium had an episode of hypokalaemia whilst on treatment. No harm was reported to these patients due to their hypokalaemia and Sodium Zirconium was stopped after first episode of hypokalaemia in both the patients. Eighteen

out of twenty-five patients given Sodium Zirconium had AKI. Nine out of twenty five patients treated with Sodium Zirconium were on RAAS inhibitor at the time of the hyperkalaemia episode and only two patients had their RAAS inhibitor restarted on discharge.

Only one patient was discharged on Sodium Zirconium and there was no plan for serum potassium monitoring post discharge.

Discussion: There has been an increase in the use of Sodium Zirconium at our trust since the initial audit (21 patients over 90 days in the previous audit). The correct dose of Sodium Zirconium was given to the majority of the patients. However, the medication is being given to patients with lower serum potassium level than recommended by NICE. Following the audit, the trust guidelines have been updated to include Sodium Zirconium in the management of acute hyperkalaemia.

References

https://www.nice.org.uk/guidance/ta599

Poster number: 203

Submission number: 584

An overview of the role of a pharmacist in a multi-disciplinary surgical pre-assessment clinic in kidney transplantation.

Miss Aisha Riaz

Guy's and St Thomas' NHS Foundation Trust, London

Miss Aisha Riaz

Biography
Aisha Riaz is the Highly Specialist Renal Transplant pharmacist at Guy's and St Thomas' NHS Foundation Trust and is responsible for prescribing for renal transplant patients and provides a pharmacy clinic to kidney donors and recipients awaiting surgery and for patients who are post-transplantation. She has a specialist interest in adherence to drug therapy, drug therapy associated with HIV transplantation, and hepatitis B and C in the transplantation population. She is currently a member of the UK Renal Pharmacy Group.

Abstract

Introduction

Pharmacists play a vital role in optimising medicines in potential recipients for kidney transplantation and donation. Studies have reported pharmacists have a positive impact on medication management through a surgical pre-assessment clinic (PAC)[1]. The current service provision is through a multi-disciplinary clinic. The role of the pharmacist includes undertaking an accurate medication history, management of immunosuppression dosing, providing advice to patients and healthcare professionals and counselling patients on medications in the peri-operative period. The aim of this service review was to determine the impact and role of a pharmacist in the surgical PAC in the renal transplant population.

Methods

Data was collected retrospectively between January 2022 – December 2022 using electronic health records. A data collection tool included the number of patients reviewed by a pharmacist, the number of patients counselled on their medications along with information on medications prescribed, prescriptions written by a non-medical prescribing (NMP) pharmacist and type of pharmaceutical intervention. All data was anonymised.

Results

There were 176 surgical pre-assessment patients who underwent surgery between January 2022-December 2022. N=166 (94%) patients were reviewed by a pharmacist in a surgical PAC. Of these, n=67 (40%) were live related kidney recipients and n=99 (60%) were kidney donors. N=166 (100%) of patients reviewed by a pharmacist were counselled on their medications, table 1. NMP pharmacists prescribed

immunosuppression in n=29 (43%) of kidney recipients, table 1. The most frequent pharmaceutical intervention made was perioperative medicines management with advice given to patients about holding medication pre-operatively, table 1. In kidney recipients, the most frequent pharmaceutical intervention was advice on dosing immunosuppression and complex treatment plans, table 1. The estimated time required for a consultation per patient for kidney donors was approximately 10 minutes and for kidney recipients was 40 minutes.

Conclusion

This service review highlights the successful number of pharmaceutical interventions by pharmacists during a multi-disciplinary surgical PAC in potential kidney donors and recipients. Involvement in the PAC increases the pharmacist workload however with a projected increase in the number live related donations and transplants for 2024 the role of a pharmacist is integral to medicines optimisation in the peri-operative period.

Table 1. Pharmaceutical Interventions

Patients Reviewed by Pharmacist (N=166)	**Donor** (N=99)	**Recipients** (67)
Medications		
Number of patients counselled, N (%)	99 (100%)	67 (100%)
Number of prescriptions written, N (%)	0 (0%)	29 (43%)
Average number of medicines prescribed by GP/hospital reviewed, Mean	1	9
Average number of medicines bought over the counter reviewed (OTC), Mean	1	1
Pharmaceutical Interventions		
Lifestyle advice given, N (%) • *Smoking cessation, alcohol intake, recreational drug use*	7 (7%)	5 (7%)
Advice on dosing immunosuppression, N (%)	0 (0%)	14 (21%)
Advice about holding medications pre-operatively N (%) • *Homeopathic/herbal medications, contraception*	23 (23%)	6 (9%)
Complex treatment plans, N (%) • *Bespoke protocols, anticoagulation plans, swallowing difficulties, Interactions.*	3 (3%)	13 (19%)
Follow up required post PAC, N (%)	1 (1%)	16 (24%)

References

1. George WJL, Senturk-Raif R, Hodgkinson RM, Emmerton M, Larmour I. Impact of a Surgical Preadmission Clinic Pharmacist on the Quality of Medication Management from Preadmission to Discharge: a Randomised Controlled Study. *Journal of Pharmacy Practice and Research*. 2011; 41 (3):212-216.

Poster number: 204

Submission number: 593

Initiation and monitoring of cinacalcet in haemodialysis cohort

Mr Simranjeet Singh Grewal[1], Dr Isaac Chung[2,1], Mr Rouven Calayag[2], Dr Rosa Montero[2,1]

[1]St George's, University of London. [2]Renal Medicine, St George's University Hospital NHS Foundation Trust

Mr Simranjeet Singh Grewal

Biography
Mr Simranjeet Singh Grewal is studying MBBS in St George's, University of London. He has an interest in renal medicine and medical research.

Abstract

Introduction

Cinacalcet is used in end-stage renal disease (ESRD) populations to manage secondary hyperparathyroidism. National Institute of Clinical Excellence (NICE) recommends cinacalcet for refractory secondary hyperparathyroidism for ESRD patients with parathyroid hormone levels > 85 pmol/L. NICE recommends monitoring regularly with dose escalation as appropriate. Treatment should only be continued if there is a reduction in plasma levels of PTH of > 30%.

Our aim is to assess the adherence to guidelines regarding initiation and monitoring of cinacalcet prescriptions in our local tertiary hospital.

Methods

Our team consists of a medical student, academic foundation doctor, renal database manager, and a consultant nephrologist. Hemodialysis patients who were started on cinacalcet between 2016-2022 were identified by searching through electronic patient records (EPR). Guideline adherence was identified by searching through documentation, prescriptions, and blood tests within EPR. All PTH blood tests for ESRD patients identified on cinacalcet were pulled out of our hospital renal database to allow analysis.

Results

Within our 344-patient dialysis cohort, there were 44 patients on cinacalcet. 37 (84%) patients were initiated on cinacalcet with PTH > 85 pmol/L (Figure 1). Only 2 (5%) had their doses of cinacalcet increased within 2-4 weeks (Figure 1). 26 (59%) patients had their PTH checked every 1-3 months. 30 (68%) patients had their calcium checked monthly. Finally, only 23 (52%) patients have had their cinacalcet increased in response to persistently raised PTH levels.

Graphing data of PTH levels from 300 days before cinacalcet start and 600 days after, PTH does not appear to be change after cinacalcet prescription (Figure 2). This may be due to poor dose escalation of cinacalcet.

Discussion

Our center has followed NICE guidelines in initiating cinacalcet in the vast majority of the time. However, there is lower adherence to monitoring and dose escalation regarding PTH. The lack of dose escalation makes it difficult to determinewhether treatment discontinuation is well adhered to as lack of treatment response may be due to doses.

We are currently acting by amending the local protocol of cinacalcet use and educating staff in hemodialysis centers regarding monitoring and dose escalation recommendations for cinacalcet by NICE.

Our team plans to complete a further PDSA cycle in 3 months.
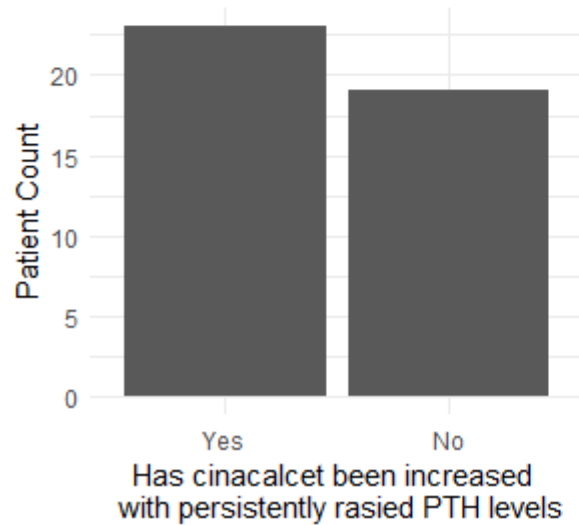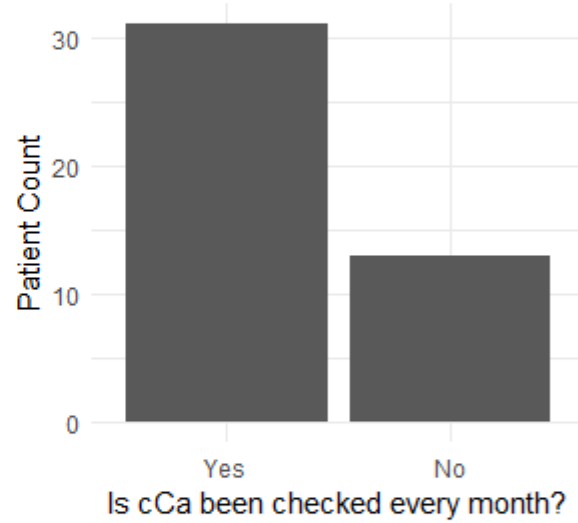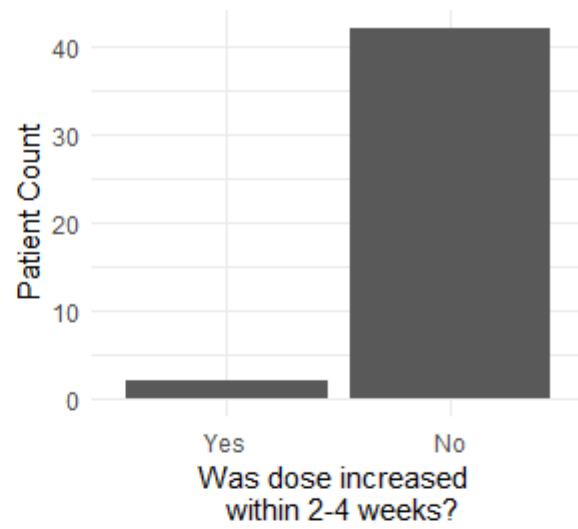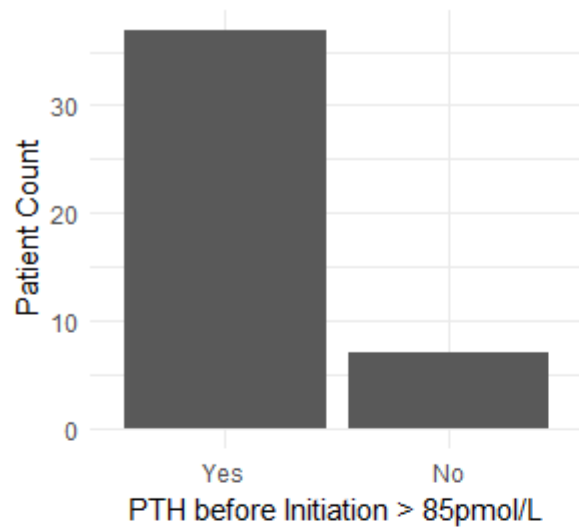
Figure 1 Bar Chart showing Adherence to NICE Guidelines
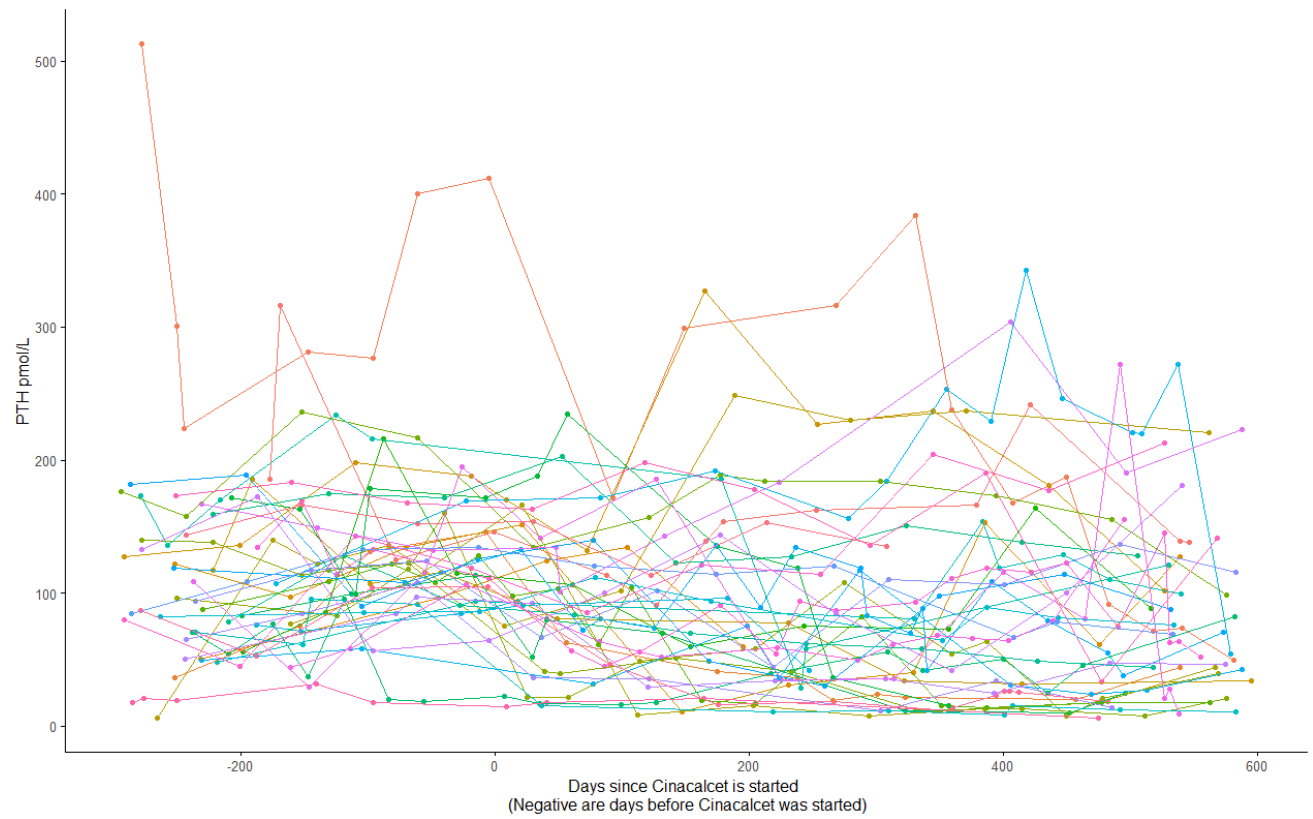
Figure 2 All PTH levels measured between 300 days before and 600 days after cinacalcet was initiatied.

Poster number: 205

Submission number 465

Body composition and multimorbidity in patients with chronic kidney disease

Dr Ashveer Randhay[1,2], Khushbakht Kokab[3], Farrah Khan[3], Professor Nicholas Selby[1,2], Professor Maarten Taal[1,2], Dr Tarek Eldehni[1,2]

[1]Centre for Kidney Research and Innovation, University of Nottingham, Derby. [2]University Hospitals of Derby and Burton NHS Foundation Trust, Derby. [3]School of Medicine, University of Nottingham, Nottingham

Dr Ashveer Randhay

Biography
Ashveer is a higher specialty trainee in Renal Medicine in the East Midlands deanery. He is currently out of programme working as a clinical research fellow in Centre for Kidney Research and Innovation, University of Nottingham. His clinical interests include body composition in patients with kidney disease, kidney transplantation and kidney health in pregnancy.

Abstract

Introduction

Frailty and multimorbidity are increasingly prevalent, particularly in the chronic kidney disease (CKD) population, and they seem to be more pronounced and accelerated in people receiving haemodialysis. We aimed to study the relationship between body composition, frailty and multimorbidity in people with CKD and end stage renal disease (ESRD) on haemodialysis (HD).

Methods

This was a single centre study, involving 42 patients with CKD stage 3 to 5 (pre-dialysis) and 29 patients receiving in-centre haemodialysis. InBody 770 was used to measure body composition using bioelectrical impedance analysis. Multimorbidity of participants were assessed using the simplified Cambridge multimorbidity score. Frailty assessment was performed using the Clinical Frailty Scale.

Results

Phase angle was lower in later stages of CKD - mean phase angle in CKD stage 3 was 5.28°, stage 4 was 4.44 and stage 5 was 4.13 (p=0.008). Visceral adiposity correlated with multimorbidity scores but in a multivariate regression analysis (including albumin and visceral fat area) only whole body phase angle independently predicted multimorbidity in CKD stage 4-5 (adjusted R^2 for the whole model = 0.47, p = 0.007). In haemodialysis patients, there was no correlation between multimorbidity and phase angle (r=-0.149, p=0.441). However, there was a significant correlation between frailty score and whole body

phase angle in this group (r=-0.559, p=0.002). In a univariate analysis, age (R^2 = 0.2, Beta = 0.045, p = 0.015), albumin (R^2 = 0.217, Beta = -0.214, p = 0.009) and skeletal muscle mass (R^2 = 0.282, Beta = -0.101, p = 0.003) predicted frailty score in haemodialysis patients. In multivariate regression analysis age, albumin level and skeletal muscle mass continued to independently predict frailty scores in HD patients (adjusted R^2 for the whole model = 0.503).

Discussion

Phase angle measurement refers to cell membrane integrity and fat-free mass, with higher values suggesting improved cell health. Using body composition measures, in particular phase angle, is a useful measure to predict multimorbidity and frailty in CKD patients. They are quick, accessible and easy to use tools that can be incorporated in clinical practice routinely. The relationship between visceral adiposity and multimorbidity merits further investigation. Preservation of skeletal muscle mass through nutritional and exercise interventions could be a clinical target to reduce frailty in this population.

Poster number: 206

Submission number: 135

The lived experience of informal caregivers of people receiving conservative management: The ACORN Study.

Dr Claire Carswell[1,2], Dr Trisha Forbes[1], Ms Gladys Laurente[1], Professor Helen Noble[1]

[1]School of Nursing and Midwifery, Queen's University Belfast. [2]Department of Health Sciences, University of York

Dr Claire Carswell

Biography
Dr Claire Carswell is an NIHR Advanced Research Fellow and a registered mental health nurse. Her research focuses on the intersection between mental and physical health.

Abstract

Introduction:

Living with kidney failure has a wide impact, affecting not only patients but also their informal caregivers. Patients opting for conservative management and deciding not to have dialysis, endure challenging physical and psychological symptoms, and social and spiritual consequences of their condition. Informal caregivers of patients opting for conservative management can also so experience substantial caregiver burden, adversely affecting their health. However, there is limited guidance on how best to support informal caregivers, and currently scant evidence exists regarding effective psychosocial interventions to address the impact of caregiving, particularly as the patient approaches the end of life. To understand how best to support informal caregivers, we must first identify unmet needs by exploring their experiences of supporting people receiving conservative management.

Objectives:

This study aims to explore the experiences and unmet needs of informal caregivers of patients with kidney failure receiving conservative management.

Methods:

We recruited informal caregivers from five NHS sites in the UK, including two sites in London and three sites in Northern Ireland. We conducted semi-structured interviews with informal caregivers to explore their experiences of providing care for people with kidney failure receiving conservative management. We transcribed the interviews verbatim and carried out a thematic analysis.

Results:

Informal caregivers typically provide care to loved ones who have multiple complex issues, alongside kidney failure. They described significant and varied responsibilities, sometimes feeling restricted due to their caregiving role. Support from wider family and friends facilitated the ability of caregivers to maintain a social life and a sense of identity separate from the caregiving role. While many caregivers described difficulties in their interpersonal relationships and the reversal of certain family roles, such as parent and child, others expressed gratitude for the opportunity to 'give back' and the time they had with their loved ones at the end of life. Despite anxiety and discomfort around disease progression, caregivers acknowledged high-quality professional support from renal services but articulated a desire for more information about illness trajectory, including potential symptoms, particularly as their loved ones approached the end of life.

Conclusion:

Informal caregivers of people receiving conservative management experience varied challenges within their role, however, adequate professional and social support can have a profound influence on mental and social well-being. Several unmet support needs were identified, such as anxiety around the end of life and the need for consistent information about disease progression. Further research is necessary to ensure that the health and well-being of informal caregivers is adequately supported, particularly towards the end of life.

Cardiorespiratory fitness in kidney transplant recipients: A case-control study and the effects of a structured home-based exercise programme

Miss Roseanne E Billany[1], Miss Ella C Ford[2], Miss Gurneet K Sohansoha[2], Miss Zahra Mubaarak[1], Miss Stephanie Burns[3], Dr Noemi Vadaszy[2], Prof Nicolette C Bishop[4], Prof Alice C Smith[2], Prof Gerry P McCann[1], Dr Matthew PM Graham-Brown[1]

[1]Department of Cardiovascular Sciences, University of Leicester. [2]Department of Population Health Sciences, University of Leicester. [3]John Walls Renal Unit, University of Leicester. [4]School of Sport, Exercise and Health Sciences, Loughborough University

Miss Roseanne E Billany

Biography
A Clinical Trials Facilitator with a background in Exercise Physiology. Interested in exercise and cardiovascular disease in kidney transplant recipients.

Abstract

Introduction

Kidney transplant recipients (KTR) have an increased burden of cardiovascular disease (CVD) due to the clustering of traditional and non-traditional risk factors. Poor cardiorespiratory fitness (CRF) is associated with higher levels of morbidity and mortality; particularly cardiovascular-related. Although KTR have higher CRF than patients with kidney failure, exact comparisons with the general population have not been fully quantified. Therefore, the aims of this study were: (1) to compare CRF parameters in KTR and age-sex matched healthy volunteers (HV), (2) explore the CRF-related effects of a randomised controlled trial (RCT) involving a 12-week home-based exercise intervention in KTR.

Methods

Case-control: 30 KTR (14 male; age 61 ± 8 years; body mass 81.0 ± 19.5 kg) and 30 HV (14 male; age 61 ± 7 years; body mass 76.7 ± 17.8 kg) completed a continuous ramp cardiopulmonary exercise test (CPET) to volitional exhaustion on a cycle ergometer. Cardiorespiratory fitness categories were determined as described by the American Heart Association (1972)[1]. CPET variables were compared between groups using independent t-tests.

RCT[2]: 50 KTR were recruited and randomised into the 12-week, combined aerobic and resistance training, home-based exercise intervention (INT: n=25, 10 male, age 49±13 years, eGFR 60±20 ml/min/1.73m^2) or best-standard care control (CNT: n=25, 13 male, age 51±15 years, eGFR 61±21 ml/min/1.73m^2). To investigate the differences between groups at follow-up, analysis of covariance (ANCOVA) adjusted for baseline value was used.

Results

Case-control: Greater proportions of KTR exhibited low (20.0%) and fair (46.7%) fitness classifications rather than average (30.0%) and good (3.3%) in comparison to HV (low 6.7%, fair 16.7%, average 50.0%, good 26.7%). Both groups had zero participants in the 'high' category. KTR had reduced exercise capacity and increased ventilatory response to exercise compared to HV (Figure 1). Cardiorespiratory fitness adjusted for weight (relative $\dot{V}O_{2peak}$) was 5.29 ±1.35 ml/kg/min lower in KTR than in healthy volunteers.

RCT: After adjusting for baseline values, follow-up values were significantly greater in INT compared to CNT for $\dot{V}O_{2peak}$ ml/kg/min, $F(1, 36) = 5.0$, $p = .03$, max HR $F(1, 36) = 5.4$, $p = .03$, and max work rate $F(1, 36) = 4.8$, $p = .04$ but not $\dot{V}O_{2peak}$ L/min $F(1, 36) = 4.5$, $p = .13$. Post-intervention $\dot{V}O_{2peak}$ ml/kg/min, after baseline adjustment, was 1.50 ml/kg/min (95%CI: .1 to 2.9) greater in the INT versus CNT (Figure 2).

Discussion

Results suggest that CRF was significantly impaired in KTR when compared to age-sex matched HV and that a 12-week home-based exercise programme induced a significant improvement. A minimum clinically important difference of 1.5 ml/kg/min has previously been established in people living with chronic kidney disease. Taken together these results indicate the need to prioritise the development and implementation of structured exercise and educational programmes for KTR as part of routine care to support reducing the burden of CVD in these patients.
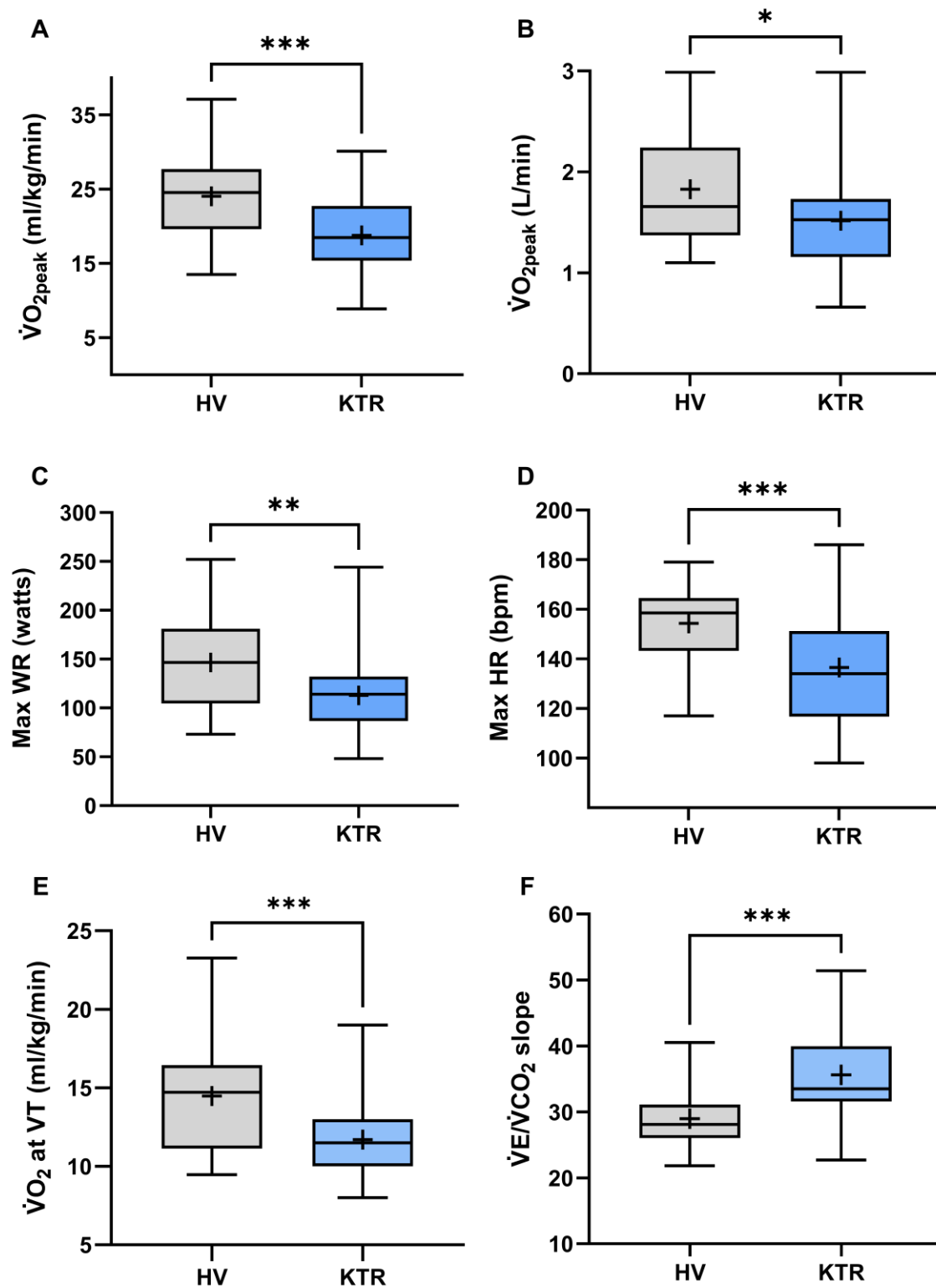
Figure 1. Distribution of values for basic peak cardiorespiratory fitness parameters in HVs and KTRs.
(A, $\dot{V}O_{2peak}$ [ml/kg/min]; B, $\dot{V}O_{2peak}$ [L/min]; C, maximum work rate [watts]; D, maximum heart rate [bpm]; E, $\dot{V}O_2$ at ventilatory threshold [ml/kg/min]; F, $\dot{V}E/\dot{V}CO_2$ slope).
Abbreviations: HR, heart rate; HV, healthy volunteers; KTR, kidney transplant recipients; $\dot{V}E$, volume of air inspired or expired per minute; VT, ventilatory threshold; WR, work rate.
*p ≤.05, ** p ≤.01, ***p ≤.001. "+" indicates mean value.
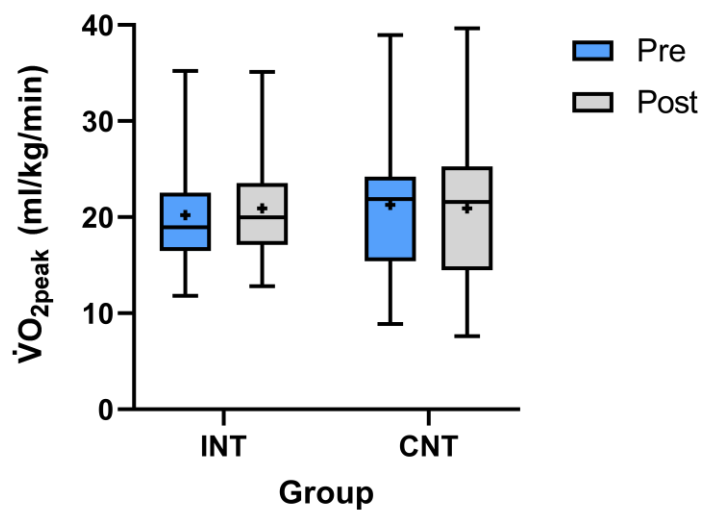
Figure 2. Distribution of values for pre and post intervention $\dot{V}O_{2peak}$ (ml/kg/min) in intervention and control groups.
Abbreviations: CNT, control group; INT, intervention group.
"+" indicates mean value.

References

[1]American Heart Association (1972) *Exercise testing and training of apparently healthy individuals: a handbook for physicians.* Dallas, Tex: The Association.

[2]Billany, R. E., Vadaszy, N., Bishop, N. C., Wilkinson, T. J., Adenwalla, S. F., Robinson, K. A., Croker, K., Brady, E. M., Wormleighton, J. V., Parke, K. S., Cooper, N. J., Webster, A. C., Barratt, J., McCann, G. P., Burton, J. O., Smith, A. C. & Graham-Brown, M. P. (2021a) A pilot randomised controlled trial of a structured, home-based exercise programme on cardiovascular structure and function in kidney transplant recipients: the ECSERT study design and methods. BMJ Open, 11(10), e046945. 10.1136/bmjopen-2020-046945.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

NCT04123951

The effects of a 12-week home-based exercise programme on cardiovascular structure and function in kidney transplant recipients: a pilot randomised controlled trial

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Miss Roseanne E Billany

Biography
A Clinical Trials Facilitator with a background in Exercise Physiology. Interested in exercise and cardiovascular disease in kidney transplant recipients.

Abstract

Introduction

Cardiovascular disease (CVD) remains a significant cause of morbidity and mortality in kidney transplant recipients (KTRs) due to clustering of traditional and non-traditional risk factors. Studies in CKD have shown positive effects of exercise on cardiovascular health. However, only small amounts of evidence exist in KTRs. This pilot study assessed the effects of a 12-week home-based exercise programme on cardiovascular structure and function in KTRs assessed by multiparametric cardiac magnetic resonance imaging (CMR).

Methods

Fifty KTRs were recruited and randomised 1:1 into the 12-week, combined aerobic and resistance training, home-based exercise intervention[1] (INT: n=25, 10 male, age 49±13 years, eGFR 60±20 ml/min/1.73m^2) or best-standard care control (CNT: n=25, 13 male, age 51±15 years, eGFR 61±21 ml/min/1.73m^2). Stress perfusion CMR was performed before and after the trial intervention period, including left ventricular (LV) structure and function, global longitudinal and circumferential strain, native T1 mapping (measure of fibrosis), myocardial perfusion reserve and aortic distensibility. To investigate the differences between groups at follow-up, analysis of co-variance (ANCOVA) adjusted for baseline value was used. Within group changes were assessed with paired samples t-tests.

Results

Twenty-two participants in the INT and 24 in the CNT completed the 12-week trial period. Paired samples t-tests showed significant increases in LV end diastolic volume (LVED; p = .04) and ascending aorta distensibility (p = .04) and significant reductions in myocardial global native T1 time (p =.01) in the INT group (Table 1). There was a significant increase in LVED in INT compared to CNT (adj. mean difference 15.5ml [95%CI: .94 to 30.1; p = .038]). There was a non-significant trend for myocardial global native T1 time and LV mass/LVED to decrease in the INT group compared to CNT (adj. mean difference -26.6ms [95%CI: -54.1 to 0.9; p = .058] and adj. mean difference -.01 [95%CI: -.2 to .01; p = .073], respectively). There were no significant differences between INT and CNT for LV mass or ejection fraction, strain, myocardial perfusion reserve, or aortic pulse wave velocity (Table 1).

Table 1. Mean baseline and follow-up CMR parameters and adjusted mean difference between intervention and control groups.

MRI Measure		Intervention		Control		Adjusted Mean Between Group Diff at Follow-up (95% CI); P-value
		Baseline	Follow-up	Baseline	Follow-up	
Left Ventricle	End diastolic volume (LVED; ml)	140 ±42.8	153 ±41.1*	147 ±31.6	144 ±31.3	15.5 (1.0, 30.1; **0.038**)**
	Ejection fraction (%)	64.3 ±10.3	64.2 ±6.6	63.7 ±8.2	62.7 ±7.9	1.5 (-2.33, 5.34; 0.433)
	Mass index (g/m^2)	66.5 ±16.8	62.1 ±9.7	71.3 ±17.9	64.1 ±14.7*	0.36 (-5.85, 6.56; 0.908)
	Mass / LVED (g/ml)	0.95 ±0.38	0.80 ±0.17	0.89 ±0.15	0.89 ±0.19	-0.10 (-0.21, 0.01; **0.073**)
Right Measures	Ejection fraction (%)	55.8 ±9.9	53.5 ±5.94	55.6 ±7.6	55.7 ±9.9	-1.86 (-6.48, 2.77; 0.422)
Strain	Global circumferential strain (%)	-19.2 ±3.0	-19.2 ±3.5	-18.5 ±3.2	-17.8 ±3.5	-0.959 (-2.32, 0.40; 0.163)
	Global longitudinal strain (%)	-16.1 ±3.5	-16.7 ±3.9	-15.9 ±5.9	-15.7 ±3.6	-1.02 (-2.72, 0.69; 0.236)
	Peak late diastolic circumferential strain (s^{-1})	0.68 ±0.26	0.60 ±0.15	0.68 ±0.22	0.66 ±0.22	-0.074 (-0.171, 0.023; 0.131)
	Peak late diastolic longitudinal strain (s^{-1})	0.70 ±0.22	0.78 ±0.30	0.79 ±0.19	0.76 ±0.24	0.075 (-0.0712, 0.221; 0.307)
Diffuse Fibrosis	Myocardial global native T1 time (ms)	1280 ±35.9	1250 ±48.9*	1260 ±57.3	1270 ±66.5	-26.6 (-54.1, 0.9; **0.058**)
	Myocardial extracellular volume (%)	0.27 ±0.14	0.27 ±0.04	0.26 ±0.04	0.27 ±0.03	0.009 (-0.022, 0.040; 0.553)
Perfusion Measures	Myocardial perfusion reserve (ml/min/g)	2.2 ±0.6	2.8 ±0.76	3.2 ±0.7	3.2 ±1.2	-0.223 (-1.32, 0.87; 0.662)
Aorta Distensibility	Ascending aorta distensibility (mmHg^{-1}×10^{-3})	3.2 ±2.2	4.2 ±2.8*	3.6 ±2.6	3.3 ±2.8	0.591 (-0.79, 1.97; 0.388)

Abbreviations: CMR, cardiac magnetic resonance imaging;

*significant within group change on paired t-test: **significant between group difference on ANCOVA

Discussion

This pilot study demonstrates promising results suggesting that a home-based exercise programme may be beneficial for KTR. The data can be applied to power future clinical studies to assess the effects of (home-based) exercise training programmes on CMR measures of CVD in KTRs. Future powered trials should also seek to explore the effects of longer intervention periods with differing volumes of exercise to assess for differential effects in cardiovascular response.

References

[1]Billany, R. E., Vadaszy, N., Bishop, N. C., Wilkinson, T. J., Adenwalla, S. F., Robinson, K. A., Croker, K., Brady, E. M., Wormleighton, J. V., Parke, K. S., Cooper, N. J., Webster, A. C., Barratt, J., McCann, G. P., Burton, J. O., Smith, A. C. & Graham-Brown, M. P. (2021a) A pilot randomised controlled trial of a structured, home-based exercise programme on cardiovascular structure and function in kidney transplant recipients: the ECSERT study design and methods. BMJ Open, 11(10), e046945. 10.1136/bmjopen-2020-046945.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO): NCT04123951

Poster number: 209

Submission number: 153

The relationship between cardiovascular health and physical activity in individuals receiving haemodialysis

<u>Dr Daniel S March</u>[1,2], Dr Katherine L Hull[1,2], Ms Lucy Abell[3], Ms Stephanie Burns[2], Mr Darren R Churchward[1,2], Dr Matthew PM Graham-Brown[1,2], Professor Laura J Gray[3], Dr Patrick J Highton[4], Ms Rahma Said[3], Dr Hannah ML Young[4], Professor James O Burton[1,2]

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Dr Daniel S March

Biography
Daniel re-joined the University of Leicester in May 2022 as a Lecturer. Daniel's research mostly involves investigating the effect of lifestyle factors in individuals with chronic kidney disease, he also has teaching responsibilities and leads a module titled Cardiovascular and Renal Precision Medicine. Prior to this he worked at the York Trials Unit at the University of York as a Research Associate. From 2015-2021 Daniel worked as a Research Associate at the University of Leicester, this primarily involved coordinating a research team to deliver the CYCLE-HD (improving cardiovascular health in dialysis patients using a structured programme of exercise) trial in the end-stage kidney disease population. This work enabled him to publish data around the efficacy and cost-effectiveness of exercise during dialysis. Daniel (with others) obtained funding to set up and run other trials aimed at lowering cardiovascular risk in individuals with chronic kidney disease.

Abstract

Introduction

Individuals receiving kidney replacement therapy have a significantly increased risk of cardiovascular disease, which is the leading cause of death and is believed to be driven by non-traditional risk factors. In addition, these individuals are physically inactive, which associates with high levels of cardiovascular and all-cause mortality in this population. However, the precise relationship between levels of physical activity and cardiovascular health has not previously been explored. This study investigated relationships between physical activity and cardiovascular health in the haemodialysis population.

Methods

This was a post-hoc analysis of 108 participants receiving haemodialysis who were part of the CYCLE-HD trial. Cardiovascular health was measured using cardiac magnetic resonance imaging (CMR); left ventricular ejection fraction (LVEF), left ventricular mass, left ventricular mass/left ventricular end

diastolic volume, global native T1 and pulse wave velocity were measured. Physical activity parameters (steps per day and metabolic equivalent of task (METS)) were measured using an (arm worn) accelerometer (7 days). Unadjusted and adjusted (for age, body mass index, hypertension, haemoglobin levels, dialysis vintage and ultrafiltration volume) multiple linear regressions between CMR and physical activity parameters were performed. Relationships were further explored using natural cubic spline models with four degree of freedom (five knots).

Results

There was a significant relationship between cardiac function (LVEF; P=0.01; β=0.247 [0.000, 0.002]) and steps per day, and cardiac fibrosis (global native T1; P=0.006; β=-0.272 [-0.007, -0.001]) and steps per day, which both remained on adjustment (P=0.027; β=0.257 [0.000, 0.002] for LVEF, and P=0.042; β=-0.235 [-0.007, 0.000] for global native T1). There was a relationship between rate of energy expenditure during physical activity (METS) and arterial stiffness (pulse wave velocity; P=0.004; β=-0.288 [-8.563, -1.653]), however this did not remain on adjustment. Further modelling of the relationship between steps per day and LVEF using natural cubic spline models showed a non-linear relationship with most of the improvement in cardiac function (LVEF) observed between 0 to 2,000 steps per day in our sample (Figure 1A). Natural cubic spline modelling showed a non-linear inverse dose-response association between steps per day and cardiac fibrosis (global native T1), with the most pronounced reduction in fibrosis (in our sample) being between ~2,500 and 6,000 steps per day (Figure 1B).

Discussion

Based on the associations observed in these data, individuals receiving haemodialysis should aim for at least 2,500 steps per day, although cardiovascular benefits were found with lower levels of activity. This target is more achievable to the dialysis population whom face a number of barriers to activity. The data supports the guideline recommendations that "some physical activity is better than none", and provides less emphasis on threshold-based recommendations. This study is an exploratory post-hoc analysis, further work is needed to explore to these findings in longitudinal and interventional studies, and to determine the impact on important clinical outcomes such as mortality.
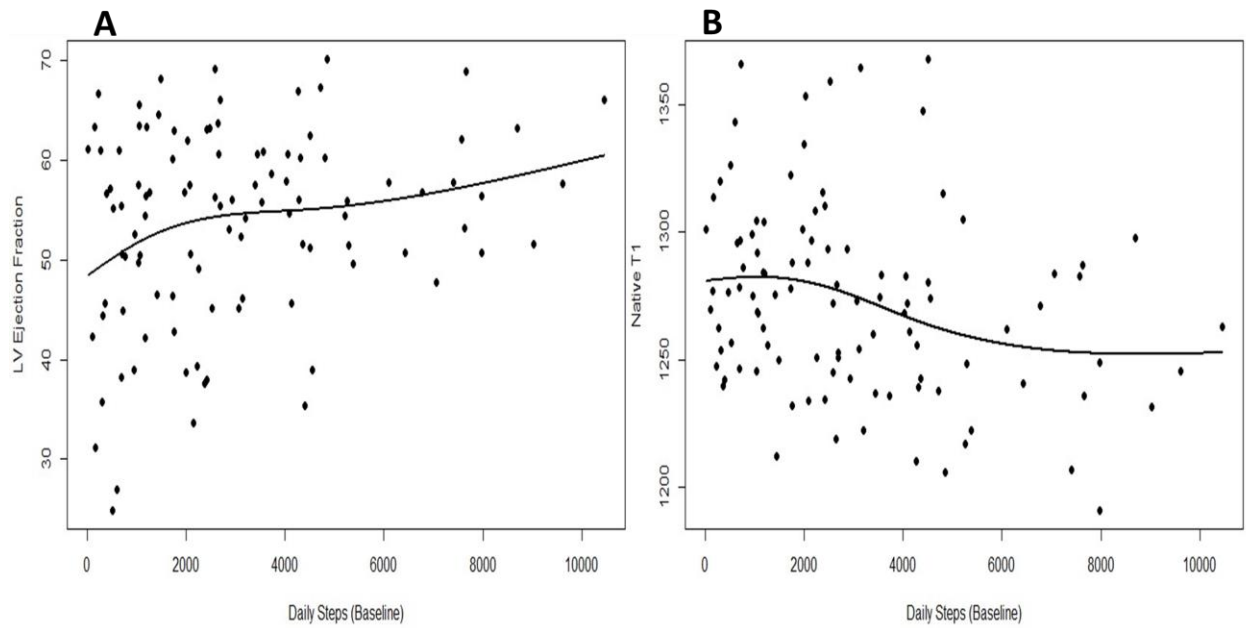
Figure 1A. Natural cubic splines model with 5 knots (3 internal and 2 boundary knots) showing the relationship between steps per day and LVEF. **Figure 1B**. Natural cubic spline model with 5 knots showing the relationship between steps per day and global native T1.

Poster number: 210

Submission number: 158

Initial data from the Kidney Beam Haemodialysis sub-study

Dr Rebecca Ryan[1,2,3,4], Dr Fiona Trew[1], Dr Mei Yen Chan[1], Ms Laura Blanch[1], Dr Deepika Manhoran[2], Dr Nicholas Gangoo[2], Dr Sharlene Greenwood[5]

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Dr Rebecca Ryan

Biography
MBBS Newcastle University, completed post-graduate training within the Northern deanery, working as an ST7 in Nephrology at Sunderland Royal hospital with a primary clinical interest in GN/Vasculitis and an enthusiasm for exercise, health and wellbeing which is reflected in the kidney beam sub-study design and implementation for in centre haemodialysis patients.

Abstract

This regional trial is a sub-study within the larger Kidney BEAM trial, which evaluated the efficacy of a digital health and wellbeing platform (Kidney BEAM) on improving physical and quality of life parameters for patients with CKD.

The kidney beam site has remained free to access for all CKD patients locally after it was funded by the NE Renal Network, having previously been supported by charitable funds. The platform comprises both exercise videos and health and wellbeing advice videos for patients. We hypothesised that the in centre haemodialysis population would have much to gain from the platform, as this patient population are typically frail with high morbidity rates and may face barriers to exercise as a consequence of their mobility and the time limitations imposed by their regular haemodialysis slots. The kidney beam team therefore designed a bespoke 12-week exercise program comprising exercise video's which patients could watch, and complete, whilst connected to haemodialysis.

In designing the study, we also took note of recently published health and technology inequality data and hypothesised that equipment and IT accessibility may pose a barrier to patient engagement with the program within the dialysis population. We therefore designed the trial with three separate arms, each with 20 patients, with each arm separated across three North East units: Arm 1) Access to Kidney beam alone, Arm 2) Kidney beam plus free to use exercise and IT equipment, Arm 3) Kidney beam, exercise and IT equipment plus once weekly physiotherapy or clinician input, in the form of additional exercise regimes and encouragement/support respectively.

We measured patients grip strength, their sit-to-stand 60 score and their ED-5Q-L score (physical health related QoL questionnaire) at the beginning and then again at the end of the 12 week program.

At the time of abstract submission, the study is still underway and the post-program data collection is not yet complete (the trial will be finished across the 3 sites at the beginning of April) and so provisional data cannot be outlined here. The Kidney Beam trail, of which this is a sub-study, was recently published in the Lancet, this evaluated outcomes for CKD patients (not only haemodialysis) using kidney beam Vs control across 11 sites in the UK and showed an improvement in QoL scores within the kidney beam arm. The anticipation is that we will see an improvement in the measured parameters within this smaller haemodialysis population, but that within this frailer cohort of patients, we hypothesise that the arm-3 group receiving the 1-1 physio/clinician input will gain the most benefit and that within the arm-1 group, without the provision of equipment, uptake to the program will be comparatively poor (this has been shown in the initial recruitment of patients to each arm so far). This could raise a debate about the best use of funding for exercise and wellbeing measures and the efficacy of digital health interventions alone in this population.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

IRAS 291403

How do older people with advanced kidney disease and their family members approach kidney treatment decision-making? A qualitative study.

Dr Robert Kimmitt[1], Professor Joanna Coast[2], Dr Lucy E Selman[2], Dr Leila Rooshenas[2], Dr Charlotte Snead[2,3], Professor Rachael Morton[4], Professor Fergus Caskey[2,3], Dr Barnaby Hole[2,3]

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Dr Robert Kimmitt

Biography
Robert is an academic clinical fellow and renal registrar, working with the Exeter Kidney Unit and the Universities of Exeter and Bristol. His interests within renal medicine include supportive kidney care, the advanced kidney care clinic and the decision-making process for older and frailer patients considering future kidney therapy (such as conservative care and dialysis). He is a member of the UKKA Supportive Care SIG Research and Data subgroup.

Abstract

Introduction:

Chronic kidney disease (CKD) is common in the UK, especially amongst frail older people with multiple health problems. The survival benefit of kidney replacement therapy (KRT) for such patients is uncertain and the burdens significant, meaning patients make difficult decisions between planning for dialysis or opting for conservative kidney management (CKM).

People close to individuals with advanced CKD are known to play an important role in treatment decision-making, but data exploring their perspectives are limited. This qualitative study aimed to explore older, comorbid patients' and family members' understanding of and views regarding treatment decision-making.

Methods:

In-depth interviews were conducted in person in 2018-2019 among older patients with advanced CKD (>80 years old or >65 with evidence of frailty or comorbidity) and least one family member (partner/spouse/child/grandchild) per patient. Interviews used open-ended questioning, supported by a topic guide based on patient input and the literature. Transcripts were analysed using inductive thematic analysis and constant comparison to identify concepts and meanings from participants' views

and reported experiences. Codes and interviews were discussed and compared among study investigators, with consideration of wider meaning, alongside reorganisation and recoding, and thematic development.

Results:

Ten patients and 12 family members (6 spouses/partners, 5 adult children and 1 adult grandchild) were interviewed. Four themes were identified: (1) *"whose decision is it anyway?"*; (2) *"facing uncertainty"*; (3) *"on death and dying"* and (4) *"caring and being cared for"*.

"Whose decision is it anyway?" speaks to perceived nuances around the ownership of decisions about kidney therapy. While some interviewees described the decision belonging solely to the patient, others described varying degrees of collaboration with and persuasion from family members (particularly partners/spouses). Clinician influence was also described by patients and family members.

"*Facing uncertainty"* captures patients' and their family members' view that decisions are contingent upon largely uncertain future circumstances.

"On death and dying" describes the pivotal role in treatment decision-making of patients' and family members' sense of life completion and feelings about death and dying. KRT was perceived as life-prolonging, while an acceptance of death and dying was seen to be important for consideration of CKM.

"Caring and being cared for" elucidates the importance of caring roles between patients and their family members for decisions about the future, including the specific effect of loving relationships on the value patients and their family members assign to living.

Discussion:

We found both patients and family members influence treatment decisions, which they tend to view as flexible in the face of uncertainty. The desire to prolong important family relationships was a motivator for favouring KRT, in light of an understanding of KRT as life-prolonging.

Kidney services should recognise the significance of family relationships to older patients' treatment decision-making. Clinicians must ensure that patients and family members understand the implications of treatment choice for quality-of-life, prognosis, and end-of-life care. This is likely to include understanding which family members or close ones are important, involving these people in decision-making and recognising that changes in family situations may necessitate re-visiting previous decisions.

Figures:

Table 1: Illustrative data extracts supporting themes (data pseudonymised)

Whose decision is it anyway?
"They didn't really get any choice in the matter because the choice was mine" – Betty (85-year-old woman planning for conservative kidney management)
"I must have been about a month persuading him to go for dialysis and in end he says 'yeah I'm not being fair to you, I'll do it'" – Wife of Jeremy (81-year-old man planning for haemodialysis)
Facing uncertainty
"I have still got the choice. I can say, 'No, I don't want it' [haemodialysis]" – Derrick (89-year-old man planning for haemodialysis)
"He [the nephrologist] says 'I'd be quite surprised if you ever get there'. He says, 'But we'll show you what everything's about, then you know what's, if it ever gets there, you know, while she's fit and well, sort of go round and see it all.'" – Son of Beryl (81-year-old woman planning for conservative kidney management)
On death and dying
"If you die from kidney failure you just go to sleep 'cos the kidneys give up and you go to sleep and you're dead which is quite pleasant 'cos you ain't going to end up in hospital for months" – Clive (82-year-old man planning for conservative kidney management)
"It's the inevitable that again you know it's going to happen sometime, but how many times do you think about it? You don't do you? You try not to, or I don't anyway" – David (65-year-old man planning for haemodialysis)
Caring and being cared for
"To me, he's never been a burden. To me he is not only my husband, but he is my friend and we have known each other quite a long time now and even though he can't do the things that he used to do, I still like having him around." – Wife of Derrick (89-year-old man planning for haemodialysis)
"I want to spend as much time as I can with my wife and my family obviously, I don't want to be dying like tomorrow or whatever." – Jeremy (81-year-old man planning for haemodialysis)

Poster number: 212

Submission number: 309

London Kidney Network supportive care data audit : Exploring the possibilities ; Understanding the challenges.

<u>Dr Heather Brown</u>[1], Lisa Ancliff[2], Rouven Calayag[3], Dr Katie Chu[4], Kieron Clark[1], Dr Colley Crawford[2], Nicola Cunningham[5], Dr Stuart Deoraj[6], Dr Nirali Desai[1], Darren Duffield[7], Lalaine Espiritu[7], Dr David Evans[6], Jaryn Go[8], Dr Sian-Marie Kelly[4], Kaval Makwana[6], Dr Lina Nikolopoulou[7], Dr David Randall[8], Tatjana Rudolphy[3], Dr Selva Saminathan[1], Dr Tina Thompson[7], Dr William White[8], David Wright[2], Katie Vinen[4]

[1]Guys and St Thomas NHS Foundation Trust, London. [2]Royal Free Hospital, London. [3]St Georges Hospital, London. [4]Kings College Hospital, London. [5]London Kidney Network, London. [6]St Heliers Hospital, London. [7]Imperial College Healthcare NHS Trust, London. [8]Barts Health NHS Trust, London

Dr Heather Brown

Biography
Heather is a Consultant Nephrologist working at Guys Hospital in London, and co-chair of the LKN supportive care work stream.

Abstract

<u>Introduction:</u>

The average age of patients starting dialysis in the UK is 63, many of whom are already living with significant frailty. There is currently no standard for assessing frailty to support decision making in advanced kidney care clinics (AKCC) or to improve care during either conservative management or renal replacement therapy (RRT).

In 2023, the LKN comprising 7 renal units, performed a baseline audit of key data pertaining to patients following a conservative care pathway (CC) and those receiving RRT for whom functional optimisation and quality of life had become predominant goals of care (together called supportive care).

<u>Methods:</u>

For the 7 London renal units data was captured on 1st June 2023 or cumulative data from 1st June 2022 - 31st May 2023 to include:

- Clinical frailty score (CFS)
    1. AKCC population >= to 60 years with GFR < 15
    2. Patients > or = 60 receiving RRT
- Cause and place of death

- Patients identified in need of advanced care planning (ACP) >= 60, GFR < 15 in AKCC planned for CC and in those receiving RRT.

Results

All units submitted data but there was wide variation in items available and extractable (Table 1).

The network cares for 2091 patients in AKCC with GFR < 15 who are >= 60 years, 530 of which were planned for CC (25.3%). The proportion of patients for CC compared to the total number of patients GFR <15 varied from 8% to 45%.

Demographics of different centres populations showed units were serving very different populations (age and ethnicity).

Main causes of death reported were infection, cardiovascular disease, and withdrawal/end-stage kidney disease. Data had poor completion rates (up to 59% of causes of death were not recorded) as is consistent with the national picture.

CFS and ACP data was recorded variably between modalities. HD recorded the most complete data (Table 1 and Figure 2) whilst transplant patients were least often scored even in units with higher percentages of older transplant patients.

London units described a frail population and ACP was accepted as necessary care. Despite this, patients were variably identified, with ACPs being achieved in between 17% and 95% of patients identified as in need.

Discussion:

To our knowledge this is the first time a network has attempted to collect extensive supportive care data apart from that issued by the Scottish Renal Registry.

The populations were very heterogeneous (Unit 4 was elderly and of pre-dominantly white ethnicity where Unit 6 had a younger population of mixed ethnicity with significant numbers of Asian British patients).

Not all centres were collecting CFS data systematically in AKCC prior to decision making, suggesting a possible missed opportunity to provide the most suitable personalised care pathway.

Data collection may have been hampered by a lack of nationally mandated data, lack of automated collection, poor understanding and access to data for patients outside their main hospital and varying IT systems.

This abstract highlights the challenges of collecting data in a new clinical area especially where data is neither mandated nor automated.

	Total	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
% patients for supportive care GFR <15 (as percentage of patients in AKCC GFR <15) Snap short 1st June 2023	25.3%	40%	26%	17%	8%	29%	23%	45%
% patients assessed for CFS in AKCC >=60 years GFR <15		75%	32%	73%	Incomplete	Incomplete	0	9%
% patients assessed for CFS in HD >=60		94%	86.1%	89%	36%	98.7%	4%	21.5%
% patients assessed for CFS in PD >=60		100%	10%	48%	7%	100%	5%	18.9%
% patients assessed for CFS in Transplantation >=60		23%	4%	8%	2%	46.5%	<1%	15%
% RRT patients >= 60 with • reported cause of death • Reported place of death		• 59% • No data	• 41% • 66%	• Incomplete • Incomplete	• No data • No data	• 45% • 73.4%	• >50% • No data	• 75.5% • No data
% HD patients >=60 dying from dialysis withdrawal (% of total reported HD deaths)		9%	12%	26%	No data	No data	16.9%* (/total ESRF deaths)	11%
% HD patients deemed in need of ACP		42%	Incomplete	15%	Incomplete	Incomplete	Incomplete	No data
% HD patients started ACP of those in need		17%	Incomplete	93%	Incomplete	Incomplete	Incomplete	No data
The data base used to extract data for this audit		Renalware	EPR	CV5	CV5	Vitaldata	Renalware	Proton

Table 1: Supportive care audit data collection by renal unit
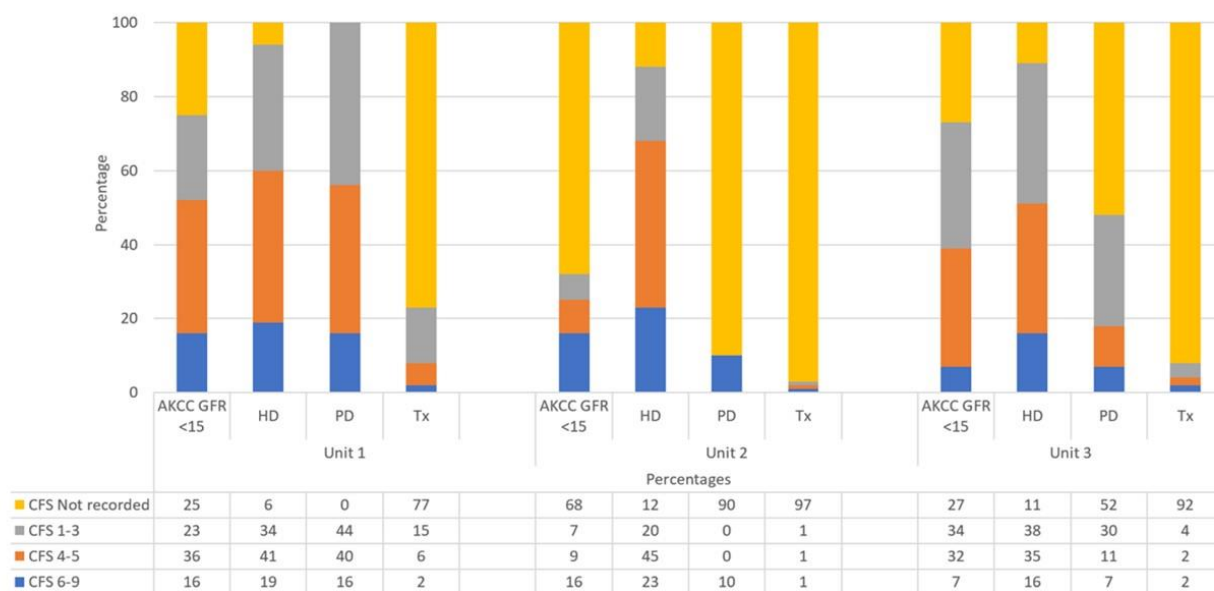
Figure 2: Distribution of clinical frailty scores by modality in patients >=60 years

Poster number: 213

Submission number: 362

The practical aspects of advance care planning within a supportive care model for patients on haemodialysis: a qualitative study

Dr Sherna F Adenwalla[1,2], Dr Courtney J Lightfoot[3], Professor Alice C Smith[3], Dr Matthew PM Graham-Brown[1,2]

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Dr Sherna F Adenwalla

Biography
Dr Sherna Adenwalla is an NIHR Academic Clinical Fellow in Renal Medicine at the University of Leicester, and is currently completing Internal Medical Training. During medical school, she undertook an intercalated BSc with the CYCLE-HD team in Leicester (a randomised controlled trial investigating the effect of intra-dialytic cycling on left ventricular mass). After graduating from Leicester, she continued to work within the kidney research team by pursuing work linked to her BSc, around cardiovascular health and physical function in patients with ESKD, but she has also developed an interest in advance care planning (ACP) in patients on dialysis and the challenges around implementation of ACP.

Abstract

Introduction:

Patients on dialysis experience high symptom burden and variable health trajectories. Advance care planning (ACP) is a shared decision-making process that helps patients discuss their values for care and prepare for declining health. These discussions often occur late in the disease process when the focus is on end-of-life. A model of 'supportive care', where ACP and palliative principles are introduced earlier in the disease trajectory, could empower patients to make informed decisions about their current and future care, and communicate their wishes better whilst engaging in 'restorative' treatments. We explored the experiences of ACP for patients on dialysis, and perceptions of a supportive care model.

Methods:

Semi-structured interviews with adults on maintenance haemodialysis and their next-of-kin (if the participant wished) were conducted face-to-face at a location decided by the participant. Purposive sampling was used to capture a range of perspectives based on disease trajectory and ethnicity. Interviews were audio-recorded, transcribed, and analysed using framework analysis. A sample of interviews were coded by two researchers to agree on framework and codes.

Results:

14 interviews were conducted including 13 patients (median age 63 (IQR:56-67) years) and nine next-of-kin (nine males, nine participants from White British backgrounds and 13 participants from South Asian backgrounds). The median interview length was 48 (IQR:45-62) minutes. Themes and subthemes are summarised in Figure 1. Participants lacked awareness about how prognosis is estimated, the severity of their own condition, and the impact ESKD may have on their health and function whilst alive. The future was perceived to be too unpredictable to make decisions despite acknowledging death being inevitable. Few participants were aware of the concept of ACP with a healthcare professional. Some patients had advance directives for death, but few had discussed deterioration scenarios. Participants perceived the concept of earlier, integrated ACP positively as a way of maximising quality of life alongside future considerations, despite concerns about distress. Participants wanted 'pre-discussion' information as a booklet or video before a face-to-face ACP discussion with a healthcare professional they trusted and who understood their health. Many participants expressed that they would like ACP discussions to better prepare them for the future by educating them about illness scenarios and options for support, whilst allowing them to enjoy the present.

Discussion:

Participants lacked awareness of ACP as a concept and considered it to be a one-off interaction focussing on completion of documentation associated with end-of-life scenarios. Individuals on dialysis can live for many years, with the associated burdens, which can make future scenarios and decision-making difficult to conceptualise. An ACP process under a supportive care model that encourages patients and healthcare professionals to consider present and future values/goals may be more applicable and promote better engagement.

1.	**How patients are making decisions for the future**
	• Previous ESKD experiences inform decision-making
	• Health awareness
	• Social, cultural and religious influences
2.	**Perception of ACP**
	• Variable knowledge of current ACP processes
	• Emotive but important topic
	• Needs to be sensitive and personalised
	• Personalisation extends to stage of disease and focus of care plan
3.	**Preferences for ACP discussion**
	• Discussions should be ahead of time but decision-making does not have to be
	• Conversations should be introduced by clinical team, but most important is consistency and trust
	• Some patients wanted to have discussions as part of routine clinic appointments
4.	**Considerations for delivering an ACP programme**
	• Systems challenges means care doesn't seem as holistic and capacity in the system to get help is diminished
	• Language barriers
	• Need for many platforms to provide information and education (online vs paper-based/face to face vs virtual)
5.	**Goals, values and preferences for patients and families**
	• 'Preparedness'- awareness of possible illness scenarios and recovery
	• Acknowledging uncertainties
	• Value agency in their lives
	• Carer wellbeing

Figure 1: Themes and subthemes from semi-structured interviews with patients on dialysis and next-of-kin

ACP; advance care planning, ESKD; end-stage kidney disease

Poster number: 214

Submission number: 422

Collaborative working through a renal network to lead improvements in Supportive Care services in London.

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Nicola Cunningham

Biography
Nicola is the Senior Programme Manager for the London Kidney Network. She spent 10 years working as a physio in neuro-rehabilitation and oncology and palliative care, before working as a project manger and AHP lead in two London cancer networks. Following five years working as a service manager for a national cancer charity, she joined the LKN in 2021. She is the project manager for several LKN workstreams including Supportive Care.

Abstract

Introduction:

Created in 2021, the London Kidney Network delivers improvements in care highlighted by GIRFT and the RSTP. With an aging renal population, optimisation of patients following an active non-dialysis pathway and those on renal replacement therapy for whom functionality and quality of life have become priorities (together called supportive care (SC) was felt key. A SC workstream was created led by 0.2WTE Clinical leadership and project management. Aims were to address unwarranted variation in SC by creating locally agreed pathways, community care networks and a toolkit of educational resources for patients and staff. It also aimed to define and monitor pilot outcome measures for an area of care without current nationally mandated data collection or agreed audit standards.

Methods:

7 London renal providers formed a medical and multi-disciplinary core steering group driving strategy with a wider group acting as advisors for specific work.   Representation from geriatric, palliative and primary care as well as expert patients and carers was included. Early meetings encouraged sharing and discussion of ideas, creation of a common vision and forging of new strong relationships.

Initial priorities were to: agree a definition for SC, develop a SC pathway for use across London and develop training and education materials on SC and advanced care planning (ACP) for a) renal specialist health professionals b) GPs for use in primary care and c) patients offered SC as a treatment option. The group developed strategies to raise the profile of SC within units, agreed data items forming a core set of metrics to measure activity against the pathway; and audited current practice using the metrics.

Smaller working groups tackled each item, with direction provided through six-weekly steering groups providing oversight, challenge, problem solving and peer review of progress. This enabled rapid progress using wide specialist knowledge and expertise.

Throughout the work, the Chairs visited each Unit performing 'deep dive' reviews of successes and challenges faced across London. This helped focus priorities and enabled sharing of innovation.

Results:

1. The London SC Pathway launched in February 2023 (fig 1).
2. A GP training module was developed and a webinar delivered in September 2023.
3. A SC e-module launched in October 2023. *
4. Pan-London metrics were agreed, and data collected across all London units. An audit was presented in December 2023 **
5. Two patient information booklets, "Making Your Treatment Decision" and "Living Well without Dialysis" were created (due February 24) (fig 2).
6. Increased visibility for SC has led to new London ICS funding directed towards this area of care.

Figure 1: LKN Supportive Care Pathway
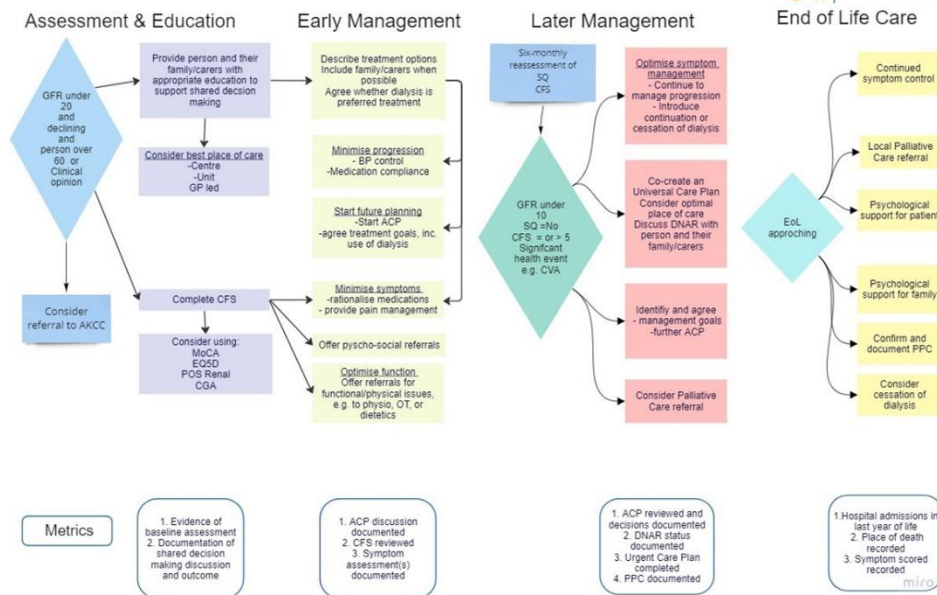
Figure 2 Patient Information booklet page examples

Discussion

A collaborative pan-London approach has enabled advancement in standardising and optimising SC. Units have shared achievements and sought peer support to address gaps in services. Future work will further refine metrics and data definitions, better align clinical practice e.g. use and documentation of Clinical Frailty Scale, and create symptom guidance for GPs. Workforce variation, models of working with care of elderly colleagues and further work on ACP and patient reported outcomes will follow.

Physical activity, exercise and sedentary behaviour interventions for people living with both frailty and multiple long-term conditions: a scoping review

Dr Hannah Young[1,2,3], Dr Joseph Henson[1,3], Dr Paddy Dempsey[4,5,6], Dr Scott Willis[7,3], Ms Roseanne Billany[3,8], Dr Ffion Curtis[9], Professor Laura Gray[10,3], Dr Sharlene Greenwood[11,12], Dr Louisa Herring[1,3], Dr Patrick Highton[13], Ms Krishna Patel[14], Dr Jack Sargeant[1,3], Dr Harini Sathanapally[13], Ms Martha Thomas[1,3], Dr Noemi Vadaszy[10,3], Dr Emma Watson[8,3], Professor Tom Yates[1,3], Professor Melanie Davies[1,3]

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Dr Hannah Young

Biography
Hannah Young qualified as a Physiotherapist in 2005 and joined the Leicester Kidney Lifestyle Team in 2011 to develop and implement a programme of exercise delivered during haemodialysis. In 2013, Hannah was awarded an MSc in Physiotherapy with distinction from the University of Nottingham. In her role as a Specialist Physiotherapist at the University Hospitals of Leicester NHS Trust, she has led projects designed to develop, test and implement novel rehabilitation strategies for people living with advanced kidney disease. Most recently she has evaluated a therapy service within the existing advanced kidney care clinic to proactively supports people to maintain or improve their physical and mental wellbeing. In 2021 she completed an NIHR Doctoral Research Fellowship, hosted by the University of Leicester. This work focused upon understanding frailty, falls and the role of exercise in haemodialysis patients. The same year she moved to Leicester Diabetes Centre. Her research interests include frailty, multi-morbidity, physical activity, physiotherapy, and rehabilitation. She has a particular passion for mixed methods research, clinical trials. In 2023 she was awarded an advanced NIHR fellowship to develop and test a tailored 24-hour health behaviour programme for people living with frailty and multiple long-term conditions, and their carers.

Abstract

<u>Introduction</u>

The number of people living with multiple long-term conditions (MLTC) is rising. The presence of MLTCs is particularly high in people with CKD. Within this population, those also living with frailty are particularly vulnerable to poor outcomes. Increased physical activity, including exercise, has the potential to improve multiple health and wellbeing outcomes in those living with both MLTCs and frailty, but may be challenging for this population. Reducing sedentary behaviour may also be important. This scoping review mapped the available evidence regarding these interventions in people living with both frailty and MLTCs.

Methods

MLTCs were defined as the presence of two or more long-term conditions from a pre-specified list. Studies meeting this criterion were included if at least one frailty measure or validated functional proxy was identified, alongside a physical activity or sedentary behaviour intervention. All study designs were included. Outcome measures were grouped according to the WHO International Classification of Functioning and Disability. Ten databases, trial registries and grey literature were searched for articles published from 2000 onwards.

Results

After screening of the 18494 studies identified, 154 papers from 143 studies, and 1 ongoing study were retained. The majority were randomised controlled trials (n=86, 55%). 132 (92%) studies were conducted in high income countries. Participants mean age was 73 ± 12 years, and 73% were of White ethnicity. Whilst people with CKD were well represented in the included studies, physical health conditions were predominantly researched, with little focus on mental health conditions. Most participants were pre- to moderately frail.

Interventions predominantly focused on structured exercise (n=83 studies, 59%) or a movement behaviour combined with additional interventions (n=54 studies, 39%). Multicomponent exercise interventions were predominantly examined (n=97 studies, 67%). Resistance training was most often included, but the importance of this component was not borne out in included qualitative studies. Individual tailoring of the intervention was evident in 57 studies (41%), and highlighted as important in the qualitative studies, particularly in relation to varying symptomology. Intervention adherence was 81% (IQR 62-89%) with goal setting, personalised messaging, monitoring, and peer/professional support being important mechanisms for increasing adherence. Carer support was also highlighted as critical to increasing engagement and adherence, yet carers were only involved in any capacity in n=15 (11%) studies. Most interventions reported positive outcomes, predominantly focusing on domains relating to body functions and structures, with less focus on activity and participation.

Conclusions

A modest volume of evidence exists on multicomponent structured exercise interventions, with less focus on those influencing habitual physical activity and sedentary behaviour. Movement interventions appear to report largely positive effects, but an updated systematic review is required to be assured of

this. Other notable evidence gaps include understanding how interventions should be tailored to the needs of this group, particularly concerning symptoms and the optimal involvement of informal carers. Research targeting outcomes of particular importance to this group, in more diverse populations and settings should be prioritised. The results will inform specific interventions for people living with CKD, MLTCs and frailty.

Poster number: 216

Submission number: 547

Adaptation of a paediatric palliative formulary for children with end stage kidney disease

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Scott Clark

Biography
Scott Clark is a trainee pharmacist based at the Queen Elizabeth University Hospital Glasgow. His interests include nephrology and medicine optimisation.

Abstract

Introduction

Though most children and young people with end stage kidney disease (ESKD) will be successfully transplanted, in a small number transplant may be inappropriate, unachievable or clinical deterioration occurs such that end of life care is inevitable. The management of end of life symptoms in children and young people with end stage kidney disease has little evidence base, partly due to the rarity of this eventuality. The Association for Paediatric Palliative Medicine (APPM) produces a guideline for symptomatic management at end of life in children and young people, including a pharmaceutical formulary for supportive care teams. This is the most current and widely used guideline in the UK for paediatric palliative care symptom management. We aimed to produce an addendum to the formulary, specifically reviewing the safety profile and influence of reduced kidney function for each medication included. The overall aim was development of a practical resource for health care professionals faced with a child with ESKD at end of life.

Methods

For each medication included within the APPM formulary, further information was sought and collated from the following sources; APPM, the Renal Drug Database, British National Formulary for Children, each Summary of Product Characteristics, Martindale and Micromedex. Data collected included information from manufacturers, studies and case reports relating to drug safety, side effects, pharmacokinetics and dose adjustments in renal impairment.

Using these sources, each medicine was evaluated and assigned a safety rating for use in ESKD by the lead author; red, amber and green. A red safety rating signifies that the medicine is contraindicated in ESKD and should only be considered where no other alternatives exist. An amber safety rating signifies the medicine can be used but an alternative dose/dosage interval may be required depending on renal function. A green medication is safe to use in ESKD and does not require any dose/dosage interval modification. Ratings were reviewed and confirmed by a senior renal pharmacist.

Medicines were then grouped according to the most common indication for use in end of life care, so that they are accessible by symptom group.

Discussion

The requirement for end of life care in paediatric patients is thankfully scarce, and often requires the input of dedicated specialist supportive care teams. Many medications used to alleviate symptoms of dying are renally cleared and so may have additional/more profound adverse effects, or may hasten death. Though this may sometimes be unavoidable, alternatives may exist. However, end of life care is a very small fraction of any given medical curriculum and is recognised as an area of anxiety for many healthcare professionals, including paediatric nephrologists.

We have created a resource that we hope will be of use in supporting both nephrology and supportive care colleagues in providing the optimum medication for symptom control at end of life in children with ESKD. Dissemination of this resource and assessment of its utility are the next steps.

Poster number: 217

Submission number: 611

Using Intervention Mapping to develop a supported self-management diet and physical activity intervention for adults with non-dialysis chronic kidney disease to promote weight loss

Miss Susan Rowley

British Psychological Society, Newcastle upon Tyne

Miss Susan Rowley

Biography

Susan Rowley is a Trainee Health Psychologist (via the independent Stage 2 route) and has worked for 14 years as a renal nurse in the Freeman Hospital, Newcastle upon Tyne. Her supervisor is Professor Darren Flynn (Professor of Applied Health and Social Care Research, HCPC-Registered Practitioner Health Psychologist) at Northumbria University. A collaboration with her supervisor, clinical and academic colleagues and people living with Chronic Kidney Disease (CKD) who are members of the Tyneside Kidney Patients' Association, has led to the development of a theory- and evidence-based supported self-management diet and physical activity intervention programme (Diet And phYsicaL activity for weIGHT loss for adults with Chronic Kidney Disease - DAYLIGHT CKD). The programme is underpinned by Social Cognitive Theory and Intervention Mapping, and informed by a systematic review of literature and research involving people with non-dialysis CKD. Susan and her research team is about to embark on a service improvement study (funded by Northern Counties Kidney Research Fund) to assess the feasibility of DAYLIGHT CKD in General Nephrology Clinics at Freeman Hospital. This will enable optimisation of the intervention to inform an application for funding to conduct a multi-centre pilot randomised trial of DAYLIGHT CKD.

Abstract

Introduction

One in three cases of advanced kidney disease (chronic kidney disease [CKD] stages 4 and 5) in people aged 40 to 79 in the UK is attributable to overweight or obesity.[1] Weight loss can delay or halt the need for dialysis,[2,3] with improved health outcomes such as reduced risk of cardiovascular disease,[4] better quality of life,[5] and reduced healthcare utilisation costs.[6] However, hospital renal services do not provide support for weight management until people are on dialysis.[7] Furthermore, GPs have limited referral options, due to local funding constraints, for people with non-dialysis CKD and overweight /obesity.[11,12] Using a structured development process, we designed a supported self-management dietary and physical activity intervention for weight loss in people with non-dialysis CKD attending renal outpatients' clinics: Diet And phYsicaL activity for weIGHT loss for adults with Chronic Kidney Disease (DAYLIGHT CKD).

Methods

We used Intervention Mapping[10] to guide intervention development (Figure 1). Step 1 involved a needs assessment to create a logic model of the problem of adverse health and quality of life outcomes in people with non-dialysis CKD with BMI $\geq$ 30kg/m^2 (Figure 2). The needs assessment incorporated findings of a systematic review,[11] input from engagement meetings with members of the local Tyneside Kidney Patients' Association (TKPA), including an online survey of people with non-dialysis CKD (unpublished report) to determine barriers and enablers of diet and physical activity behaviour change. Step 2 also sought to identity behavioural outcomes and modifiable determinants of behaviour (using the Theoretical Domains Framework[12]). Step 3 linked determinants of behaviour with theory-based behaviour change techniques[13] (BCTs) and constructs from Social Cognitive Theory.[14] We operationalised the BCTs into a structured intervention along with supporting information and tools. Step 4 involved engaging with members of the TKPA to co-design intervention materials with reference to the strategies identified in step 3. A protocol for a service improvement (step 5) and an evaluation plan (step 6) were then developed. A diagrammatic summary of the development process is shown in Figure 3.

Results

The development process led to the design of a structured intervention process (Figure 4), supported by printed materials (information booklet on the benefits and choices for making changes to diet and physical activity). Key intervention processes are assessing readiness to change, a pros and cons exercise, personalised goal setting (behaviour and outcomes), establishing preferences for choice of diet and physical activity, and the development of personalised action and coping plans. Participants receive a follow-up call one week after the initial appointment, and a review appointment to discuss progress.

Discussion

We are poised to begin a service improvement study to establish the feasibility and acceptability of DAYLIGHT CKD, funded by Northern Counties Kidney Research Fund. We aim to recruit up 20 people with non-dialysis CKD in a General Nephrology Clinic at an NHS acute hospital in North East England to participate in the service improvement study. This will enable optimisation of the intervention to inform a grant application to conduct a multi-centre pilot randomised trial of DAYLIGHT CKD.

Personal Determinants

Lack of knowledge of the risks that overweight/obesity poses for CKD progression and the subsequent need for dialysis and in turn a kidney transplant

Lack knowledge about the benefit of increasing physical activity (combined with dietary change) for weight loss, slowing/halting deconditioning and management of comorbidities such as T2D

Lack knowledge about dietary options and skills for selection of ingredients and cooking in a renal friendly way (restricting dietary intake of sodium, potassium, and phosphate)

Lack of knowledge about options for physical activity (and how this is different from exercise)

Lack of knowledge and skills described above leading to weak intentions (motivation) and confidence (self-efficacy) to change their diet and physical activity

Mental health issues such as anxiety and depression, and limited mobility and fatigue can reduce motivation to engage in physical activity and dietary change

Inability to experience sour, bitter and savoury tastes may drive preferences for salty and sugary foods

Different preferences for 1-2-1 supervised support to change

Environmental Determinants

Lack of evidence-based interventions for weight loss in CKD in the general nephrology clinic and staff without training in behaviour change

Monetary costs of commercial dietary change and gyms or exercise classes being unaffordable

Digital access and literacy

Medical clearance from a General Practitioner to satisfy a gym's insurance needs

Lack of knowledge about the value of weight loss for CKD from

Behaviour of At-Risk Group

Energy intake/expenditure imbalance that leads to weight gain

Weight loss methods used might only work in the short term, and could be unsafe if on sodium, potassium and phosphate restrictions

Do not undertake physical activity / exercise that is sufficient to confer benefits for their health and well-being

Environmental Conditions

People with CKD attending the General Nephrology Clinic are not provided with information and support for mental health or to change their diet and physical activity for weight loss

There is no education from the clinical team on ways of increasing physical activity (e.g. using a standing desk at work, using the stairs instead of the lift, doing housework or gardening) and differentiating this from exercise

The clinical team do not have a consistent (in every locality) referral pathway for specialist weight management (even if it is available, it might not accept people with stage 4 CKD)

People with CKD have difficulty explaining to their friends and family the reasons for them needing to lose weight in relation to their CKD, and so may lack social / emotional support to make changes to their diet and physical activity

Health Outcomes

-Overweight/obesity leads to premature mortality & morbidity from cardiovascular disease and peripheral vascular disease; leading to:

-↓muscle mass

-↑ muscle weakness / physical disability

-↑ rate of deterioration of kidney function leading to earlier need for dialysis or transplant

Quality of Life:

Lower quality of life due to:

- burden of CKD progression and co-morbidities

Non-behavioural factors

Genetic risk for CKD & co-morbidities

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Poster number: 218

Submission number: 364

The impact of interventions for people with chronic kidney disease on health-related quality of life: A systematic review

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Dr Thomas Phillips

Biography
Tom Phillips is a renal registrar based in the Wessex Deanery currently working as a research fellow at the University of Southampton and University Hospital Southampton. He has an interest in health-related quality of life for people with chronic kidney disease and large data-based studies. He is attached to the Kidney Research UK funded project NURTuRE-CKD examining health-related quality of life outcomes with University of Southampton as sponsor. He is also a data science fellow in the Research and Development department of University Hospital Southampton.

Abstract

Introduction

Health-related quality of life (HRQoL) is poorer for those with chronic kidney disease (CKD) than the general population and worsens as CKD progresses. Evidence is mixed as to which interventions improve HRQoL for those with CKD, and HRQoL is often under-reported in randomised controlled trials where it is most commonly a secondary outcome. Reviews including HRQoL as an outcome have thus far focussed on the impact per intervention, therefore we aimed to ascertain which interventions, of any type, have an impact on HRQoL outcomes for those with non-dialysis dependent CKD (NDD-CKD).

Methods

The protocol was prospectively registered on PROSPERO (CRD42022364474) and PRISMA guidelines were followed. Inclusion criteria were randomised controlled trials in an NDD-CKD population (excluding transplant recipients), any intervention type, usual care/placebo comparators, using validated and

reported HRQoL outcomes measures. Databases searched were Embase, Medline, PsychINFO, CINAHL plus, Web of Science, PubMed, and Google Scholar, with reference searching of included studies. Reports were independently screened by two researchers who also performed data extraction and quality assessment (using the Cochrane Risk of Bias 2.0 tool). Synthesis was undertaken using Synthesis without Meta-analysis (SWiM) methods. Conversion to one-sided p-values, synthesising outcomes in albatross plots and combining p-values via Fisher's method was performed using the metap package in R. HRQoL measures were broken down into physical, mental, kidney disease symptoms, adverse effects of kidney disease, burden of kidney disease, overall kidney disease, and overall HRQoL domains for analysis.

Results

Searches yielded 8983 records, and 39 studies met inclusion criteria, with a total of 11,940 participants. Nine groups were formed based on type of intervention, with data synthesis possible in the eight groups with more than one study (*Figure 1*). 26 (66%) studies were rated as having high risk of bias, largely due to frequent lack of blinding and HRQoL being a patient reported outcome. 37 studies had sufficient data for presentation in albatross plots (*Figure 2*). Using combined p-values for all HRQoL outcomes in each group of studies, benefit to HRQoL in at least one study was shown for education interventions (p<0.001, seven studies, none with low risk of bias), exercise interventions (p<0.001, eight studies, all with high risk of bias), medications to treat CKD-related anaemia (p<0.001, eight studies, four with low risk of bias), nutritional interventions (p<0.001, four studies, all with high risk of bias) and weight loss interventions (p<0.001, two studies, one with low risk of bias). No benefit to HRQoL was shown for medications aimed at slowing CKD progression (p=0.492, five studies), medications for depression (p=0.266, two studies) and medications to treat acidosis (p=0.99, two studies).

Discussion

This review identified several interventions with evidence of benefit to HRQoL for people with NDD-CKD, including medications to treat anaemia and weight loss interventions. Studies of education, exercise and nutritional interventions showed potential benefit, but with high risk of bias. Further high-quality randomised controlled trials of interventions for people with NDD-CKD should include and report HRQoL outcomes, in addition to targeting potentially modifiable determinants of HRQoL in these groups.

First author of study and year of publication	Country	n total participants	CKD stages included [1]	Baseline mean ± SD / median (IQR) eGFR of total participants (ml/min/1.73m[2])	Intervention	Comparator	Blinding	Follow-up duration	HRQoL primary/ secondary outcome	HRQoL measure(s) used	Risk of bias [2]
Education and behvioural interventions											
Sarker, 2022	Bangladesh	126	G1-3b	N/A	Education and home visits for BP monitoring	Usual care	Unblinded	6 months	Secondary	EQ-5D-5L	Some concerns
Lee, 2022	Taiwan	76	G3b-5	36.9 ± 20.8	Patient self-management education sessions	Usual care	Single blind	6 months	Primary	SF-12	High
Li, W, 2020	Taiwan	60	G1-4	66.5 ± 23.6	Health management platform and clinical support	Usual care	Unblinded	3 months	Secondary	KDQOL-36	High
Lin, 2021	Taiwan	108	G1-3a	64.8 ± 19.1	Health coaching and education	Usual care	Single blind	3 months	Primary	WHO-QOL-BREF	High
Nguyen, 2018	Vietnam	135	G3-5	30.9 ± 14.3	Education and self-management programme	Usual care	Single blind	4 months	Secondary	SF-36	High
Shah, 2018	USA	125	G1-5 or A2-3	103 ± 30	Biweekly home visits for education on lifestyle	Usual care	Unblinded	12 months	Secondary	KDQOL-36	High
Teng, 2021	Taiwan	120	G1-3b	54.9 ±18.5	Structured behaviour change sessions and education	Usual care	Unblinded	30 months	Secondary	WHO-QOL-BREF	High
Exercise interventions											
Bohlke, 2022	Brazil	150	G3a-4	63.4	Aerobic and resistance training	Usual care	Unblinded	32 months	Secondary	SF-36	High
Headley, 2015	USA	51	G3a-3b	47.6 ± 12.2	Aerobic training three times per week	Usual care	Unblinded	4 months	Secondary	SF-36	High
Rahimimoghadam, 2018	Iran	50	G2-3b	43.4 ± 3.3	Pilates sessions	Usual care	Unblinded	5 months	Primary	KDQOL-36	High
Rossi, 2014	USA	119	G3a-4	N/A	Guided exercise twice per week	Usual care	Unblinded	3 months	Primary	SF-36	High
Tang, 2016	China	90	G1-3b	Creatinine 77.9 umol/L ±37.5	Aeobic exercise with weekly follow-up at home/clinic	Usual care	Unblinded	3 months	Secondary	KDQOL-36	High
Thompson, 2022	Canada	44	G3b-4	28 (21, 37)	In-centre and home-based exercise programme	Usual care	Unblinded	6 months	Secondary	SF-12, EQ-5D	High
Uchiyama, 2021	Japan	46	G4	23.2 ± 4.7	Home-based individualised aerobic exercise programme	Usual care	Unblinded	6 months	Primary	KDQOL-36	High
Van Craenenbroeck, 2015	Belgium	48	G3a-4	38.6 ± 12.9	Home-based aerobic training	Usual care	Unblinded	3 months	Secondary	KDQOL-36	High
Health service organisation											
Saudan, 2020	Switzerland	242	G3b-4	34.0 ± 8.0	Combined secondary and primary care management	Usual care	Unblinded	24 months	Secondary	KDQOL-36	High
Medications aimed at slowing CKD progression											
Li, P, 2015	China	180	G1-2	90.4 ± 35.9	Tangshen formula (Chinese herbal medicine)	Placebo	Double-blind	6 months	Secondary	WHO-QOL-BREF	Low
Weir, 2023	Canada	533	G3a-4	33 (12)	Micro-particle curcumin	Placebo	Double-blind	6 months	Secondary	SF-36	Low
Akizawa, 2009	Japan	479	All NDD-CKD	22.3 ± 10.8	AST-120	Usual care	Unblinded	24 months	Secondary	SF-36	High
Cha, 2016	Korea	538	G3a-4	26.7±7.5	AST-120	Usual care	Unblinded	36 months	Secondary	SF-36	High
Cha, 2022	Korea	150	G3a-4	33.8 ± 12.5	AST-120	Usual care	Unblinded	11 months	Secondary	KDQOL-36	High
Medications to treat depression											
Hedayati, 2017	USA	201	G3a-5	N/A	Sertraline	Placebo	Double-blind	3 months	Secondary	KDQOL-36	Low
Saleh-Arong, 2022	Thailand	43	G3a-5	18.3 ± 16.3	Argomelatine	Usual care	Unblinded	2 months	Secondary	WHO-QOL-BREF	Some concerns
Medications treating acidosis secondary to CKD											
Witham, 2020	UK	300	G4-5	19.0 ± 6.5	Sodium bicarbonate	Placebo	Double-blind	24 months	Secondary	EQ-5D-3L, KDQOL-36	Low
Melamed, 2020	USA	149	G3a-5	36.3 ± 11.2	Sodium bicarbonate	Placebo	Double-blind	24 months	Secondary	SF-36	Some concerns
Medications treating anaemia secondary to CKD											
Bhandari, 2021	UK	54	G3b-5	31.1±9.6	Ferric derisomaltose/iron isomaltoside	Placebo	Double-blind	3 months	Secondary	SF-36	Low
Drueke, 2006	UK	75	G3a-4	35 ± 12	Ferric carboxymaltose	Placebo	Double-blind	3 months	Secondary	KDQOL-36	Low
Greenwood, 2023	Global	614	G3a-5	N/A	Daprodustat	Placebo	Double-blind	7 months	Secondary	SF-36	Low
Johansen, 2023	Global	4038	G3a-4	34 (27 - 43)	Darbepoetin alfa to target haemoglobin 13 g/dL	Placebo	Double-blind	48 months	Secondary	SF-36	Low
Lewis, 2011	Australia & NZ	155	G3a-4	25.5 ± 11.0	Epoetin beta to target haemoglobin 12-13 g/dL	Usual care	Unblinded	24 months	Secondary	SF-36	Some concerns
Roger, 2004	Global	603	G3b-4	24.6±6.2	Epoetin beta to target haemoglobin 13-15 g/dL	Usual care	Unblinded	24 months	Secondary	SF-36	High
Roger, 2013	Australia & Canada	51	G3a-4	28.2 ± 8.2	Darbepoetin alfa to target haemoglobin >13 g/dL	Placebo	Single blind	9 months	Secondary	SF-36	High
Singh, 2006	USA	1432	G3a-4	27.2 ± 8.9	Epoetin alfa to target haemoglobin >13.5 g/dL	Usual care	Unblinded	36 months	Secondary	SF-36	High
Nutrition intervention											
Campbell, 2008	Australia	60	G4-5	22.7 ± 7.1	Dietary education and self-management	Usual care	Unblinded	3 months	Primary	KDQOL-36	High
Hamidianshirazi, 2023	Iran	120	G3a-4	32.3 ± 1.6	Diet therapy and nutritional education	Usual care	Unblinded	6 months	Primary	SF-12	High
Hosojima, 2022	Japan	102	G3a-4 & A2	N/A	Low protein food replacement	Usual care	Unblinded	6 months	Secondary	KDQOL-36	High
Sanchez, 2010	Spain	49	G3b-5	25.4 ± 8.2	Low protein food replacement	Usual care	Unblinded	6 months	Primary	SF-36	High
Weight loss interventions											
Mosenzon, 2019	Global	324	G3a & 3b	48.0 ± 10.0	Oral semaglutide	Placebo	Double-blind	6 months	Secondary	SF-36	Low
Cohen, 2022	Brazil	100	G1-2 & A2	95.4 ± 18.9	Gastric bypass (Roux-en-Y)	Best medical treatment	Unblinded	24 months	Secondary	SF-36	High

[1] - as per KDIGO CKD guidelines, 2012, [2] using the Cochrane Risk of Bias 2.0 tool

N/A - not available, HRQoL - health-related quality of life, SF-12 - short form 12, SF-36 - short form 36, KDQOL-36 - kidney disease quality of life 36, EQ-5D-5L - EuroQoL 5 dimension 5 level, WHO-QOL-BREFWorld Health Organization Quality-of-Life Scale

Figure 1. Summary table of included studies categorised by type of intervention
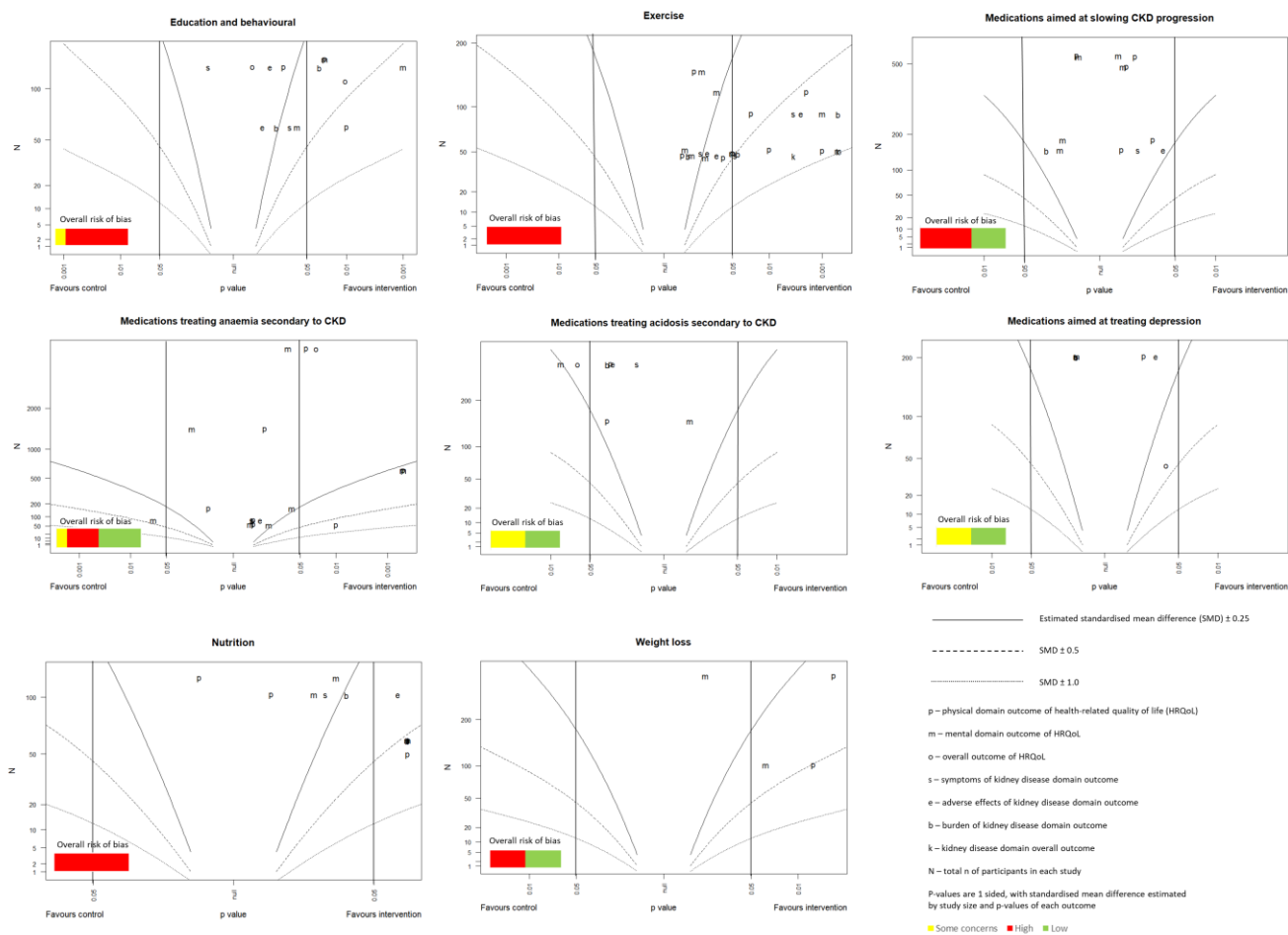
Figure 2. Albatross plots showing p-values for health-related quality of life outcomes in each study, with effect sizes (standardised mean difference) estimated according to study size

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

PROSPERO (CRD42022364474)

Causes of non-elective hospitalisations among adult patients with chronic kidney disease in England (CIPHER): Clinical Practice Research Datalink 2010-2019

Dr. Paul Cockwell[1,2], Dr. Ruth Farmer[3], Dr. Remi Popoola[3], Dr. Louise Muttram[3], Dr. Christina Shay[4]

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Dr. Paul Cockwell

Biography

Paul Cockwell is a consultant physician and nephrologist at Queen Elizabeth Hospital, University Hospitals Birmingham, professor of nephrology at the University of Birmingham, and medical director for Long-term Conditions and Prevention for Birmingham and Solihull Integrated Care System. Paul is president of UK Kidney Association, the representative professional body for UK renal health care professionals. He helped lead the development in Birmingham of one of the largest and most comprehensive renal services in Europe and developed a large integrated clinical research infrastructure supporting multiple outputs. He publishes widely in chronic kidney disease, paraprotein associated kidney disease and patient reported outcome measurements.

Abstract

Introduction:

Patients with chronic kidney disease (CKD) are at higher risk of non-elective hospitalisation compared to the general population, which is associated with an increased risk of death and accounts for disproportionate resource utilisation. There are limited population-level estimates of the causes of non-elective hospitalisation for patients with CKD in England. Therefore, a population-based study was implemented to start to address this shortfall.

Methods:

This non-interventional, observational study utilised data from primary care electronic health records from the Clinical Practice Research Datalink (CPRD) AURUM and Hospital Episode Statistics (HES) admitted patient care (APC). Patients aged ≥18 years registered in CPRD with eligible linkage to HES between January 1, 2010 - December 31, 2019 with at least two eGFR measurements during that period were identified. CKD was defined by an eGFR <60 ml/min/1.73m^2 and/or presence of a uACR measurement ≥3 mg/mmol, both confirmed by a second measurement 90-365 days later. Start of follow-up (index) was set to the earliest date during the study period where CKD was confirmed. Non-elective admissions were defined as hospitalisations not planned in advance. Follow-up for

hospitalisations ended at the earliest of death, administrative censoring, or December 31, 2019. Patients with end stage kidney disease at index were excluded. Causes of hospitalisation during follow-up were based on three character-level ICD codes in the primary position. Where the same ICD-10 code was coded more than once within a hospitalisation, it was only counted once.

Results:

From a total population of 6.1 million adult patients meeting study inclusion criteria, 743,945 adults with CKD were identified (12.2%) with a median follow-up of 3.62 years. The mean age (SD) was 76.1 (11.5) years, 55.2% were female, and 89.8% were White. The majority (60.9%) of patients had stage 3a CKD (eGFR 45-59 ml/min/1.732 m^2) and 34.3% and 17.1% had a history of type 2 diabetes and heart failure at time of CKD confirmation, respectively. There were 1.45 million non-elective hospitalisations observed, with 449,128 (60%) of patients experiencing ≥ 1 non-elective hospitalisation during follow-up. The most frequent ICD-10 chapter indicated as primary cause of all non-elective hospitalisation was diseases of the circulatory system (19.4%), including heart failure (4.9%), ischaemic heart disease (myocardial infarction and angina) (3.5%), stroke (2.2%) and atrial fibrillation/flutter (1.9%). Infection was also a frequent cause of non-elective hospitalisation, including pneumonia of unspecified organism (7.8%), unspecified acute lower respiratory tract (2.5%), and other sepsis (2.7%). Frequent hospitalisation also occurred in patients with CKD due to fractures (3.5%) and injuries to the head (1.7%)

Discussion:

Non-elective hospitalisations are frequent among patients with CKD. Diseases of the circulatory and respiratory systems are overall most common causes, with pneumonia, ischaemic heart disease, and heart failure the most frequent modifiable reasons for admission. Ensuring that current shortfalls in primary and secondary prevention for patients with CKD through optimization of strategies such as vaccination and evidence based cardiovascular disease management will reduce rates of non-elective hospitalisation and other clinical outcomes and ensure best use of health care resources for patients with CKD.

Rates of eGFR and UACR testing in patients with confirmed chronic kidney disease by CKD stage and year of follow-up: Clinical Practice Research Datalink 2010-2019

Dr. Paul Cockwell[1], Dr. Chengan Du[2], Dr, Ruth Farmer[3], Dr. Remi Popoola[3], Dr. Louise Mu[3], Dr. Ling Zhang[2], Dr. Christina Shay[2]

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Dr. Paul Cockwell

Biography

Paul Cockwell is a consultant physician and nephrologist at Queen Elizabeth Hospital, University Hospitals Birmingham, professor of nephrology at the University of Birmingham, and medical director for Long-term Conditions and Prevention for Birmingham and Solihull Integrated Care System. Paul is president of UK Kidney Association, the representative professional body for UK renal health care professionals. He helped lead the development in Birmingham of one of the largest and most comprehensive renal services in Europe and developed a large integrated clinical research infrastructure supporting multiple outputs. He publishes widely in chronic kidney disease, paraprotein associated kidney disease and patient reported outcome measurements.

Abstract

Introduction:

The NICE chronic kidney disease (CKD) treatment guidelines recommend regular laboratory measurements of both kidney function (eGFR) and damage (proteinuria) to appropriately inform efforts to prevent and treat progression of CKD. Recommendations also indicate frequency of such testing should increase with CKD progression. There are few data on rates of testing in patients with confirmed CKD with particularly paucity in patients with various stages of CKD.

Methods:

This non-interventional, observational study utilised data from primary care electronic health records from Clinical Practice Research Datalink (CPRD) AURUM. Patients aged ≥18 years with CKD registered in CPRD with at least one year of follow-up (FU) between January 1, 2010 and December 31, 2019 were identified. CKD was defined by an eGFR <60 ml/min/1.73m^2 and/or presence of a uACR measurement ≥3 mg/mmol, both confirmed by a second measurement 90-365 days later (index). Patients with eGFR<9 ml/min/1.73m^2 at index were excluded. Frequency of renal testing (eGFR and UACR) for each complete year of FU was quantified starting the day after index and patients were censored the last day of the

final complete calendar year of FU after index. Frequency of renal testing per FU year was calculated overall and by CKD stage and level of albuminuria at index.

Results:

In the 650,565 patients with CKD identified, mean age (SD) was 76.1 (11.3) years, 55.4% were female, and 88.5% White. Most (62.0%) patients had stage 3a CKD (eGFR 45-<59 ml/min/1.73 m^2) at index. Among patients with UACR measurements within 1 year prior to index (54.1%), 49.3% were A1 (<3 mg/mmol), 43.4% A2 (3-30 mg/mmol) and 7.3% A3 (>30 mg/mmol) at index. During the first year of FU, 81.45% of patients had 1+ eGFR test whereas 39.2% had 1+ UACR test. Patients more frequently received 1+ eGFR per year over subsequent years of FU but the low proportion with 1+ UACR test per year remained stable for UACR. The mean (SD) number of eGFR and UACR tests performed per patient in the first year of FU was 2.09 (2.39) and 0.49 (0.70), respectively. More frequent eGFR testing was observed with lower eGFR at index and across subsequent years of FU. Frequency of UACR testing was lower at more advanced stages of CKD at index in all FU years, however, no trends in UACR testing frequency were observed by level of albuminuria at index.

Discussion:

This evidence from a population-based sample of patients with confirmed CKD in England, indicates that eGFR is being monitored in the majority of patients, yet UACR testing is suboptimal according to NICE guidelines regardless of level of kidney function or level of albuminuria. Although eGFR testing is more frequent at more advanced stages of CKD, UACR testing seems to become less frequent with more advanced stages of CKD. With emergence of new therapies to prevent progression of CKD, efforts to increase frequency of UACR testing are needed (particularly in earlier CKD stages) to ensure that patients who are at risk of worsening CKD and albuminuria receive appropriate management.

Poster number: 221

Submission number: 256

Chronic Kidney Disease during pregnancy: a UK cohort of 7,570 deliveries using UKRR and RaDaR cohort linkage with Hospital Episode Statistics

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Dr Shalini Santhakumaran

Biography

Shalini Santhakumaran is a Senior Statistician at the UK Renal Registry, where she works on a variety of audit and research projects concerning CKD and AKI. Recent research areas include validity of CKD coding in electronic health records, COVID-19 in kidney replacement therapy recipients, and symptom burden in CKD patients.

Abstract

Introduction

People living with Chronic Kidney Disease (CKD) have a higher risk of adverse pregnancy outcomes and reduced kidney function. The 'PREgnancy-associated-progression-of-chronic-kidney-DIsease:development-and-validation-of-a-Clinical-predictive-Tool' (PREDICT) study aims to develop and validate models to predict the likelihood of CKD progression and poor neonatal outcomes. Here we describe national data collated for PREDICT including renal and pregnancy outcomes.

Methods

We analysed data on all pregnancies with a diagnosis of CKD prior to delivery in 1997-2021 in the Hospital Episode Statistics (HES) dataset (an England-wide dataset on hospital admissions held by NHS Digital). Data were linked to the UK Renal Registry (UKRR) and the National Registry of Rare Kidney Diseases (RaDaR). CKD in pregnancy was defined as any of the following recorded prior to delivery: ICD-10 code of N18 in HES, eGFR<90ml/min/1.73m^2 in UKRR-RaDaR, transplant or chronic dialysis in UKRR, CKD treatment code in the UKRR, enrolment to RaDaR. The prediction model sub-cohort included those with a median eGFR<90ml/min/1.73m^2 in the 2 years prior to conception, and not receiving chronic dialysis at conception. We describe maternal characteristics and birth outcomes, including eGFR for those in the sub-cohort.

Results

There were 7,570 deliveries recorded amongst 5,578 females with CKD in pregnancy, including 1,137(15%) pregnancies with a kidney transplant and 181 pregnancies (2.4%) on chronic dialysis. Prior to

delivery 2,079(27%) of women had chronic hypertension and 639(8.5%) had diabetes (including diabetic nephropathy). 3,787(50%) deliveries were by Caesarean section and 718(9%) were assisted vaginal deliveries. There were 69(0.9%) deliveries resulting in stillbirth but birth outcome was unknown in 16%. Of the 5,858 births (77%) with a gestational age recorded, 1,912(33%) were preterm (<37weeks) and 812(14%) were very preterm (<34weeks). 235/5,609(4.2%) births were small for gestational age (<3rd centile using INTERGROWTH-21 standards for those with complete data). Excluding 81 pregnancies already on dialysis at conception, 807(11%) went on to require chronic dialysis, at a median of 4.3 years after conception (interquartile range (IQR) 1.6,7.8), and 677(9%) received a transplant (or a new transplant for those already transplanted at conception) (median IQR 6.4(3.8,10.0) years after conception).

In the sub-cohort of 828 pregnancies with pre-conception eGFR, 365(44%) had a transplant at the time of conception. In 765 pregnancies which also had post-delivery eGFR data, 561(73%) had a reduction in eGFR with 227(30%) having a ≥25% reduction; figure-1 shows the progression of CKD from conception to up to 1 year after delivery.

Discussion

This is the largest UK study of pregnancy outcomes for people living with CKD reported to date. Linkage with UKRR-RaDaR provided reliable information on eGFR values and kidney replacement therapy, but highlighted the limitations of CKD/pregnancy coding in HES. The cohort had increased risk of being small for gestational age, with higher rates of stillbirth and preterm birth compared to population rates of 0.4% and 7.6% respectively. A third of women had a substantial reduction in eGFR post-delivery compared to pre-delivery; future work includes developing a prediction model for post-delivery eGFR.

Figure 1 Progression of CKD from pre-conception (median eGFR in the 2 years prior) to post-delivery (median eGFR from 6 weeks to 1 year after). Transplant includes those on transplant at conception who required a new transplant.
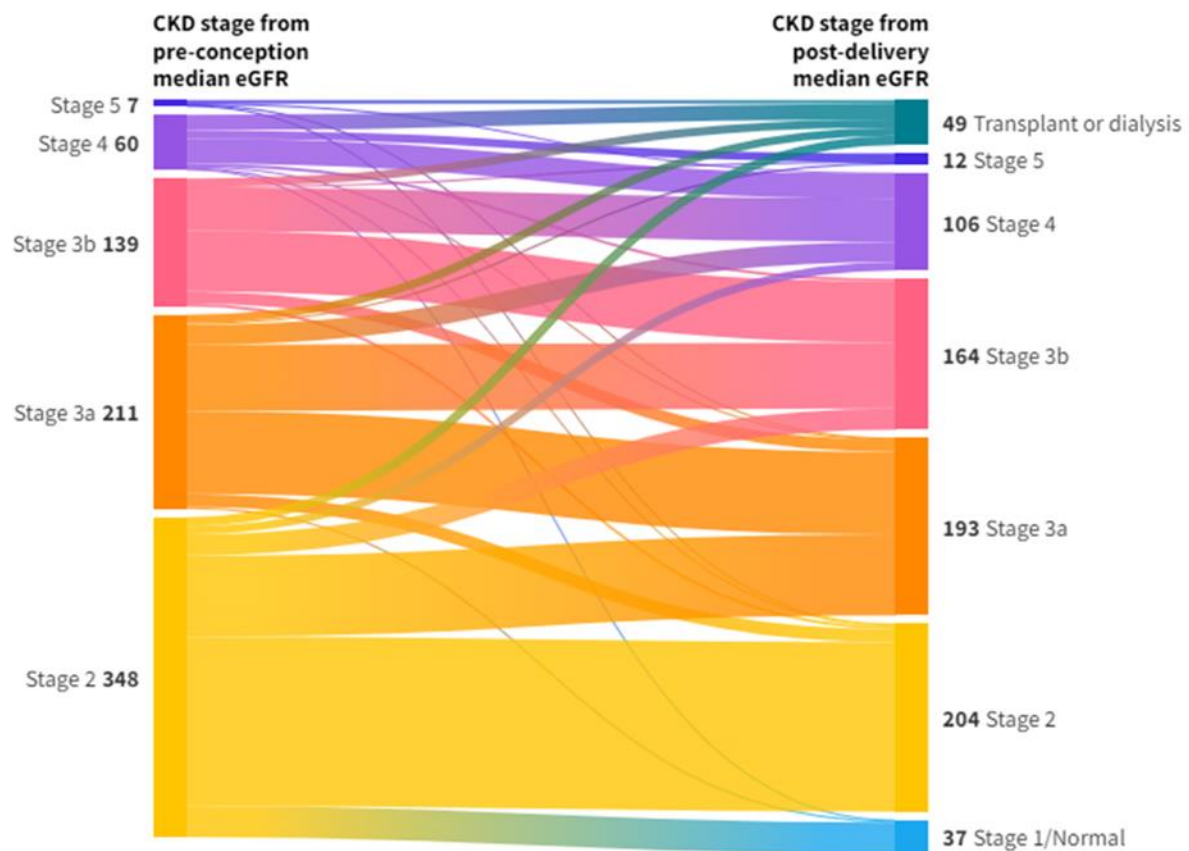
Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

The representation of multimorbidity and frailty in the development and validation of kidney failure risk prediction models - a systematic review

Dr Heather Walker[1], Dr Scott Day[2], Dr Robert Ker[3], Dr Christopher H Grant[4], Miss Catrin Jones[5], Dr Michael Sullivan[1,3], Dr Bhautesh Jani[5], Dr Katie Gallacher[5], Professor Patrick Mark[1,3]

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Dr Heather Walker

Biography
Heather Walker is a renal and general medicine clinical trainee in NHS Tayside, having undertaken her undergraduate training at the University of Dundee and obtaining a Bachelor of Medical Sciences (BMSc) in Forensic Medicine alongside her medical degree (MBChB). Within her postgraduate training she has undertaken an Academic Foundation post and secured a SCREDS clinical lectureship post in Renal Medicine at the University of Dundee. She is currently Out of Programme completing a Clinical Research Fellowship with the University of Glasgow, as part of the Multimorbidity PhD programme for Health Professionals. Research interests include the use of routinely collected data to study the epidemiology of kidney disease and improve patient outcomes and renal healthcare at a population level.

Abstract

Background: Prognostic models that identify individuals with chronic kidney disease (CKD) at highest risk of developing kidney failure help clinicians to make decisions and deliver precision medicine. People with CKD are very likely to have multiple long-term health conditions (multimorbidity) and often experience frailty. These factors impact progression of kidney disease and influence the risk of other outcomes such as death. It is unclear to what extent prognostic models, that estimate the risk of kidney failure, consider the impact of multimorbidity and frailty and whether these models are valid in such sub-populations.

This systematic review (CRD42022347295) describes and evaluates the representation of multimorbidity and frailty within cohorts used to develop and/or validate prognostic models assessing the risk of kidney failure in individuals with CKD. The review aims to determine if multimorbidity or frailty has been considered in relation to prediction of kidney failure and if reliable prognostic models exist for use in this population.

Methods: We included studies that described the derivation, validation or update of a kidney failure prognostic model (outcome assessed at ≥2 years) for use in adults with CKD and reported at least one measure of either discrimination or calibration. The primary outcome for the review was the

representation of multimorbidity or frailty in these models. An electronic search for published peer-reviewed articles involved MEDLINE, CINAHL Plus and the Cochrane Library – CENTRAL and was supplemented with manual review of references from previous systematic reviews and clinical guidelines.

Results: A total of 97 studies, reporting 121 different kidney failure prognostic models were identified. A total of 2,925,413 participants and 149,380 kidney failure events were included across all studies. Included participants had a mean age of 58.9 years (SD 9.6), 44.4% were female, with a mean eGFR of 47.5ml/min/1.73m^2 (SD 10.7). Only two studies reported multimorbidity, measured by Elixhauser Cormobidity Index and Charlson Co-morbidity Index (CCI), and a single study reported a self-reported proxy frailty measure. The rates of specific co-morbidities were reported in a greater proportion of studies: 67.0% (n=65) studies reported baseline data on diabetes, 54.6% (n=53) reported hypertension, and 39.2% (n=38) reported cardiovascular disease. No studies included frailty in model development and only one study considered multimorbidity as a predictor variable (via CCI). No studies assessed model performance in populations with multimorbidity. A single study assessed clinical utility of a model and referral algorithms considering frailty and the risk of kidney failure and death.

Conclusions: There is a paucity of kidney failure risk prediction models that consider the impact of multimorbidity and/or frailty in adults with CKD, resulting in a lack of clear evidence-based practice and guidance for multimorbid or frail individuals. These knowledge gaps should be explored to help clinicians know whether these models can be used for patients who experience multimorbidity and/or frailty.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

This review has been registered on PROSPERO (CRD42022347295).

The translation of interventional study findings for adults requiring maintenance dialysis into routine clinical practice: a systematic review

Dr Katherine L Hull[1,2], Dr Daniel S March[1,2], Dr Sherna Adenwalla[1,2], Ms Rahma Said[3], Professor Laura J Gray[3], Dr Victoria Cluley[4], Dr Matthew P.M. Graham-Brown[1,2], Professor James O Burton[1,2]

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Dr Katherine L Hull

Biography
I am a Nephrology Specialty Registrar from the University Hospitals of Leicester NHS Trust. I am current out of programme, undertaking a PhD at the University of Leicester as the Clinical Research Fellow on the National Institute for Health Research [HTA (NIHR127440)] funded NightLife study (PMID: 37573352). My PhD aims to explore and understand the factors that influence the translation of dialysis research findings and interventions into routine clinical service delivery and practice.

Abstract

Introduction

There are substantial delays in the translation of research findings into clinical practice. The aim of this systematic review (PROSPERO, CRD42021249460) is to explore the features of published randomised controlled trial (RCT) data in the dialysis population that associate with integration into nephrology clinical practice guidelines.

Methods

Eligible reports included studies of adults (≥18 years) requiring maintenance (≥3months) dialysis participating in RCTs of any intervention type. The outcomes of interest were exploratory: identification of the factors influencing the uptake of intervention studies into clinical guidelines. Searches were completed in MEDLINE, Embase, CINAHL, and CENTRAL. There were no limits on language or location. The search strategy was limited by publication date 01/01/2015 to 31/12/2018. Descriptive statistics are reported as frequencies with percentages, and median with interquartile range. Statistical testing included Chi-square test and Mann-Whitney U. The data were not appropriate for pooling or meta-analysis.

Results

Searching identified 7844 reports; 305 reports from 268 studies were included in the systematic review (Figure 1). Twenty-four (7.9%) reports from 22 (8.2%) studies were referenced in clinical guidelines. Of these reports, 20 (83.3%) were primary results publications, the median journal impact factor was 5.5 (IQR 2.9 to 9.1) and positive findings were published in 14 (58.3%) of the reports. Of the included studies, 11 (50.0%) were from North America, 18 (81.8%) occurring in haemodialysis units, 20 (90.9%) were parallel randomised controlled trials and testing the efficacy of an intervention was the most frequent primary purpose (13, 59.1% of studies). None of the studies included in the guidelines reported Patient Public Involvement and Engagement work, cost-effectiveness analysis, nor focussed on the peritoneal dialysis population.

Report characteristics associated with reference in clinical guidelines were: presence of financial disclosures, X^2(1, N = 305) = 5.40, P = 0.020, journal impact factor, Z = -3.43, P = < 0.001, and longer length of follow-up, Z = -2.96, P = 0.022. Study characteristics significantly associated with reference in the clinical guidelines were: continent of origin, X^2(3, N = 268) = 21.02, P = < 0.001, number of participating centres, X^2(1, N = 266) = 4.64, P = 0.031, assessment of clinical effectiveness, X^2(1, N = 268) = 7.80, P = 0.0052, presence of a power calculation, X^2(1, N = 268) = 4.18, P = 0.041, achievement of target sample size, X^2(3, N = 268) = 11.079, P = 0.011, and the actual sample size target, Z = -2.78, P = 0.005.

Discussion

Larger powered studies evaluating clinical effectiveness, conducted in North America, and published in higher impact factor journals, are associated with reference in clinical guidelines. However, less than 10% of RCT findings were actually included in the guidelines. These findings elucidate the following preliminary conclusions: 1) clinical guidelines are not utilising the entire evidence-base from randomised intervention studies; 2) utility of RCT data is limited due to methodology and outcome assessments; 3) literature review for guideline formulation may not be entirely systematic and inclusive, with bias from the country of study origin and journal impact factor.
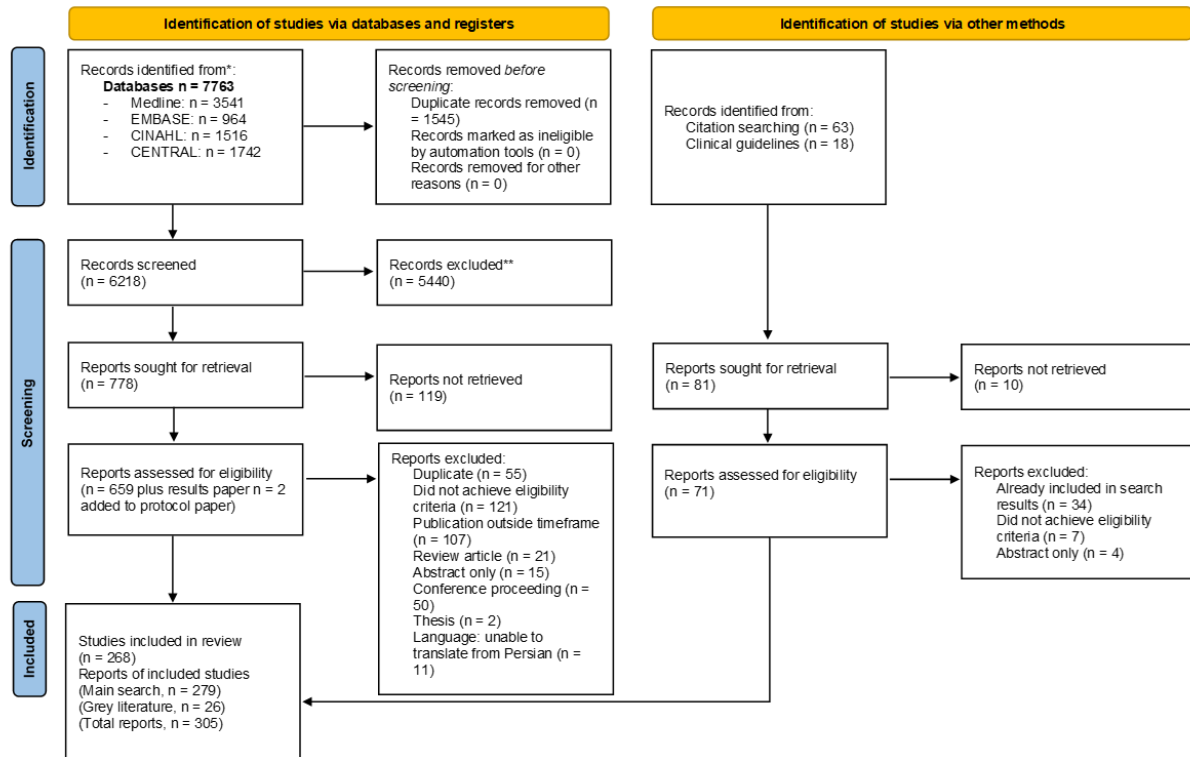
Figure 1 – PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram of database search and report selection

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

PROSPERO, CRD42021249460

Lean tissue mass is associated with mortality and adverse quality of life across different stages of chronic kidney disease: a systematic review and meta-analysis

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Dr Matthew Tabinor

Biography
Matthew Tabinor is a Speciality Registrar in Renal Medicine at the Queen Elizabeth Hospital in Birmingham. He is currently undertaking postgraduate research at Keele University (PhD student) into the associations between lean tissue mass and adverse outcomes in multiple long term conditions, including chronic kidney disease.

Abstract

Introduction
Loss of lean tissue mass (LLTM) commonly arises in long-term conditions (LTC), including chronic kidney disease (CKD), and is thought to be associated with mortality, frailty surrogates and poor quality of life. It remains unclear whether LLTM is directly associated with mortality in CKD after adjusting for the severity of CKD or the degree of multimorbidity, and whether such associations remain in other LTC with similar levels of multimorbidity, such as heart failure (HF).

Methods
A systematic review was conducted in adult CKD [kidney transplant (KT), CKD_{G3-5} or dialysis treated kidney failure (D-KF)] and HF patients who had whole body bioimpedance defined lean tissue mass (BI-LTM). The primary outcome was mortality, with secondary outcomes including hospitalisation and health related quality of life (HRQoL). The review was registered with PROSPERO (CRD42021240688) and was conducted according to PRISMA guidelines. Electronic database searches of MEDLINE, EMBASE, AMED, CINAHL, PsychInfo, Web of Science, CENTRAL, ICTRP and ISRCTN were searched from inception until June 2023. Data extraction and risk of bias assessments, using the Quality in Prognosis Studies (QUIPS) tool, was performed by two independent reviewers. Random effects meta-analysis was conducted using STATA SE16.2 using restricted maximum likelihood (REML) estimation.

Results

From 10,024 citations, 126 studies were identified (100 D-KF, 12 CKD$_{G3-5}$, 2 KT, 3 mixed CKD and 9 HF) reporting outcomes on 143,053 D-KF, 15,164 CKD$_{G3-5}$, 346 KTR and 3716 HF patients respectively. There were 1,227 deaths (over 2-5 years) in the HF studies and 16,471 deaths (over 1-20 years) in the CKD studies. The weighted mean eGFR$_{Creat}$ was 54 and 42 ml/min/1.73m^2 in the KT and CKD$_{G3-5}$ studies, with only 3 HF studies reporting any measure of renal function (all using categorical cut offs). In 87 studies survival analyses of all-cause mortality (ACM) showed that BI-LTM was associated with mortality in 67%, 100%, 85% and 74% of the HF, KT, CKD$_{G3-5}$ and D-KF studies respectively after adjusting for age, sex, diabetic status, comorbidity score, CRP / IL-6, albumin and bioimpedance defined fluid measures in 93%, 77%, 64%, 17%, 32%, 59% and 24% of analyses. Meta-analysis within D-KF studies reporting MVA revealed a 1-degree decrease in phase angle (pooled HR 1.82, 95%CI 1.50-2.20: Figure 1A) and lean tissue index < 10th percentile (pooled HR 1.48, 95%CI 1.31-1.66: Figure 1B) was associated with ACM. Leave one out meta-analysis and sensitivity analyses removing studies at high-risk of statistical analysis and study confounding bias confirmed these pooled estimates were robust. Of the studies reporting secondary outcomes including hospitalisation and HRQoL (including the Short Form-36 and Kidney Disease Quality of Life Instrument), 67% showed associations with BI-LTM.

Discussion

LLTM is associated with mortality and surrogates of frailty across all stages of CKD and in heart failure. This study confirms that LLTM potentially has an important role in the explanatory pathway for adverse outcomes in LTC, including CKD. Using BI-LTM may provide a way to identify early LLTM and target interventions to reduce the risk of adverse outcomes in these multimorbid cohorts.

1A. MVA - Phase angle – 1 degree decrease

Study	RRT	n(patient)	n(died)	BI_Time	FU	Hazard ratios with 95% CI	Weight (%)
Koh 2011	PD	128	35	PD-empty	2-3yr	2.56 [1.75, 3.75]	14.58
Huang 2019	PD	760	125	PD-full	3-4yr	1.71 [1.18, 2.48]	15.01
Bae 2022	HD	191	21	postHD	3-4yr	1.96 [1.18, 3.25]	10.11
Beberashvilli 2010	HD	81	22	postHD	2-3yr	3.70 [1.72, 7.98]	5.24
Beberashvilli 2014a	HD	91	38	postHD	4-5yr	1.64 [1.42, 1.90]	28.55
Beberashvilli 2014b	HD	250	64	postHD	1-2yr	1.33 [0.97, 1.84]	17.32
Shin 2017	HD	142	15	preHD	2-3yr	1.79 [1.04, 3.06]	9.19
Overall						1.82 [1.50, 2.20]	

Heterogeneity: $\tau^2 = 0.03$, $I^2 = 46.72\%$, $H^2 = 1.88$

Test of $\theta_i = \theta_j$: Q(6) = 11.16, p = 0.08

Test of $\theta = 0$: z = 6.15, p = 0.00

1B. MVA - Lean tissue index < 10th percentile

Study	RRT	n(patient)	n(died)	BI_Time	FU	Hazard ratios with 95% CI	Weight (%)
Marcelli 2015	HD	37345	3458	preHD	<1yr	1.53 [1.43, 1.64]	44.21
Rosenberger 2014	HD	748	107	preHD	4-5yr	1.66 [1.11, 2.49]	7.24
Zavacka 2020	HD	748	107	preHD	4-5yr	1.27 [1.07, 1.49]	26.07
Zhang 2019	HD	123	20	preHD	2-3yr	3.24 [1.06, 9.91]	1.09
Li 2022	PD	104	18	PD-full	2-3yr	3.14 [1.12, 8.80]	1.27
Kim 2019	HD	142	28	unclear	4-5yr	2.77 [1.10, 6.97]	1.58
Mizuiri 2020	HD	215	64	postHD	3-4yr	1.51 [0.89, 2.57]	4.51
Kim 2021a	PD	160	23	unclear	2-3yr	2.10 [0.77, 5.71]	1.35
Kittiskulnam 2021	PD	555	196	PD-full	2-3yr	1.27 [0.95, 1.69]	12.69
Overall						1.47 [1.31, 1.66]	

Heterogeneity: $\tau^2 = 0.01$, $I^2 = 25.56\%$, $H^2 = 1.34$

Test of $\theta_i = \theta_j$: Q(8) = 11.84, p = 0.16

Test of $\theta = 0$: z = 6.47, p = 0.00

Figure 1. Meta-analysis of studies reporting multivariable analyses (MVA) for all-cause mortality (ACM): for a 1-degree degree in phase angle (1A) or lean tissue index < 10th percentile (1B).

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

PROSPERO - CRD42021240688.

Poster number: 225

Submission number: 450

Sex-divergent associations between fat free mass and weight with mortality in the UK Biobank cohort: findings from sequences of regressions analyses

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Dr Matthew Tabinor

Biography
Matthew Tabinor is a Speciality Registrar in Renal Medicine at the Queen Elizabeth Hospital in Birmingham. He is currently undertaking postgraduate research at Keele University (PhD student) into the associations between lean tissue mass and adverse outcomes in multiple long term conditions, including chronic kidney disease.

Abstract

Introduction
There is growing evidence that muscle mass (MM) loss, observed in long term conditions (LTCs), including chronic kidney disease (CKD), is associated with mortality. This study aimed to explore the direct association between MM and mortality, having controlled for the combined influence of ageing, long term conditions (LTCs), inflammation, renal function and body weight. Furthermore, we sought to explore whether this association differed between the biological sexes.

Methods
An observational study was conducted using the UK Biobank cohort. Adults were recruited between 2007-2010 at 22 UK centres. MM was estimated using bioimpedance defined whole body fat-free mass (BI-FFM: Tanita BC418). Primary outcome was all-cause mortality (ACM), with the cause / date of death being obtained from the NHS Information Centre (England and Wales) and NHS Central Registry (Scotland). Follow up was defined as the period between the first visit date to either date of death / the latest date for central registry downloads (December 2021). Estimated glomerular filtration rate using creatinine (eGFR$_{Creat}$) or cystatin-C (eGFR$_{cystatin-C}$) were calculated (CKD-EPI 2009 equation without ethnicity correction). Participants were excluded if they were on dialysis, died from SARS-CoV-2 infection or withdrew consent. Sequences of regressions analyses (SoRA), a graphical Markov modelling technique which assesses the complexity of direct and indirect pathways of association between blocks of variables which are ordered *a-priori* to reflect postulated directions of association, were fitted for both sexes.

Results
There were 500,589 participants eligible for analysis (272,623 females / 227,966 males). There were 33,755 deaths over a median follow up period of 12.58 (IQR 11.85-13.30) yrs. The male model revealed

per 5kg-higher BI-FFM (holding weight constant) was associated with lower odds of ACM in the eGFR$_{Creat}$ (OR 0.827, 95%CI 0.781-0.875) and eGFR$_{Cystatin-C}$ (OR 0.425, 95%CI 0.301-0.599) sub-models, whereas a 5kg-higher weight (holding BI-FFM constant) was associated with higher odds of ACM in the eGFR$_{Creat}$ (OR 1.070, 95%CI 1.027-1.115) and eGFR$_{Cystatin-C}$ (OR 1.395, 95%CI 1.170-1.663) sub-models. In contrast, the female model revealed a 5kg-higher BI-FFM (holding weight constant) was associated with higher odds of ACM in the eGFR$_{Creat}$ (OR 2.016, 95%CI 1.650-2.463) and eGFR$_{Cystatin-C}$ (OR 1.729, 95%CI 1.391-2.151: Figure 1) sub-models, whereas a 5kg-higher body weight (holding BI-FFM constant) was associated with lower odds of ACM in the eGFR$_{Cystatin-C}$ (OR 0.935, 95%CI 0.918-0.952) but not the eGFR$_{Creat}$ (OR 1.020, 0.970-1.072) sub-model. Inspection of the causal pathway suggested BI-FFM gains in men reflected genuine MM gains whereas in women this likely reflected worsening overhydration.

Discussion
Our analysis demonstrates sex-divergent associations between BI-FFM and/or body weight with ACM when estimated kidney function is accounted for. These associations suggest sex-specific explanations as to why MM loss leads to adverse outcomes in multimorbid populations and further characterises the sex-stratified nature of the "obesity paradox" in LTCs. Finally, this analysis highlights the need to use 3-compartmental bioimpedance methods to differentiate lean tissue mass from overhydration.
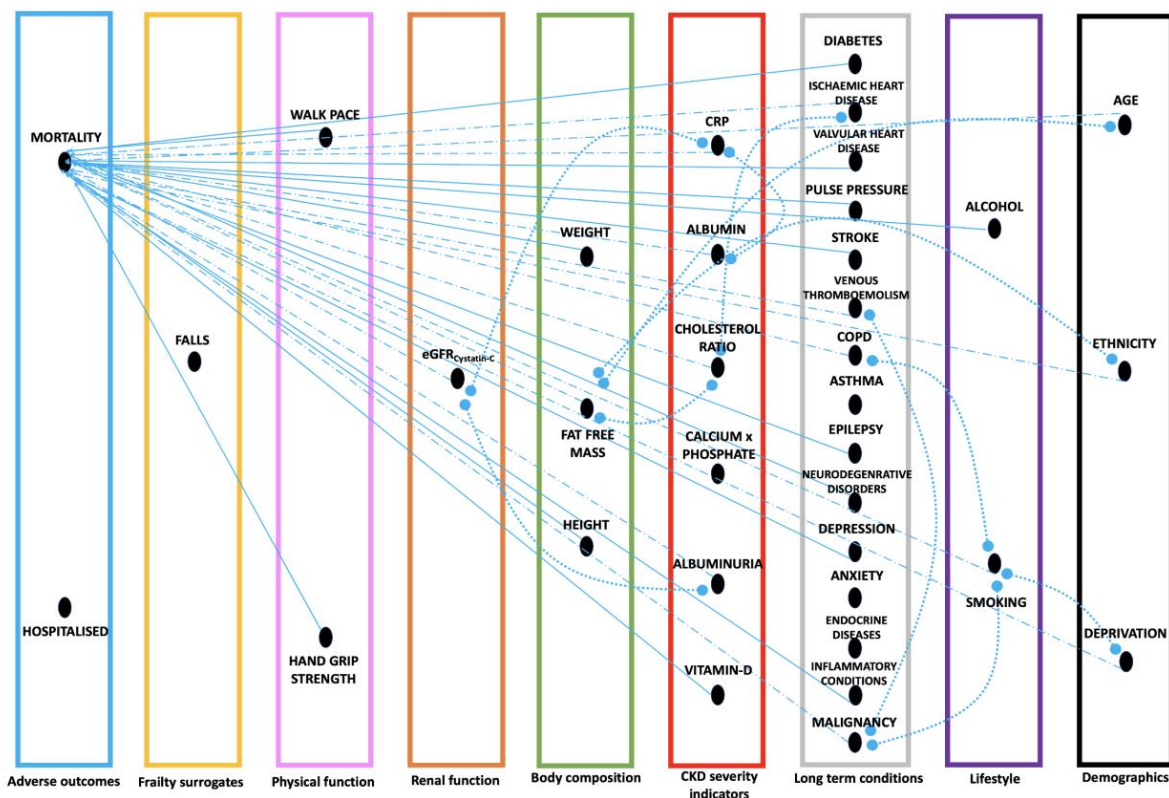
Figure 1: Factors directly associated with mortality using sequences of regressions analyses (SoRA) in females using the eGFR$_{Cystatin-C}$ submodel. Mortality in this model is seen as a response variable to variables to the right on the graph. Direct associations without interaction are depicted as straight lines (continuous line) with the arrow pointing towards mortality. Direct associations with interactions present are depicted as straight lines (dotted-hyphenated line) with the arrow pointing towards mortality. Interaction terms within the final model are depicted as curved lines (dotted), adjoining the two variables involved in the interaction term.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

This project was approved by the UK Biobank (Approved Research ID 70918).

Poster number: 226

Submission number: 358

DYNAMic renal assessment: NOvel methods to assess KIDNEY functional reserve (DYNAMO KIDNEY)

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Miss Amrita Ramnarine

Biography
Renal Registrar ST6 Research Fellow Kings Hospital

Abstract

Introduction:

Chronic Kidney Disease (CKD) affects approximately 11% of the population with substantial healthcare costs.1 Early CKD identification is needed but Glomerular Filtration Rate (GFR) calculation using serum creatinine is suboptimal and only increases when >50% of kidney mass is lost.2 Patients with reduced nephron number including those with a single kidney may be 'hyper-filtering' and have an inability of to respond to stressors, which has been demonstrated to predate CKD.3 'Renal Reserve' is defined as the difference between stimulated/stressed and baseline GFR but is impractical and costly to perform.

SGLT-2 inhibition has been shown to reduce GFR by 24% reduction in patients with hyperfiltration. 6 They have also been shown to reduce urinary concentrations of 'renal stress-response markers' including Interleukin-6;IL-6, Kidney-Injury-Molecule;KIM-1 and monocyte-chemoattractant-protein-1;MCP-1. 7 We hypothesise that 'SGLT2-i inverse-stress-test' can be used as a novel cheaper method of measuring renal reserve. We will compare the SGLT2-i inverse-stress-test with gold-standard renal reserve using iohexol and protein loading in the following populations:

i.   Healthy controls (with and without high-risk APOL1 variants)

ii.   Previous Kidney donors

iii.   Recovered Acute-Kidney-Injury

Methods:

Inclusion criteria: >40 years old; 20-healthy controls (12-APOL1 low-risk/8-high risk); 12-recovered AKI and 12-previous kidney-donors. Exclusion criteria: Breastfeeding/Pregnant women. ACE-I will be stopped and a low-protein diet maintained for 2 days prior to the study.

Day 1: Patients will have serum creatinine tested and overnight urinary biomarkers collected. Cimetidine (1200mg) will be administered with subsequent urine and venous Cr collection at 3&6 hours. Creatine Clearance with inhibition of tubular creatinine can then be calculated and used as a surrogate for iohexol-derived GFR if within 10% of iohexol values.

GFR will be measured using iohexol testing by injecting 5ml of iohexol intravenously and then taking samples at 5min, 120min,160min and 180 min for GFR calculation.

Day 2: Patients will have an oral protein load-1g/kg and stressed GFR measured 2hrs later using iohexol testing as above. The difference between pre and post protein-loading iohexol-derived-GFR will be 'gold-standard renal reserve'.

Day 3-16: Dapagliflozin 10mg will be prescribed for 14days.

Day 17: Patients will have an iohexol test to assess GFR change post-dapagliflozin and overnight urinary stress biomarkers sample collected.

The change between urinary stress markers, serum Cr and iohexol-measured GFR pre and post SGLT2i administration will be established and compared with gold-standard renal reserve. Continuous data will be reported as mean +/-SD for normal data and median/IQR for non-normal data. GFR change will be compared between the different groups using analysis of variance. A 2-group t-test, with a 2-sided significance level of 0.05 and a sample size of 12 subjects per group, would provide 80% power to detect a mean difference in GFR of 6 mL/min/1.73m2.

Results/ Discussion:

The findings of this study will inform future validation work for the role of a simple renal 'stress test' using SGLT-2 and urinary stress markers to identify people with preserved renal function at greatest risk of AKI and/or CKD.

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Poster number: 227

Submission number 363

Severity of Renal Dysfunction and Response to Ferric Derisomaltose in Heart Failure in the IRONMAN RCT

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Dr Fozia Ahmed

Biography
Fozia Ahmed graduated from the University of Manchester in 2003 and undertook specialist in cardiology in the North-West region. In 2015 she was appointed as a Consultant Cardiologist at Manchester University Hospitals, where she specialises in heart failure and cardiac devices. She is Honorary Reader in Cardiovascular Sciences at University of Manchester and NIHR specialty co-lead for Cardiovascular Research in Greater Manchester. Her research interests broadly span the themes of remote monitoring and management of heart failure, risk prediction models, and prevention of cardiovascular infection; with a focus on practice-based clinical trials and re-designing pathways to improve patient outcomes.

Abstract

Introduction:

People with heart failure (HF) and chronic kidney disease (CKD) often have anaemia and iron deficiency (ID) and might respond differently to administration of intravenous iron. We conducted a subgroup analysis of participants enrolled in the IRONMAN trial, stratified by severity of CKD, to examine the impact of ferric derisomaltose (FDI) on outcomes.

Methods:

IRONMAN was a prospective, randomised, open-label trial that randomly assigned patients with HF, LVEF <45% and iron deficiency, (transferrin saturation (TSAT) <20% or ferritin <100μg/L) to receive either IV FDI (n=569) or usual care (n=568). Patients in the FDI arm were re-dosed with IV iron every 4 months unless ferritin was >400μg/L or TSAT $\geq$25%. The current analysis stratified patients according to baseline estimated glomerular filtration rate (eGFR).

Results:

Of 1,137 patients randomised, eGFR was <30 ml/min/1.73m^2 in 121 (11%) patients, 30-<45 ml/min/1.73m^2 in 314 (28%), 45-<60 ml/min/1.73m^2 in 295 (26%), and >60 ml/min/1.73m^2 in 407 (36%). Compared to patients with eGFR >60 ml/min/1.73m^2, those with eGFR <30 ml/min/1.73m^2 were older, had worse NYHA class, were more often enrolled in hospital, were more likely to have hypertension, diabetes, atrial fibrillation and anaemia, had lower haemoglobin (Hb) (11.5 vs. 12.4 g/l) and higher plasma concentrations of NT-proBNP. Despite increasing severity of anaemia with lower eGFR, TSAT% remained constant across the eGFR spectrum, but serum ferritin concentrations were higher when eGFR was <30 ml/min/1.73m^2 (Table 1). Among patients randomised to FDI, quality of life scores (Minnesota Living with Heart Failure) improved substantially in those with an eGFR <45 compared to ≥45 ml/min/1.73m^2. Compared to other groups, patients with an eGFR <30 ml/min/1.73m^2 had a higher mortality, which was reduced substantially in those randomised to FDI (CV mortality; HR (95% CI) 0.51 (0.29,0.90); all-cause mortality; HR 0.53 (0.32,0.87) (Table 2).

Conclusion:

Among patients with HF and ID, those with eGFR <30 ml/min/1.73m^2 are more symptomatic and have worse outcomes, which both improve substantially after administration of FDI. However, the subgroup is small. The play of chance or imbalances in baseline characteristics might account for these observations. Analysis of other randomised trials may confirm or refute these findings.

Table 1: Baseline characteristics split by severity of CKD. Continuous variables are summarised as median (lower quartile, upper quartile) and categorical variables as counts and percentages. NT-proBNP was recorded only in a subset of ambulatory patients.

	eGFR <30 (n=121)	eGFR ≥30 and <45 (n=314)	eGFR ≥45 and <60 (n=295)	eGFR ≥60 (n=407)	P
Randomised to FDI	52 (43)	159 (51)	152 (52)	206 (51)	-
Age (years)	77 (72, 82)	76 (71, 81)	74 (68, 80)	69 (61, 76)	<0.001
Women	26 (21)	82 (26)	83 (28)	109 (27)	0.58
Hist. of Hypertension	76 (63)	187 (60)	154 (52)	195 (48)	0.003
Hist. of Diabetes	61 (50)	157 (50)	142 (48)	161 (40)	0.016
Hist. of AF	67 (55)	163 (52)	146 (49)	158 (39)	<0.001
Ischaemic aetiology	74 (61)	177 (56)	174 (59)	222 (55)	0.50
Recruited:					
In hospital	36 (30)	44 (14)	36 (12)	48 (12)	<0.001
Recent discharge	26 (21)	65 (21)	47 (16)	70 (17)	
Ambulatory patient	59 (49)	205 (65)	212 (72)	289 (71)	
NYHA II	42 (35)	157 (50)	182 (62)	267 (66)	<0.001
NT-proBNP (ng/L)	5034 (2223, 9000) N=44	2160 (1091, 3966) N=158	1644 (959, 3523) N=161	1171 (575, 2437) N=202	<0.001
LVEF (%)	30 (23, 36)	34 (25, 39)	35 (27, 38)	33 (26, 36)	0.051
SBP (mmHg)	117 (106, 129)	121 (108, 134)	119 (105, 133)	118 (105, 132)	0.21
Hb (g/dL)	11.5 (10.7, 12.4)	12.0 (11.0, 12.8)	12.0 (11.1, 12.9)	12.4 (11.5, 13.0)	<0.001
Anaemia					
None	19 (16)	95 (30)	94 (32)	158 (39)	<0.001
Mild	36 (30)	93 (30)	86 (29)	133 (33)	
Moderate	66 (55)	125 (40)	115 (39)	116 (29)	
TSAT (%)	14 (10, 19)	16 (12, 19)	15 (11, 20)	15 (10, 20)	0.48
TSAT <20%	91 (79)	237 (76)	217 (75)	296 (75)	0.77
Ferritin (ng/mL)	58 (41, 98)	55 (34, 96)	47 (30, 83)	44 (25, 78)	<0.001

Table 2: Change in haemoglobin, QoL indicators and outcomes, split by severity of CKD.

Mean(SD) for Hb baseline, month 4 and change from baseline at month 4, split by severity of CKD and treatment arm, with 95% CI for differences between treatment arms in change from baseline and test for treatment by CKD stage interaction in changes from baseline.

Mean (SD) for MLWHF scores at month 4, 95% CIs for differences between treatment arms within CKD stage and test for interaction.

Outcomes data (hospitalisation, mortality and infection endpoints) stratified by severity of CKD, 95% CIs for differences between treatment arms within CKD stage and test for interaction.

	eGFR<30		eGFR ≥30 and <45		eGFR ≥45 and <60		eGFR ≥60		P for interaction
	FDI	UC	FDI	UC	FDI	UC	FDI	UC	
Evaluation at 4 months	52	69	159	155	152	143	206	201	
Change in Hb from baseline. (mean ± SD)	0.7±1.37	0.3±1.13	0.7±1.19	0.1±1.13	0.7±1.26	0.4±1.27	1.0±1.49	0.1±1.21	0.093
Difference in MLwHF at 4 months (mean; 95% CI)	-8 (-20 to +4) negative score = FDI better		-10 (-16 to -4) negative score = FDI better		-2 (-8 to +5) no meaningful difference		+2 (-3 to +8) no meaningful difference		0.032
Primary Endpoint (recurrent)									
n, Rate/100 patient-years	36 (32)	83 (70)	128 (32)	130 (35)	84 (20)	105 (26)	88 (15)	93 (16)	
Rate Ratio (95% CI)	0.49 (0.31, 0.76)		0.94 (0.64, 1.36)		0.79 (0.51, 1.22)		0.98 (0.62, 1.54)		0.16
Primary endpoint (first)									
n (%)	26 (50)	49 (71)	71 (45)	74 (48)	51 (36)	55 (38)	50 (24)	53 (26)	
Hazard Ratio (95% CI)	0.59 (0.36, 0.96)		0.87 (0.63, 1.20)		0.92 (0.63, 1.35)		0.96 (0.65, 1.41)		0.45
CV death									
n (%)	18 (35)	37 (54)	45 (28)	43 (28)	29 (19)	31 (22)	27 (13)	27 (13)	
Hazard Ratio (95% CI)	0.51 (0.29, 0.90)		0.99 (0.65, 1.51)		0.92 (0.56, 1.54)		1.05 (0.61, 1.79)		0.23
All-cause death									
n (%)	24 (46)	48 (70)	66 (42)	60 (39)	50 (33)	41 (29)	44 (21)	44 (22)	
Hazard Ratio (95% CI)	0.53 (0.32,0.87)		1.05 (0.74, 1.49)		1.20 (0.79, 1.81)		1.04 (0.69, 1.58)		0.059
All-Cause hosp.									
n (%)	37 (71)	55 (80)	117 (74)	111 (72)	92 (61)	96 (67)	105 (51)	108 (54)	
Hazard Ratio (95% CI)	0.73 (0.47, 1.13)		0.92 (0.71, 1.19)		0.89 (0.67, 1.19)		0.96 (0.74, 1.26)		0.58
CV hosp.									
n (%)	29 (56)	44 (64)	84 (53)	87 (56)	59 (39)	75 (52)	82 (40)	67 (33)	
Hazard Ratio (95% CI)	0.73 (0.45, 1.18)		0.85 (0.63, 1.15)		0.72 (0.51, 1.01)		1.24 (0.91, 1.73)		0.076
Infection hosp.									
n (%)	8 (15)	25 (36)	44 (28)	38 (25)	27 (18)	41 (29)	32 (16)	36 (18)	
Hazard Ratio (95% CI)	0.31 (0.14, 0.71)		1.08 (0.70, 1.67)		0.61 (0.37, 0.99)		0.89 (0.55, 1.43)		0.012

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cite

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Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

ClinicalTrials.gov, NCT02642562

Poster number: 228

Submission number: 132

Assessing estimated glomerular filtration rate (GFR) equation performance compared to measured-GFR stratified for ethnicity and albumin: AIM CKD UK study development – analysis of 2623 patients

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Dr Rouvick Mariano Gama

Biography
I am a renal registrar working in South London. I have previously published work assessing ethnicity-based disparities in acute kidney injury in pregnancy and kidney function measurements with and without ethnicity coefficients. This has informed my PhD, which is supported by Kidney Research UK, assessing ethnicity-related disparities in the performance of GFR equations and reducing health inequalities through accurate and novel assessment of kidney function.

Abstract

<u>Introduction</u>

Accurate measurement of kidney function using estimated glomerular filtration rate (eGFR) is essential for appropriate risk stratification of cardiovascular events, kidney failure and prescribing of cardiorenal protective and other medications.

The AIM CKD UK study (IRAS 320215) will assess the accuracy of current and novel creatinine-based eGFR equations compared to exogenous filtration marker derived measured GFR (mGFR) for people of different ethnicities in large national cohort.

We performed a preliminary analysis from a single centre in AIM CKD UK to inform future data collection and assessed:

1. Accuracy of different eGFR equations compared to measured GFR (mGFR) in a single centre
2. Assessment of bias between mGFR and eGFR for paired tests within 7 days compared to 8-30 days.
3. Impact of serum albumin concentration on association between mGFR and eGFR.

Methods

All adults (≥18-years) who had paired mGFR and eGFR tests within 30 days between 2009-2022 were included. Patients with mGFR ≥150ml/min/1.73m^2, incomplete datasets and previous amputations were excluded.

Age, reported ethnicity, biological sex, referral specialty, height, weight, exogenous filtration marker and creatinine and albumin assays were recorded. eGFR was calculated from creatinine, age and sex using five equations (Figure 1).

Each eGFR equation was compared to mGFR using median bias, precision, 30% accuracy (P30). Agreement was demonstrated with Bland-Altman plots. Results were stratified for time between eGFR-mGFR (≤7 days vs 8-30 days) and albumin concentration; low (<35 g/L) vs normal / high (≥35 g/L). Assessment of equation performance in different ethnicity was underpowered in this interim analysis and therefore not stratified. Data were analysed using software R V4.2.2.

Results

There were 2623 patients included. Mean age was was 54.8 ± 13.1 years, with 57.8% male (N=1515). The majority of patients were White ethnicity (58.7%; N=1539). Median mGFR was 77 mL/min/1.73m^2 (IQR 62 – 91 mL/min/1.73m^2). Median serum creatinine concentration was 74 umol/L (IQR 61 – 90 umol/L). The CKD-EPI 2009 equation, compared to mGFR, demonstrated a median bias of +12.8 mL/min/1.73m^2, percentage bias of 16.9% and P30 of 68.6%. The Lund-Malmo revised equation performed best with median bias of 2.1 mL/min/1.73m^2 (percentage bias 2.9%) and a P30 of 82.7%. Agreement, with ethnicity stratification is summarised in Table 1.

The majority of patients (N=2439; 93.0%) had paired mGFR-eGFR tests within 7-days. There was no significant difference between the median bias of each group (p=0.749). 2610 (99.5%) patients had concurrent albumin tests performed; 183 (7.0%) of these patients had low albumin concentrations. Median bias was significantly higher in this group compared to normal/high albumin for each equation (e.g. Low vs Normal/high albumin median bias for CKD-EPI equation = 20.3 vs 12.5mL/min/1.73m^2; p<0.001).

Discussion

The LM revised and European Kidney Function Consortium equations perform best in this cohort. Limitations include selection bias and retrospective data.

Future data analysis for the AIM CKD study can include paired samples within 30 days as there is no significant difference between 0-7 and 8-30 days. The impact of serum albumin on mGFR-eGFR association in a larger cohort stratified for confounding variables, such as liver disease, malignancy and body mass index is required.

Figure 1. Summary of the creatinine-based eGFR equations used. All equations were used with ethnicity coefficients.

Abbreviation of GFR Equation	Year	GFR Equation Formula
MDRD	1999	$175 \times$ standardized $S_{Cr}^{-1.154} \times age^{-0.203} \times 1.210$ [if black] $\times 0.742$ [if female]
CKD-EPI	2009	$141 \times \min(S_{Cr}/\kappa, 1)^{\alpha} \times \max(S_{Cr}/\kappa, 1)^{-1.209} \times 0.993^{Age} \times 1.159$ [if Black] $\times 1.018$ [if female]
CKD-EPI (ethnicity-neutral)	2021	$142 \times \min(S_{Cr}/\kappa, 1)^{\alpha} \times \max(S_{Cr}/\kappa, 1)^{-1.200} \times 0.994^{Age} \times 1.012$ [if female]
Revised Lund-Malmo	2011	$e^{X-0.0158 \times Age + 0.438 \times \ln(Age)}$
EKFC	2021	Age SCr/Q Equation 2-40y <1 $107.3 \times (SCr/Q)^{-0.322}$ 2-40y ≥1 $107.3 \times (SCr/Q)^{-1.132}$ >40y ≥1 $107.3 \times (SCr/Q)^{-0.322} \times 0.990^{(Age-40)}$ >40y ≥1 $107.3 \times (SCr/Q)^{-1.132} \times 0.990^{(Age-40)}$

Table 1. Compares eGFR equations to mGFR assessing bias, precision, accuracy and agreement for the single-centre cohort. Results are stratified for ethnicity (grouped as White, Black and South Asian). Mean and median mGFR and eGFR is also included.

	Median Bias	IQR Bias	Mean Bias	Upper 95% LoA	Lower 95% LoA	SEM Bias	% Bias	IQR % Bias	P30
All Patients (N=2623):									
MDRD	8.6	25.2	11.0	56.9	-34.9	0.5	11.7	36.6	70.5
CKD-EPI 2009	12.8	22.8	13.6	47.2	-20.1	0.3	16.9	32.4	68.6
CKD-EPI 2021	14.2	21.0	14.2	45.7	-17.3	0.3	18.9	30.8	66.6
EKFC	6.1	19.8	6.5	36.3	-23.3	0.3	8.5	28.3	80.4
LM Revised	2.1	20.2	2.0	33.8	-29.8	0.3	2.9	27.9	82.7
White Ethnicity (N=1539):									
MDRD	10.3	24.2	12.9	55.4	-29.7	0.6	14.5	35.7	69.5
CKD-EPI 2009	13.8	21.8	14.4	45.7	-17.0	0.4	17.9	31.2	68.0
CKD-EPI 2021	15.9	19.7	15.8	44.7	-13.1	0.4	21.3	30.0	64.4
EKFC	7.6	18.3	7.7	35.4	-20.0	0.4	9.9	27.0	80.6
LM Revised	3.3	19.0	3.7	32.7	-25.3	0.4	4.7	26.8	84.2
Black Ethnicity (N=185)*:									
MDRD	1.5	26.9	2.8	46.9	-41.3	1.7	1.9	39.7	73.0
CKD-EPI 2009	8.1	26.8	9.2	50.0	-31.5	1.5	11.2	40.5	68.1
CKD-EPI 2021	9.1	27.0	9.6	49.2	-30.1	1.5	14.2	36.2	68.1
EKFC	3.5	21.5	3.7	40.2	-32.9	1.4	5.5	33.2	77.3
LM Revised	-1.2	20.9	-1.4	35.6	-38.4	1.4	-1.6	30.6	75.1
South Asian Ethnicity (N=91)*:									
MDRD	15.2	24.9	16.1	56.0	-23.8	2.1	23.9	34.8	59.3
CKD-EPI 2009	20.4	22.8	18.3	52.6	-16.0	1.8	28.7	35.5	50.5
CKD-EPI 2021	21.2	24.6	18.6	50.5	-13.3	1.7	28.7	35.4	50.5
EKFC	14.3	20.9	11.3	41.8	-19.0	1.6	20.1	33.2	63.7
LM Revised	9.7	19.0	6.9	36.7	-22.8	1.6	13.1	29.1	74.7

*Underpowered in this analysis.

Abbreviations: MDRD = Modification of Diet in Renal Disease; CKD-EPI = Chronic kidney disease Epidemiology Collaboration; EKFC = European Kidney Function Consortium; LM = Lund-Malmo. IQR; LoA = Limits of Agreement; SEM = Standard error of the mean; IQR = interquartile range; P30 = Proportion of eGFR results within 30% of corresponding measured GFR.

References (if any)

Poster number: 229

Submission number: 368

A regional review of optimal management of patients seen in chronic kidney disease clinic

Dr Daniel Kimber, Dr James Hartley, Dr Harsha Wodeyar

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Dr Daniel Kimber

Biography
Daniel Kimber is a SHO-grade doctor currently working at the Royal Liverpool University Hospital. He received his medical degree with honours from the University of Leicester. His current research interests include the early identification, prevention and management of chronic kidney disease.

Abstract

Introduction: The current NICE CKD guidelines state that one of the criteria for which adult patients should be referred for specialist assessment is a 5-year risk of end-stage kidney disease greater than 5%, as calculated by the Kidney Failure Risk Equation (KFRE). They also advise for close monitoring and control of blood pressure (BP), alongside maximal up-titration of renin-angiotensin-aldosterone blockers, plus introduction of evidence-based beneficial medications such as sodium glucose cotransporter-2 inhibitors (SGLT2i) and statins.

This audit aimed to review current practices across the Liverpool University Hospitals Foundation Trust (LUHFT) site to ascertain whether care is in line with this current guidance.

Methods: A retrospective data analysis was carried out on a random sample of 100 patients seen in General Nephrology clinic in January 2023. Patients were excluded if they were on dialysis, had glomerulonephritis and were currently on immunosuppressive medications, had Adult Polycystic Kidney Disease or renal-tubular pathology. Data was obtained from patient notes, clinic letters and primary care records. Data variables gathered included patients' ages, eGFR, urinary albumin-creatinine ratio (uACR), BP, list of current medications and dates that those medications were commenced.

Results: The sample consisted of 51 males and 49 females, with a median age of 68. Of the 81 patients with an available uACR, 59.3% had a KFRE value of ≤5%. The median KFRE of all patients was 3.65%. 81% of patients in total had stable kidney function over the preceding 12 months.

78% of patients had their BP recorded and documented in clinic. Of those, 59% had optimal control. 13% of patients were established on a maximal dose of an angiotensin-converting enzyme inhibitor or angiotensin receptor blocker, despite 47% of this cohort having suboptimal BP control.

64 patients met at least one criterion for initiation of an SGLT2i, yet only 17% had been started on one. Similarly, only 71% of patients recommended a statin had one prescribed.

7 months after the clinic dates, 22% of medications recommended to be started in clinic weren't commenced in primary care. The median time between the clinic date and the prescription of a medication in the community was 22 days. The median time for a dose increase was 43 days.

Discussion: The audit data indicates that a large proportion of patients observed in clinic can be effectively managed in primary care owing to their low KFREs and stable renal function. Furthermore, there is a notable delay in optimising medications for patients. To witness meaningful change, a paradigm shift in the pathway is necessary, rather than persisting with the same approaches.

The implemented pathway changes, complemented by the utilisation of KFRE for risk-stratified referrals, encompass a pharmacist-led medicines optimisation clinic. Diverging from the traditional method of review and correspondence via letters to the general practitioner, the revised pathway guarantees that patients are optimized on all evidence-based treatments in a pharmacist-led, protocol-driven medication optimisation clinic. Assessing the suitability of continuous monitoring of patients in secondary care, once initiated on evidence-based treatment, will also adopt a risk-based approach, considering the patients' KFRE.

References

https://www.nice.org.uk/guidance/ng203

Poster number: 230

Submission number 398

Long term outcomes in people with fluctuating criteria for the diagnosis of chronic kidney disease

<u>Prof Maarten Taal</u>[1,2], Dr Bethany Lucas[1,2], Dr Natasha McIntyre[3], Prof Chris McIntyre[3], Dr Richard Fluck[2]

[1]Centre for Kidney Research and Innovation, University of Nottingham. [2]Department of Renal Medicine, Royal Derby Hospital. [3]University of Western Ontario, Canada

Prof Maarten Taal

Biography

Maarten Taal trained at the University of Cape Town, South Africa and undertook a period of laboratory research at Brigham and Women's Hospital, Boston, USA under the directorship of Barry M. Brenner, MD. He is Professor of Medicine at the University of Nottingham and Honorary Consultant Nephrologist at Royal Derby Hospital. He has a career-long interest in chronic kidney disease and kidney replacement therapies. Maarten serves as Co-Editor for "Brenner and Rector's The Kidney", Section Editor for "Current Opinions in Nephrology and Hypertension" and Academic Editor for "PLOS Medicine". He is a Past President of the British Renal Society and current Chair of the International Network of CKD Cohorts.

Abstract

Introduction: The diagnostic criteria for chronic kidney disease (CKD) recognise that measures of kidney function may fluctuate in the short term by requiring that abnormalities must persist for at least 90 days to support the diagnosis. Nevertheless, studies have reported that even people who meet the diagnostic criteria may have transient or prolonged improvement in kidney function in the absence of specific treatment. In this study we used the opportunity afforded by long term follow-up of a cohort recruited from primary care to assess the impact on outcomes of fluctuations in CKD diagnostic criteria.

Methods: Participants with confirmed CKD stage 3 were recruited from primary care practices in 2008-2010. Clinical assessment and protocol laboratory tests were performed at baseline, 1 and 5 year study visits. In 2019-20, information on deaths and latest available outpatient estimated GFR (eGFR) and urine albumin to creatinine ratio (UACR) values was obtained from electronic records. Participants with eGFR≥60ml/min/1.73m^2 and UACR<3mg/mmol were regarded as being in "remission" at each time point. CKD progression was defined as a decline in eGFR of ≥25% and progression to a more advanced stage (KDIGO definition).

Results: The cohort included 1741 participants with median (IQR) age 74 (67-79) years, eGFR 53.8 (45.3-61.7) ml/min/1.73m^2 and UACR 0.3 (0.001-1.5) mg/mmol at baseline. During a median observation period of 9.8 (9.2-10.0) years, 680 participants (39.1%) died and CKD progression was observed in 430 of 1402 (30.6%) but only 24 (1.4%) progressed to CKD stage 5. The prevalence of remission was 495/1737 (28.5%) at baseline, 424/1618 (26.2%) at year 1, 335/1236 (27.1%) at year 5 and 176/1190 (14.8%) at year 10. Remission was present at all three visits in 15.4%, two visits in 13.0% and one visit in 15.8%. Participants with diabetes and those treated with a renin-angiotension system inhibitor evidenced a lower prevalence of remission at all time points. Blood pressure control to <130/80mmHg was not associated with remission. Evidence of remission at 1, 2 or 3 study visits was associated with progressively lower incidence of persistent CKD, CKD progression and death at 10 years (Table, p<0.001 for all trends). No participants with an episode of remission had progressed to CKD stage 5 at 10 years.

Table: Outcomes after 10 years, stratified by the number of episodes of CKD remission observed at study visits at baseline, year 1 and year 5.

Episodes of remission	Outcomes after 10 years		
	CKD	CKD Progression	Death
0	577/605 (95.4%)	250/683 (36.6%)	229/687 (33.3%)
1	140/164 (85.4%)	48/188 (25.5%)	37/194 (19.1%)
2	108/138 (78.3%)	46/159 (28.9%)	23/160 (14.4%)
3	80/158 (50.6%)	30/186 (16.1%)	16/189 (8.5%)

P<0.001 for all trends

Conclusions: A substantial minority of people diagnosed with CKD in primary care exhibit fluctuating diagnostic criteria. People with one or more episodes of remission appear to have a better prognosis than those with persistent CKD but remain at risk of CKD progression. They can therefore be reassured that an episode of remission is associated with an improved prognosis but long-term monitoring of kidney function is still warranted.

Poster number: 231

Submission number: 624

ACEi/ARB usage in Paediatric CKD in a national centre: room for improvement?

Mr Nicolas Martinez Curbera[1], Dr Ben Reynolds[2]

[1]RHC Glasgow, Glasgow. [2]University of Glasgow, Glasgow

Mr Nicolas Martinez Curbera

Biography
Final year medical student at the University of Glasgow

Abstract

The use of angiotensin converting enzyme inhibition or angiotensin receptor blockade (ACEi/ARB) to reduce proteinuria in patients with chronic kidney disease (CKD) has proven efficacy in adults in reducing progression to kidney failure(1). The impact of ACEi/ARB in pediatric ckd is similar, corroborated by large cohorts (2,3). Despite this, ongoing registry data and baseline data in studies suggests there is a reluctance to start these medications. We audited our CKD population over a decade, to determine the proportion on ACEi/ARB or intolerance. A secondary outcome was the rate of estimated GFR(eGFR) decline for those on and off ACEi/ARB.

Methods All patients with eGFR<60ml/min/1.73m^2 on 2 occasions at least 3 months apart were identified using a database from 01/2013 to 03/2024. Data were collected on ACEi/ARB starting and stopping, reason for discontinuation, median protein:creatinine ratio (PCR) 6 monthly, eGFR 6 monthly. Data were collected until patients transplanted or the end of the collection period.

Results From 276 patients, 181 were excluded leaving 76 eligible patients, 32 (42%) were on an ACEi/ARB at the time of data collection. 37 (49%) never received an ACEi/ARB. 7 discontinued ACEi/ARB: 2 due to hypotension, 1 due to hyperkalaemia, 1 due to rise in creatinine, 1 was deemed to no longer require it due to low proteinuria and adequate blood pressure, and 2 had no reason documented.

Average PCR for patients on ACEi/ARB was 90mg/mmol creatinine and 122 in patients not on. Average rate of GFR decline was 0.5ml/min/1.73m^2/year for patients on ACEi/ARB and 1.1 for patients not on.

Conclusions Despite evidence of potential benefit, nearly half of CKD patients in our institution were not on ACEi/ARB. Though reasons for discontinuing ACEi/ARB were often given, rationale for not starting was poorly documented.

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Poster number: 232

Submission number: 146

Cyclophosphamide, steroids, and mycophenolate mofetil for rapidly progressive IgA nephropathy - a case report.

Dr Gavin Esson[1], Dr Mawahib Ahmed[2], Dr Amro Hafez[1], Dr Alvin Karangizi[3]

[1]health education north east england, Newcastle. [2]Health education north east england, Newcastle. [3]north cumbria integrated care, Carisle

Dr Gavin Esson

Biography
Renal Trainee in Newcastle.

Abstract

IgA nephropathy (IgAN) is the most common primary glomerular disease worldwide. It rarely presents with rapid progression requiring haemodialysis. Current guidelines advise managing these cases in accordance with guidelines for ANCA vasculitis - however the evidence is limited and clinical decision have to be balanced with treatment toxicity.

We present a case of a 39 year old male, with a past history of alcoholic liver disease and pyschosis, who presented with rapidly progressive IgAN requiring dialysis on presentation. He was initially treated with intravenous steroids and pulsed cyclophosphamide, followed by a tapering course of oral steroids and oral mycophenolate mofetil. His initial treatment was complicated by attempted suicide via removal of his temporary dialysis catheter, possibly related to steroid induced psychosis, as well as recurrent massive ascites.

Six months following treatment, he showed evidence of renal recovery, and he was successfully weaned off dialysis and has recovered renal function.

Poster number: 233

Submission number: 150

Real-world experience comparing avacopan use to high dose steroids as part of remission induction therapy in ANCA-associated vasculitis

Dr Catherine King[1], Dr Charlotte Talbot[1], Mrs Gemma Saeed[2], Mrs Alison Moore[3], Dr Benjamin Rhodes[4], Miss Lisha McCelland[5], Professor Lorraine Harper[6], Dr Dimitrios Chanouzas[1,3]

[1]Institute of Immunology and Immunotherapy, University of Birmingham. [2]Renal department, University Hospitals Birmingham. [3]Renal unit, University Hospitals Birmingham. [4]Department of Rheumatology, University Hospitals Birmingham. [5]Department of ENT surgery, University Hospitals Birmingham. [6]Institute of applied health research, University of Birmingham

Dr Catherine King

Biography
I am a nephrology registrar exploring my specialist interest in vasculitis during my PhD at University Hospitals Birmingham. My PhD project is looking at Cytomegalovirus reactivation in patients with active ANCA-associated vasculitis and its impact on clinical outcomes and I am current funded by a Medical Research Council clinical research training fellowship. I have set up a vasculitis patient advisory group to inform ongoing vasculitis research within my trust. I am also a member of the UKIVas education group, helping to arrange national training courses and regular training content.

Abstract

Introduction:

Avacopan, an oral complement C5a receptor antagonist, has been demonstrated to be as effective as tapering glucocorticoids, alongside Rituximab (RTX) or Cyclophosphamide (CYC), at inducing remission in ANCA-associated vasculitis (AAV). We describe our early experience of using Avacopan compared to high-dose glucocorticoids, alongside standard immunosuppression, in a tertiary vasculitis referral centre in the UK over the last 18 months.

Methods:

This retrospective analysis includes 60 patients with a new diagnosis or relapse of AAV over the last 18 months managed through our centre. Patients with eGFR < 15 ml/min at diagnosis were excluded as we do not currently use avacopan in those patients. Patients were treated with either, avacopan with or without low dose glucocorticoids, or standard high dose glucocorticoids, alongside RTX or CYC. We collected clinical and safety outcomes over a 26 week follow up period.

Results:

30 patients were treated with avacopan alongside RTX or CYC. 80% of these patients received a 2 week low-dose prednisolone course alongside avacopan. Our standard steroid protocol in avacopan treated patients is to administer 30mg prednisolone for 1 week, 20mg prednisolone for 1 week and then stop. 30 patients received standard high dose prednisolone alongside RTX or CYC and no avacopan. These patients were either diagnosed prior to NICE approval of avacopan or had a contraindication to commencing avacopan, including abnormal liver function tests (LFTs) or a diagnosis of eosinophilic granulomatosis with polyangiitis (n=2). The demographics of both groups were similar at presentation in respect to age, gender, ethnicity, organ involvement and MPO or PR3 positivity. No patients required dialysis treatment. eGFR at presentation was lower in avacopan treated patients at 47 mL/min (IQR 19-82), compared to 64 (25-90) in the no avacopan group, but this difference was not statistically significant. By the end of 26 weeks of follow up, 5 patients in the avacopan group had discontinued avacopan. Two patients discontinued avacopan due to side effects (abnormal liver function and GI upset). Three patients required transfer to high dose steroids due to persistent ENT disease. In the remaining patients, there was no difference between patients treated with avacopan versus patients treated with high dose steroids in terms of attainment of remission, eGFR (Figure 1), proteinuria or CRP by 26 weeks of follow up. There was also no difference in the change in eGFR from baseline between the two groups.

Figure 1: Median eGFR over 26 weeks follow up in those treated with avacopan or not:
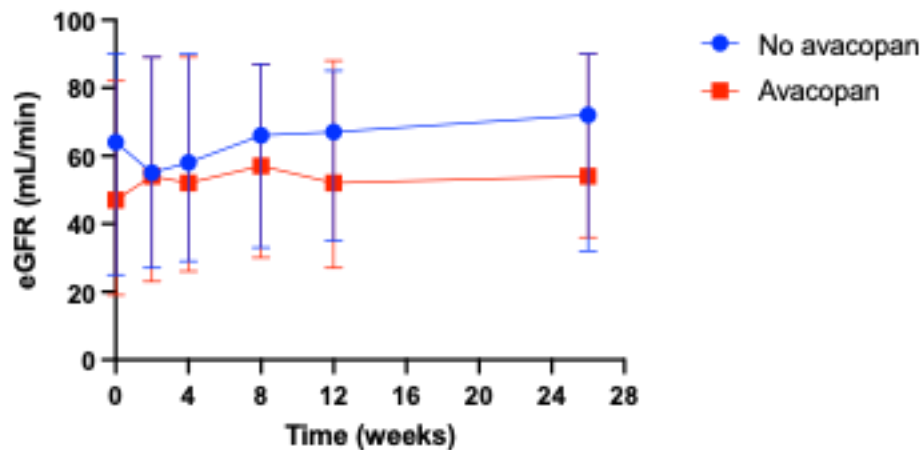
Discussion:

We report our real world experience of avacopan for the treatment of AAV with an eGFR > 15 ml/min in the context of minimal steroid use in the avacopan treated patients. Avacopan was discontinued in 5 out of 30 patients. Three out of those 5 patients required transfer to high dose steroids for persistent ENT disease. In the remainder of patients, avacopan with minimal steroid use was as efficacious as high dose steroids for the management of AAV.

Cytomegalovirus reactivation and renal damage in active ANCA-associated vasculitis

Dr Catherine King[1], Dr Alexander C Dowell[1], Dr Charlotte Talbot[1], Dr Kashif Eqbal[2], Professor Lorraine Harper[3], Dr Dimitrios Chanouzas[1,2]

[1]Institute of Immunology and Immunotherapy, University of Birmingham. [2]Renal unit, University Hospitals Birmingham. [3]Institute of Applied Health Research, University of Birmingham

Dr Catherine King

Biography
I am a nephrology registrar exploring my specialist interest in vasculitis during my PhD at University Hospitals Birmingham. My PhD project is looking at Cytomegalovirus reactivation in patients with active ANCA-associated vasculitis and its impact on clinical outcomes and I am current funded by a Medical Research Council clinical research training fellowship. I have set up a vasculitis patient advisory group to inform ongoing vasculitis research within my trust. I am also a member of the UKIVas education group, helping to arrange national training courses and regular training content.

Abstract

Introduction:

Cytomegalovirus (CMV) is a widely prevalent herpesvirus, present in over half the population by middle age. Following primary infection, CMV remains latent but can intermittently reactivate. We have previously shown that asymptomatic CMV reactivation occurs in 25% of CMV seropositive patients with ANCA-associated vasculitis (AAV) in remission, and that CMV specific immune signatures driven by CMV reactivation are associated with clinically important outcomes such as increased infection, increased arterial stiffness and reduced kidney function [1,2,3]

We hypothesised that asymptomatic CMV reactivation may amplify kidney damage in active AAV. To investigate this, we are undertaking a prospective observational study in newly diagnosed or relapsed AAV to determine the frequency of CMV reactivation in active AAV and its association with clinical outcomes and CMV driven immune signatures in peripheral blood and kidney tissue. We report here our findings of an interim analysis.

Methods:

Patients were recruited within 14 days of disease presentation. Quantitative CMV PCR of blood and urine samples was performed at baseline, fortnightly until month 1, monthly until month 6, then 3 monthly until month 12. Clinical data were collected at each visit. Peripheral blood mononuclear cells were collected at 3 monthly intervals and kidney tissue at diagnosis.

Results:

This analysis includes 47 CMV seropositive patients and 20 CMV seronegative patients followed up for a median duration of 198 days (IQR 99-308). There was no difference in renal involvement or degree of kidney injury between CMV seropositive and CMV seronegative patients. 49% of the CMV seropositive patients had evidence of asymptomatic CMV reactivation in blood or urine, with 96% occurring in the first 3 months. Those with CMV reactivation were more likely to have renal involvement (87 vs. 54%; p=0.014) and had significantly worse kidney function at baseline compared to those without CMV reactivation (median creatinine 277umol/L, IQR 185-564 vs. 99, IQR 79-219; p=0.002) [Figure 1]. Patients with CMV reactivation had more proteinuria compared to those with no reactivation (uACR 99.2 mg/mmol, IQR 33.5-325.3 vs. 42.2, IQR 3.8-232.7; p=0.023). Patients with evidence of CMV reactivation continued to have worse kidney function at 12 months [Figure 1]. A higher cumulative steroid burden at the time of recruitment was associated with CMV reactivation (p=0.004).

Figure 1: Longitudinal renal function following acute diagnosis of AAV according to CMV serostatus and reactivation:
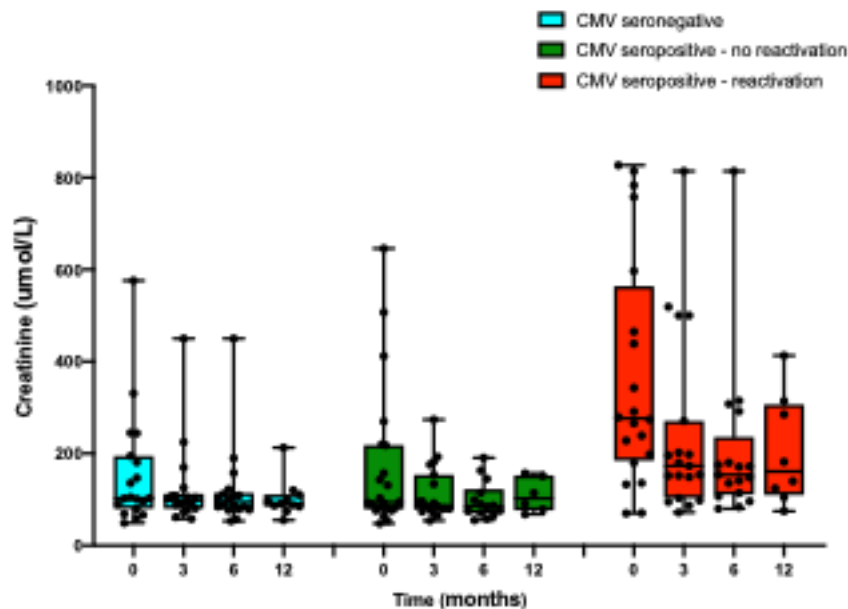
Discussion:

Asymptomatic CMV reactivation has occurred in half of CMV seropositive patients with acute AAV during the first 12 months and is associated with worse renal outcomes in these preliminary results. We are currently investigating the potential mechanisms whereby CMV infection may amplify kidney injury in AAV by assessing CMV driven immune signatures in peripheral blood and kidney tissue.

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Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

ClinicalTrials.gov ID: NCT04916704

Poster number: 235

Submission number: 175

Sparsentan (SPAR) as first-line treatment of incident patients with IgA nephropathy (IgAN): Findings from the SPARTAN trial

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Chee Kay Cheung

Biography
Dr. Chee Kay Cheung is a Consultant Nephrologist and Honorary Associate Professor, at the University Hospitals of Leicester, UK. His PhD examined factors that contribute towards progressive kidney damage in IgA nephropathy (IgAN), and current interests are in clinical trials in IgAN and glomerular diseases. He leads a number of investigator-initiated studies in this area in collaboration with pharmaceutical companies and academic partners, and has also served as UK national chief investigator and principal investigator on multiple clinical trials. He leads specialist clinics in glomerular diseases and in vasculitis and lupus nephritis. He is an active member of several national working groups, including the UK glomerular diseases clinical studies group and UK IgAN and membranous nephropathy rare diseases groups.

Abstract

Introduction: SPAR is a nonimmunosuppressive, dual endothelin and angiotensin receptor antagonist (DEARA) approved in the US for treatment of adults with IgAN. SPARTAN (NCT04663204) is an open-label, single-arm, multicenter, 110-wk, exploratory trial of SPAR in renin-angiotensin-aldosterone system inhibitor-naive patients newly diagnosed with IgAN. We report preliminary 48-wk safety and efficacy findings.

Methods: Patients ≥18 y with biopsy-proven IgAN, proteinuria of ≥0.5 g/d, estimated glomerular filtration rate (eGFR) of ≥30 mL/min/1.73 m2, and no previous treatment with angiotensin-converting enzyme inhibitors or angiotensin receptor blockers (≤12 mo) were eligible. Proteinuria, glomerular filtration rate, blood pressure (BP), body weight, total body water (bioimpedance), and safety were assessed.

Results: At data cutoff (9/26/2023), 12 patients (mean age, 36 [SD 12] y) received SPAR (≥1 dose) with up to 48 wk of follow-up. Proteinuria reductions were rapid (−62.6% from baseline to wk 4) and sustained over 48 wk (Figure); 67% of patients achieved complete remission of proteinuria (<0.3 g/d at

any time during treatment). After an initial decrease, BP remained stable during follow-up; eGFR, total body water, and body weight remained stable (Figure). One patient discontinued due to hypotension.

Discussion: SPAR was safe and generally well tolerated, with mean proteinuria reductions of >80% over 48 wk.

Geometric Mean Percent Change From Baseline in Proteinuria Over 48 Weeks
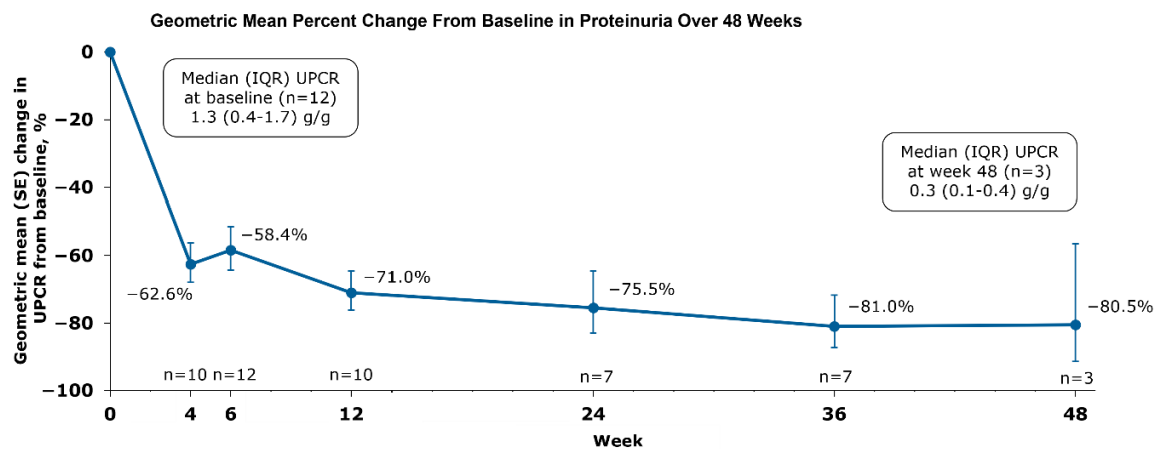
Summary Data Over 48 Weeks

Mean change from baseline (SD)	Week 2 (n=12)	Week 4 (n=11)	Week 6 (n=12)	Week 12 (n=10)	Week 24 (n=7)	Week 36 (n=7)	Week 48 (n=3)
SBP, mm Hg	−7 (7)	−13 (9)	−12 (8)	−13 (7)	−14 (6)	−12 (7)	−14 (4)
DBP, mm Hg	−7 (11)	−7 (8)	−7 (8)	−8 (7)	−10 (11)	−9 (9)	−12 (6)
eGFR, mL/min/1.73 m^2	1.1 (7.6)	−3.4 (6.5)	−1.3 (5.0)	1.4 (6.8)	−5.7 (7.2)	0.7 (11.6)	−1.3 (10.7)
Body weight, kg	−0.3 (0.7)	−0.2 (1.4)	0.3 (1.4)	0.1 (2.8)	−1.2 (3.2)	0.8 (3.0)	1.7 (4.9)
Total body water, L	–	–	−2.0 (7.2)	−1.9 (7.9)	−3.6 (9.1)	–	–

DBP, diastolic blood pressure; eGFR, estimate glomerular filtration rate; SBP, systolic blood pressure; UPCR, urine protein-to-creatinine ratio.

Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

NCT04663204

Poster number: 236

Submission number: 198

Selective disposition of voclosporin, cyclosporine, and tacrolimus in renal tissue

Dr Simon Zhou[1], Dr Krishani Kumari Rajanayake[2], Dr Miao He[2], Dr Bo Wen[2], Dr Ankhbayar Lkhagva[2], Dr Ernie Yap[1], Dr Duxin Sun[2], Dr Jennifer Cross[1], Dr Kory Engleke[1], Dr Robert Huizinga[3], Sadiq Amed[4]

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Dr Simon Zhou

Biography
Dr. Simon Zhou is currently the Vice President of Pharmacology and Pharmacometricst at Aurinia Pharma and is responsible for a group of clinical pharmacologists and pharmacometricians conducting clinical pharmacology and pharmacometric characterization of drug candidates from phase I to phase IV. He is experienced in development and implementation of overall clinical development strategy to profile clinical pharmacokinetics, biopharmaceutics, pharmacodynamics and exposure-response of drug candidates, design and analysis of clinical protocols, submission of INDs and NDAs and interaction with regulatory agencies around the globe. He has worked in preclinical and clinical drug development addressing clinical pharmacology, biopharmaceutical and trial design issues at hCelegne, hWyeth, Pfizer and Bristol-Myers Squibb. Dr. Zhou has received recognition and awards in Celgene, hWyeth, and Bristol-Myers Squibb for his work to advance drug candidates in clinical development and obtain regulatory approval of ABECMA®, BREYANZI®, ONUREG®, REBLOZYL®, INREBIC®, OTEZLA®, POMALYST® and IDHIFA®, expanded indications, patent extension and new formulations of Irbesartan, Fosinopril, Enbrel, Revelimid and Abraxane. He has published over 50 manuscripts in biopharmaceutics, drug delivery and pharmacokinetic and pharmacodynamic modelling. Dr. Zhou holds bachelor's and master's degrees in chemistry, a Ph.D. in Pharmaceutics and a Graduate Certificate on Modelling of Complex System from the University of Michigan.

Abstract

Background/Purpose

The calcineurin inhibitors (CNI) cyclosporine (CSA) and tacrolimus (TAC) were revolutionary when first introduced for solid organ transplant. Voclosporin (VCS), a novel CNI, is the first oral therapy approved for the treatment of active lupus nephritis. Unlike CSA and TAC, VCS has demonstrated consistent pharmacokinetics and pharmacodynamics, eliminating the need for therapeutic drug monitoring. Further, VCS is associated with a more favorable metabolic profile and has not been associated with electrolyte disturbances.

Emerging evidence indicates small molecule therapies display differential disposition within organ tissues. This suggests that CNIs may be differentially distributed and retained in the kidney, potentially

explaining differences in their efficacy and safety. Here we assessed in mice and humans the disposition of each CNI in the kidney relative to its systemic drug exposure.

Methods

Single 30 mg/kg doses of CSA, TAC and VCS were administered intravenously (IV) to mice. Following IV administration, kidneys were collected at various time points, flash frozen in liquid nitrogen, and stored at -20 °C. Sections of kidney tissue were mounted on indium tin oxide coated glass slides. Matrix of 10 mg/mL α-Cyano-4-hydroxycinnamic acid in 85% acetonitrile/13% ethanol + 2% water + 0.1% trifluoroacetic acid was sprayed on the tissue, dried for 10 minutes, and subjected to Matrix-assisted Laser Desorption and Ionization Mass Spectrometry Imaging (MALDI-MSI). The systemic and renal clearance (CLr) in humans of CSA and TAC were obtained from literature; pharmacokinetic data on VCS was obtained from data on file. Renal secretion of each drug was compared to its expected passive filtration based on glomerular filtration rate (GFR), fraction unbound in plasma (fu), and respective systemic drug exposure.

Results

MALDI-MSI demonstrated significantly higher concentrations of drug and more diffuse tissue disposition of CSA in mouse kidney compared to VCS (Figure 1). CSA was retained up to 2 hrs post-administration. Higher concentrations and more diffuse disposition of TAC was also noted compared to VCS at 15 and 30 min; TAC was distinctively retained in the cortex and medulla. VCS had moderate distribution in the cortex and was rapidly excreted with low levels present in the kidney after 1 hr.

According to published data, CSA has a measured renal CLr of 1.48 mL/min in humans, representing approximately 10% of expected passive filtration of 12.5 mL/min (Table 1). TAC has a CLr of 0.014 mL/min representing < 2% of expected passive filtration of 1.25 mL/min. VCS has a CLr of 7.82 mL/min representing approximately 200% of its expected passive filtration rate of 3.75 mL/min.

Conclusion

MALDI-MSI revealed differential retention and distribution of CSA, TAC and VCS in mice, consistent with their CLr in humans. Higher drug exposure and >90% renal reabsorption was observed for CSA and TAC, whereas renal handling of VCS suggested significant tubular secretion. The higher rate of secretion and lower overall renal exposure to VCS may be associated with improved safety when compared to the more diffuse distribution and greater renal retention of CSA and TAC.

Figure 1. MALDI-MSI of voclosporin, cyclosporine A, and tacrolimus in mouse kidney over time
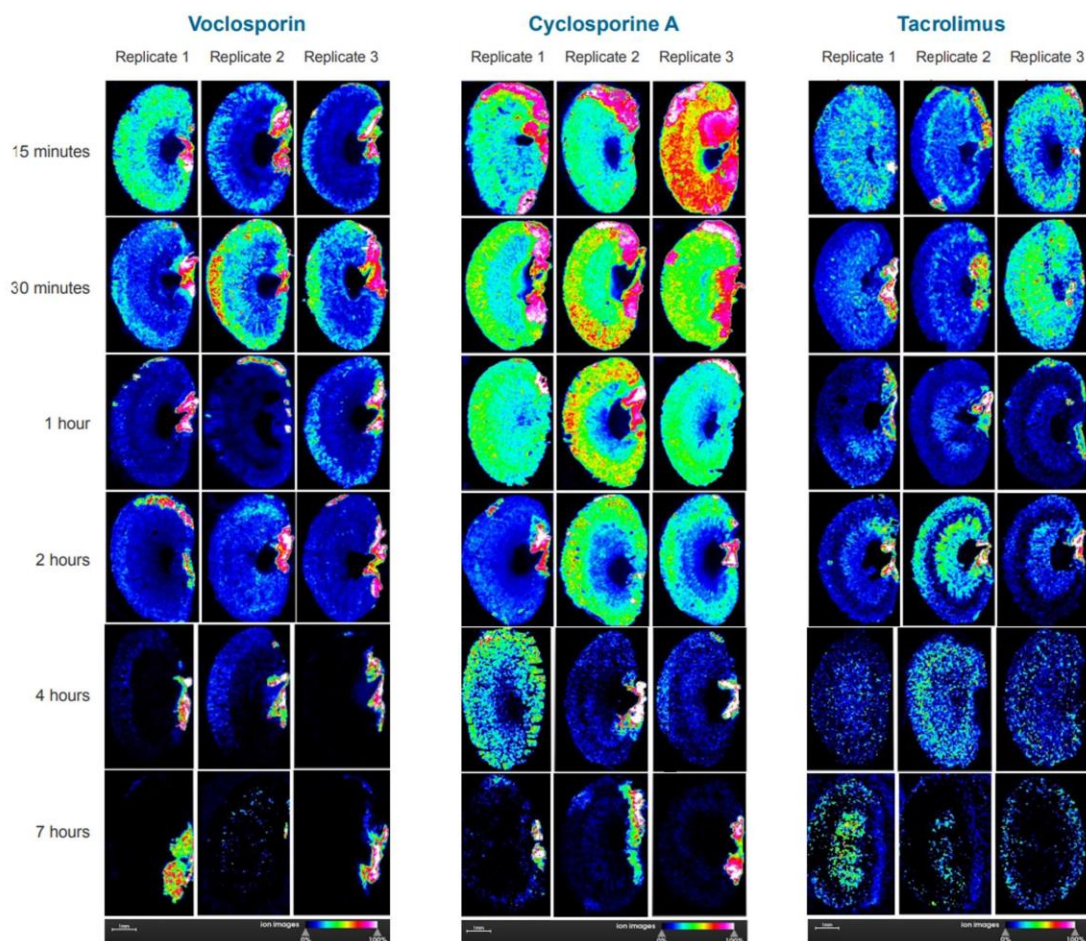
Each panel represents the imaged kidney from a single animal, with three replicates imaged at each time point for each calcineurin inhibitor. Images collected via MALDI-MSI. The greater the concentration of drug present, the greater the intensity of color in the image, with blue indicative of low concentrations and white indicative of high concentrations.

Table 1. Published pharmacokinetic data in humans[1-3]

	CL	CL/F	f_u	Expected CLr (Passive filtration)	Actual CLr	Actual CLr/Expected CLr
Cyclosporine A	210-240 mL/min	500-600 mL/min	10%	12.5 mL/min	1.48 mL/min	11.8%
Tacrolimus	37.5 mL/min	NA	1%	1.25 mL/min	0.014mL/min	1.1%
Voclosporin	NA	1060 mL/min	3%	3.75 mL/min	7.82 mL/min	208.5%

Passive filtration = GFR x f_u. Expected CLr > actual CL is suggestive of renal reabsorption. Expected CLr < actual CL is suggestive of renal secretion. CL, clearance; Clr, renal clearance; F, bioavailability; fu, fraction unbound in plasma; GFR, glomerular filtration rate; NA, not applicable.

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Poster number: 237

Submission number: 239

Proliferative glomerulonephritis with monoclonal immunoglobulin deposits, a membranoproliferative glomerulonephritis pattern of injury: searching for a clone in a haystack

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Lancashire Teaching Hospital NHS Foundation Trust, Preston

Dr Michelle Chyn Zhen Chong

Biography
Renal and Intensive Care Medicine Higher Specialty Trainee

Abstract

Membranoproliferative glomerulonephritis (MPGN) is a term most often used to describe a morphologic pattern of glomerular injury caused by aetiologically distinct forms of glomerulonephritis (GN.) The aetiology of differential diagnosis depends on the immunofluorescence and ultrastructural findings. We describe a case of a renal biopsy showing a MPGN pattern of injury without detectable clone on blood tests but with restriction to light chain.

Our patient is a 66 year old gentleman who presented with several months history of shortness of breath on exertion and peripheral limb oedema. He was initially investigated and treated for heart failure. He was found to have nephrotic syndrome with hypoalbuminaemia and 7g of proteinuria, associated with renal dysfunction (eGFR 28) which progressed over the next few months (eGFR13). Serum free light chain demonstrated normal kappa:lambda ratio. Serum cryoglobulin was negative. The first renal biopsy demonstrated features in keeping with membranoproliferative glomerulonephritis with electron dense deposits within the mesangial, subepithelial and subendothelial spaces of uncertain significance. Renal biopsy was repeated and expert opinion was sought as immunofluorescence was not performed at our centre. Immunofluorescence was performed on paraffin sections after pronase digestion. This demonstrated granular capillary wall staining for IgG, IgM and kappa leading to the diagnosis of PGNMID. He underwent a bone marrow biopsy which showed normal plasma cells. Given that there were no clones detected in bone marrow, we made the decision to treat with a combination of B-cell and plasma-cell based therapy. We commenced him on Rituximab as well as bortezomib, cyclophosphamide and dexamethasone (VCD). At present time, he has completed 2 doses of Rituximab and 4 out of 6 cycles of VCD chemotherapy. He has tolerated treatment well with improvement in renal function to an eGFR 30 and reduction in proteinuria to 2g without any adverse effects (as shown in the Figure below).
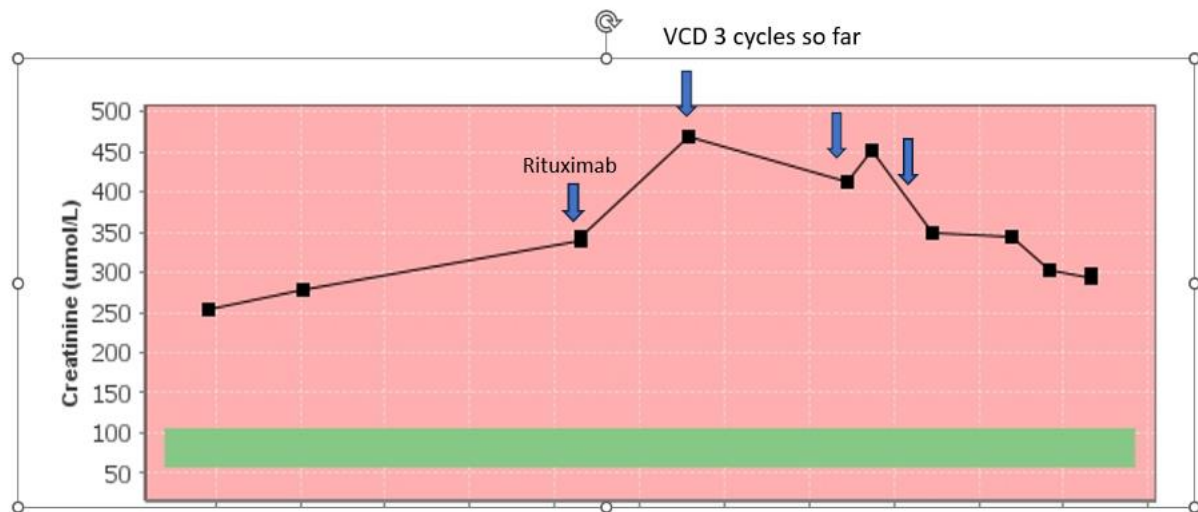
Proliferative glomerulonephritis with monoclonal immunoglobulin deposits (PGNMID) is a newly recognised entity within the spectrum of monoclonal gammopathy of renal significance (MGRS). It presents with a histological phenotype that resembles an immune complex-mediated GN. We emphasise that as this is still a novel disease, a high index of suspicion is required to attain the diagnosis and consideration of thorough immunofluorescence analysis should be performed, particularly immunofluorescence performed after pronase digestion on paraffin sections as it is reported to have higher sensitivity in detection of kappa light chain. This is particularly important when faced with MPGN pattern of injury.

While there are still varying opinions on how these patients should be treated, especially when the type of clonal cell is undetectable, we demonstrate the benefit with renal recovery in using a combined chemotherapy regimen to hypothetically target both possible clones. Treatment is also important in patients who may require renal transplantation lest they develop end stage renal disease as the incidence of early recurrence of PGNMID in a renal allograft is high. Understandably, further studies are required to identify which patients would benefit from this approach in management.

References

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Poster number: 238 – WITHDRAWN

Poster number: 239 - WITHDRAWN

Poster number: 240

Submission number: 342

Annexin A1 in ANCA-associated vasculitis: a potential biomarker of disease activity and prognosis

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Dr Aruni Ratnayake

Biography
Aruni is a graduate of Cambridge University (2013), and is training as a renal trainee in the South London deanery. She is currently in the third year of her PhD at Imperial College London, assessing the role of Annexin A1 in ANCA-associated vasculitis.

Abstract

INTRODUCTION

Neutrophils are key effector cells in the pathogenesis of ANCA (anti-neutrophil cytoplasmic antibody)-associated vasculitis (AAV). Once activated, they undergo a series of downstream inflammatory responses including formation of neutrophil extracellular traps (NETs)[1,2] and release of cytokines. These cause endothelial damage of blood vessels, promoting thrombosis formation by platelet recruitment and exposure of subendothelial tissue factor (TF). Thrombotic events have been reported in nearly 10% of AAV patients globally[3] and are a predictor of mortality[4]. NETs independently stimulate thrombosis by expressing TF[5] and enhancing Von Willebrand Factor (VWF) binding[6].

Annexin A1 (AnxA1) is a glucocorticoid-regulated protein released on neutrophil-mediated inflammation. Studies have demonstrated AnxA1 inhibits NETosis and initiates neutrophil apoptosis of *in vitro* models of inflammatory conditions (e.g. sickle cell disease), inhibiting both thrombosis and inflammation[7]. Although NETs play a major role in pathogenesis of AAV, the potential role of AnxA1 in modulating thrombo-inflammatory pathways in AAV is unknown. We investigated the potential role of serum AnxA1 as a biomarker in AAV by correlating AnxA1 levels with disease parameters, thrombotic events, and clinical outcomes.

METHODS

Serum levels of AnxA1 was measured using an AnxA1-specific ELISA in patients with AAV, (both active and in remission), IgA nephropathy, non-autoimmune causes of chronic kidney disease (CKD) (e.g. diabetes), and healthy individuals (HC) as the control groups. Clinical and laboratory parameters of AAV disease activity were obtained from electronic patient records. All patients provided written consent for samples to be used for research, and appropriate research ethics approval was obtained.

RESULTS

Patients with active AAV (n=45) had significantly raised levels of circulating AnxA1, compared to those in remission (n=45), CKD (n=28), IgA nephropathy (n=16), and HC (n=26), (Figure 1A, *p=0.0009*). In paired samples, AnxA1 levels reduced from active disease to remission (Figure 1B, *p=0.016)*. In AAV, AnxA1 levels significantly correlated to measures of disease activity including BVAS score (r=0.3612, *p=0.0005*), CRP (r=0.3618, *p=0.0005*), neutrophil count (r=0.2765, *p=0.0083*). and ANCA titre (r=0.2971, *p=0.0045*). There was no significant correlation between AnxA1 levels and renal function or proteinuria.

Within the AAV cohort with active disease, 6/45 (13%) suffered a thrombotic event within 1 month of sample date. There was a trend towards raised AnxA1 in these patients, however this was not statistically significant (*p=0.2079*).

In AAV, higher baseline AnxA1 levels were associated with a significantly longer time to relapse at 36 months follow-up, compared to patients with low or undetectable AnxA1 (Figure 1C, *p=0.0475*). As of December 2023, raised AnxA1 levels were also associated with better survival rates (Figure 1D), but this did not reach statistical significance.

DISCUSSION

We have demonstrated that increased circulating levels of AnxA1 correlates with disease activity in AAV. Additionally, patients with higher baseline AnxA1 titres have better clinical outcomes and longer time to relapse, suggesting this may be potential biomarker of disease. Whilst the exact role of AnxA1 in AAV is unknown, our data suggest that AnxA1 is released during active phase of disease, and may have a pro-resolving function that limits subsequent thrombo-inflammation and predicts longer remission
. This could both determine and influence clinical outcomes for patients with regards to entering remission and reducing end-organ damage.
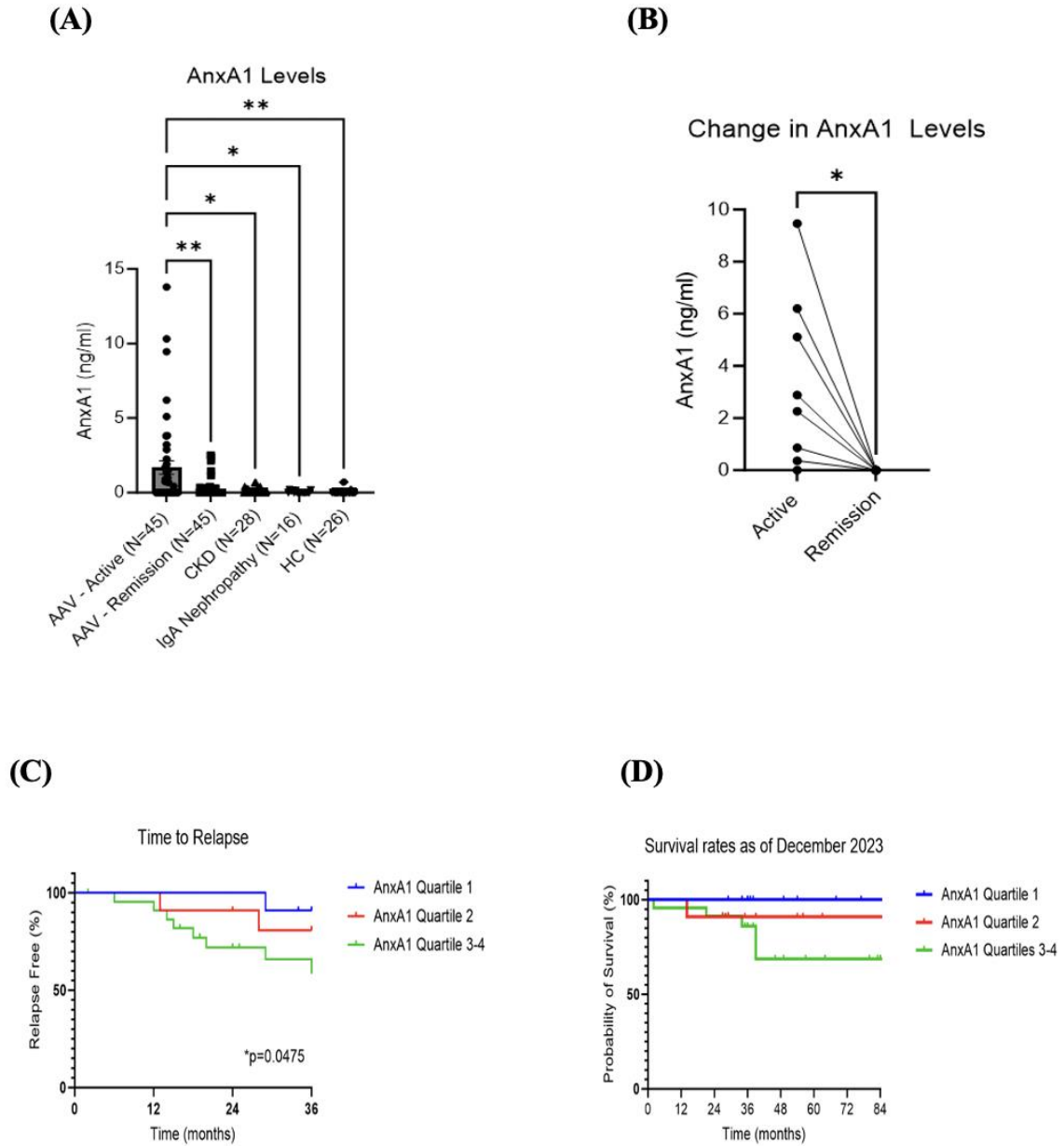
Figure 1: AnxA1 Levels in Patients with AAV (active and remission) and disease controls
Measure of AnxA1 levels by ELISA (A) and change in AnxA1 levels from active AAV to remission (B). Kaplan Meier curve depicting time to first relapse of AAV patients from diagnosis categorised by quartile AnxA1 titre (p=0.0475) (C). Kaplan Meier curve depicting survival rates of AAV patients from diagnosis to December 2023, categorised by quartile AnxA1 titre (p=0.2241) (D). Data presented as mean ± SEM (A). Statistics by One Way ANOVA (A), paired Wilcoxon Test (B), and Log-rank (Mantel Cox) tests (C and D). *p<0.05, **p<0.005.

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Poster number: 241

Submission number: 544

Belimumab treatment in membranous nephropathy: long-term follow-up

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Dr Lisa Willcocks

Biography
Dr Lisa Willcocks is a consultant nephrologist at Addenbrooke's Hospital since 2010. She is an Oxford graduate and completed her PhD in immunology at Cambridge University. She specialises in glomerulonephritides and vasculitis, and leads clinical trials in glomerulonephritis. In addition to the above, she also works within the Cambridge transplant service and is also the joint training programme director for renal specialist training in the East of England deanery.

Abstract

Introduction

Primary membranous nephropathy (MN) is among the main causes of nephrotic syndrome in adults. It is an autoimmune disorder caused by circulating autoantibodies targeting glomerular podocytes. Autoantibodies against the phospholipase A2 receptor (PLA2R) are identified in about 70% of patients with primary MN. Despite therapeutic advances over the past decades, complete remission rate of MN remains low.

B-cell activation factor (BAFF) and a proliferation-inducing ligand (APRIL) have emerged as a target of interest in glomerular diseases. Both have been demonstrated to be overexpressed in autoimmune diseases such as systemic lupus erythematosus, IgA nephropathy and MN, suggesting their potential involvement in the pathogenesis of these diseases. Inhibition of the BAFF/APRIL system has been shown to interfere with B-cell survival and differentiation, thus leading to B-cell depletion. In the phase 2 prospective, single-arm BEL116472 study, belimumab, a monoclonal antibody that binds BAFF, was shown to reduce proteinuria and PLA2R antibody in primary MN, highlighting its potential to become a disease-modifying treatment. However, there has been no report on the long-term outcome of belimumab in MN.

Methods

In this study, we report the results of an extended 10-year follow-up of all five MN patients treated with belimumab monotherapy (10 mg/kg, every 4 weeks, for up to 2 years) at our local hospital. Renal outcomes up to 10 years including renal relapse and renal function decline were retrospectively assessed. To evaluate therapeutic responses, we defined complete remission (CR) as proteinuria ≤0.3

g/d, partial remission (PR) as proteinuria ≤3.5 g/d and >50% reduction from baseline proteinuria and relapse as proteinuria ≥3.5 g/d after any remission.

Results

Of the five patients with MN, patient 1 remained in PR throughout the 10-year follow-up, whereas relapses occurred in the remaining four patients. All relapses were associated with PLA2R antibody re-emergence. Patients 2 and 5 were respectively in PR for 7 and 6 years before relapsing. Patients 3 and 4 were respectively in CR for 6 and 8 years before relapsing. Following relapse, patients 2 and 4 received a calcineurin inhibitor as additional immunosuppression, patient 5 received rituximab and patient 3 received a calcineurin inhibitor (which was not tolerated) followed by rituximab. Of those four patients, three had a favorable renal response with patient 4 achieving CR and patients 2 and 3 achieving PR at study conclusion. As expected, patient 4 in CR had the most favorable renal outcome and was the only one that did not experience renal function decline. Only patient 1 who remained in PR throughout the 10-year follow-up was referred to the low clearance clinic.
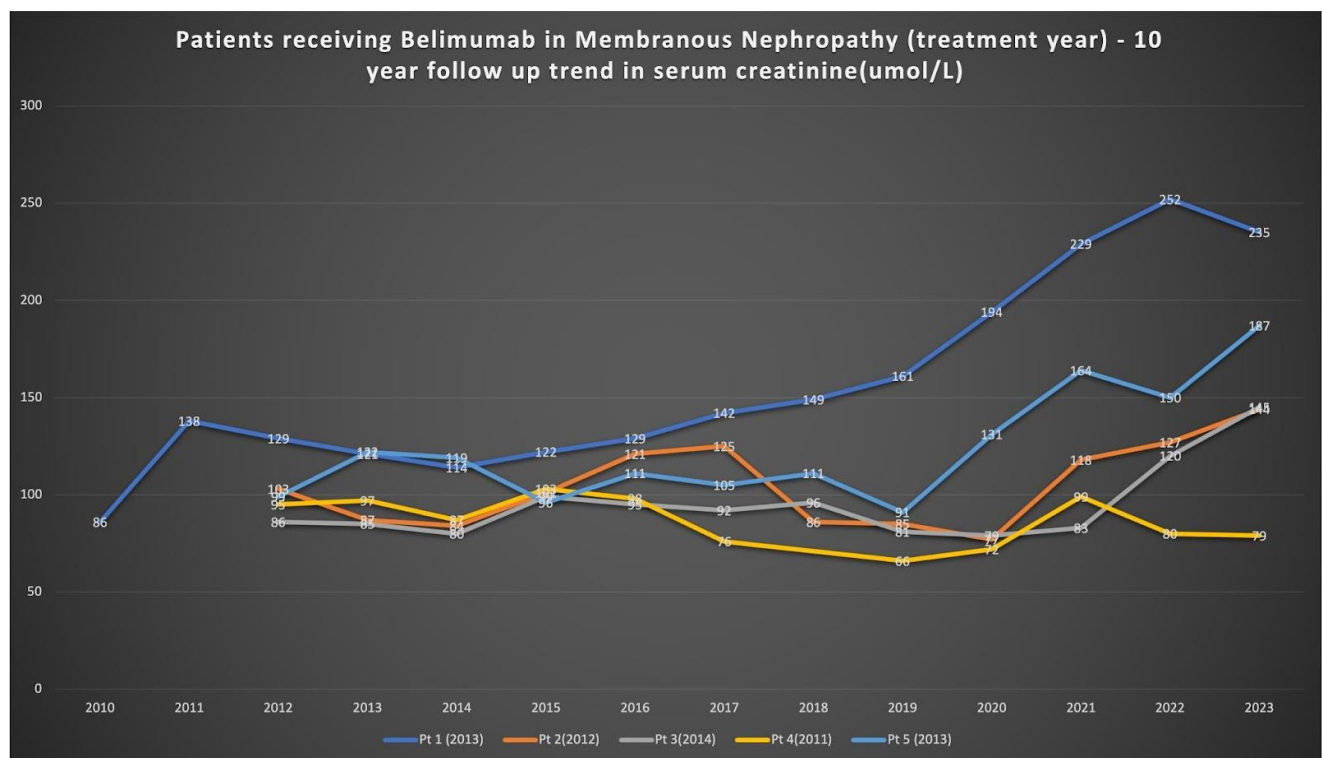
Panel A

Discussion

These data suggest that belimumab monotherapy is an effective option for the treatment of MN although associated with late relapses (after five years of remission). It also highlights CR as an important therapeutic target as it is more likely associated with preserved renal function. Further clinical

studies exploring the efficacy of BAFF/APRIL inhibitors in MN, alone or in combination with other therapies, are warranted.

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Poster number: 242

Submission number: 548

All Quiet on the Anti-PLA2R Front: Seronegative relapse of PLA2R-associated Membranous Nephropathy

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Wing Yin Leung

Biography
Dr Wing Yin Leung is a specialty training doctor in Renal Medicine currently working at Lancashire Teaching Hospitals NHS Foundation Trust in North West England. Her research interest includes novel therapeutic approaches in management of patients with glomerulonephritis.

Abstract

In patients with idiopathic MN (IMN) with positive serum anti-phospholipase A2 receptor antibodies (PLA2RAb), immunological monitoring is crucial during treatment. Depletion of PLA2RAb indicates immunological remission, and relapse can be anticipated with an increased antibody titre [1,2]. We present an unusual case where serum PLA2RAb was negative at time of 2nd relapse in a patient who was previously treated with Rituximab for PLA2R-associated MN (**Figure 1**).

A 63-year-old woman initially presented in July 2012 with nephrotic syndrome, with uPCR 1333mg/mmol and serum albumin (sAlb) 24g/L. She was diagnosed with PLA2RAb-mediated MN. Kidney biopsy did not suggest chronicity of disease. Partial remission was achieved following 8 months of the Ponticelli regimen. The patient was diagnosed with polymyositis in August 2013, and was started on Prednisolone and Azathioprine. She had a relapse episode of MN (uPCR 697mg/mmol, sAlb 34g/L) in mid-2018 with PLA2RAb positivity (immunofluorescence test 100 titre units, ELISA 51RU/ml). The patient received two doses of 1g Rituximab and achieved serological remission. Her kidney function remained stable with eGFR 40ml/min/1.73m^2.

Subsequently, her proteinuria returned to a nephrotic range (uPCR 650mg/mmol, sAlb 38g/L) in September 2022. It was unexpected however, that her serum PLA2RAb was negative in both assay immunofluorescence and ELISA on this occasion. The patient's proteinuria remained in nephrotic range after 9 months despite optimisation of supportive treatment including anti-proteinuric therapy and blood pressure control. She had preserved sAlb with slight decline in kidney function (eGFR 32ml/min/1.73m^2). Malignancy was ruled out. A repeat kidney biopsy demonstrated features suggestive of MN. Electron microscopy showed new subepithelial deposits and no features of scarring that would account for proteinuria. Subsequent immunostaining of kidney biopsy tissue confirmed PLA2R-positive membranous glomerulonephritis. The patient responded well to Rituximab (cumulative dose of 2g, slow

infusion of split dosages required due to previous mild reaction to Rituximab) again in this relapse episode and achieved partial remission in her proteinuria. PLA2RAb remains negative to date.

PLA2RAb is present in approximately 70% of IMN cases, and can be positive prior to the onset of MN [3]. Re-emergence and/or increased titre of PLA2RAb is indicative of relapse, with immunological changes usually preceding clinical course of disease [3,4]. Traditionally, in patients with known PLA2R-assocaiated MN, serial monitoring of PLA2RAb is a reliable tool during follow up as it is closely associated with recurrent disease.

There remain scarce evidence relating to cases of biopsy-positive stained but seronegative PLA2R-associated MN. B-cell depletion therapies such as Rituximab are established as treatments in reducing antibody response. Therefore, we consider here whether the previous use of Rituximab "masked" our case patient's PLA2RAb response. This scenario certainly brings further questions between the role of routine serial PLA2R monitoring versus requirements for repeat kidney biopsy in our current paradigm of relapsed MN management, and propose further studies be done to ascertain present unknowns.
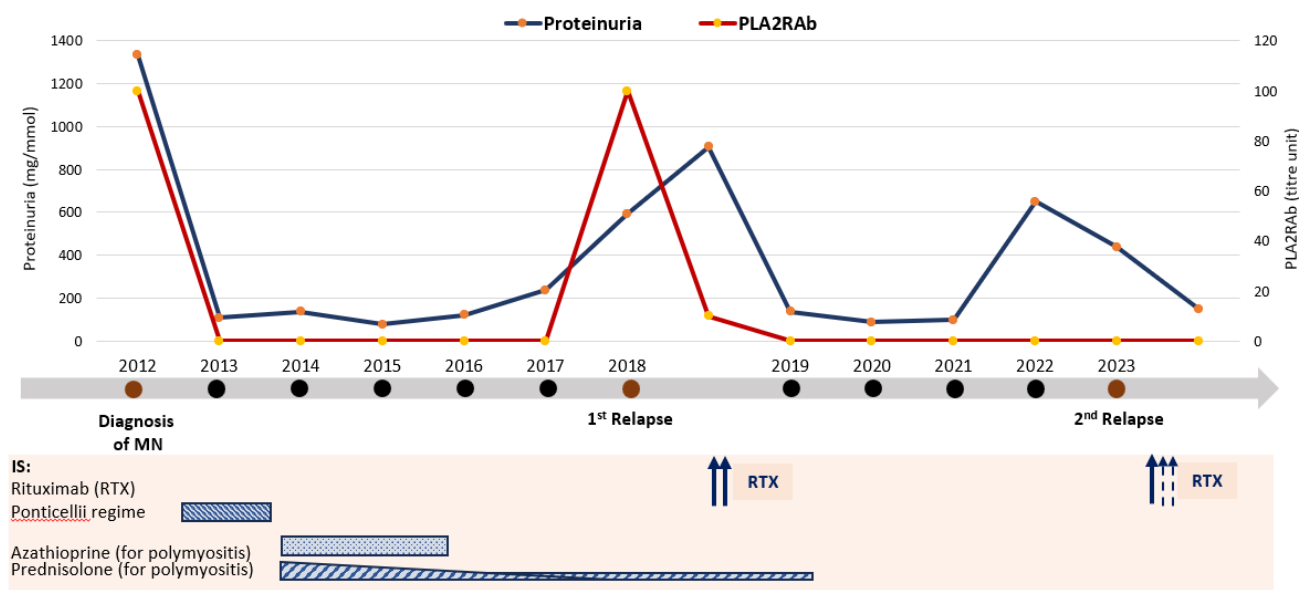
Figure 1. Timeline illustrating the clinical course of PLA2R positive MN, serological and proteinuria changes, along with immunosuppressive treatment received. MN: Membranous Nephropathy; PLA2RAb: anti-phospholipase A2 receptor antibodies; IS: Immunosuppression; RTX: Rituximab, solid arrow=1g, dashed arrow=500mg.

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Poster number: 243

Submission number: 562

Autoimmune Glomerular Disease Services in the UK- A National Survey

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Lucy Francis

Biography
Lucy studied Medicine at Kings College, London and holds a BSc in Management from Imperial College, London. She is an East of England trainee and an ST7 nephrology registrar at Addenbrookes, Cambridge. With Addenbrooke's charitable trust funding, she is working as a clinical research fellow, with a specific interest in vasculitis and lupus.

Abstract

Introduction:

Glomerulonephritis (GN) accounts for 20%–25% of prevalent CKD cases in most renal registries and is a major cause of end stage kidney disease worldwide. Both the 2021 UK Rare Disease Framework and the national report for renal medicine from the Getting It Right First Time (GIRFT) Programme have brought attention to important disparities in rare diseases and nephrology respectively. They outline commitments to integrated care and equity of access. This national survey aimed to understand unmet needs specifically within GN services; particularly service delivery, access to high-cost medications and embedding research in clinical practice.

Methods: An online survey was designed by and distributed nationally by the UK Kidney Research Consortium GN Clinical Study Group. Qualitative content analysis was undertaken.

Results:

Responses were received from 72 adult nephrologists and 10 paediatricians from 55 centres. Responses were received from the eight NHS England renal networks, Northern Ireland (NI), Scotland and Wales. 74% (n=53) of adult nephrologists were from tertiary centres.

Amongst adult nephrologists 68% (n=49) had a dedicated GN clinic, 39% (n=28) had further cohorting of patients according to disease subtype (vasculitis/lupus/primary GN) and 35% (n=25) had more than one clinic/week. Most had infusion and plasma exchange services and an in-house MDT (92%, n=66, 83%, n=60 and 78%, n=56 respectively).

Respondents lacking access to; a speciality clinic were 32% (n=23), in-house specialist GN consultant support were 29% (n=21), specialist GN nurse were 65% (n=47) and any renal research nurse support were 22% (n=16). 52% of those with no specialist clinic were from non-tertiary centres. 63% (n=45) had no regional multi-disciplinary meeting (MDT) and 65% (n=47) had no dedicated patient messaging service.

In England, blueteq access was available for rituximab for 78% (n=47), avacopan 78% (n=47), belimumab 50% (n=30) and voclosporin 48% (n=29). 21 responses highlighted alternative arrangements for accessing high-cost therapies, such as individual patient funding requests, the Scottish Medicines Consortium and the Welsh Health Specialised Services Committee.

Specific response themes emphasised 1. the importance of specialist nurses support (n=28) 2. lack of access to regional MDTs (n=13), 3. the need for pharmacist support (n=4). Other suggestions to improve local services included dedicated clinics, more funding, greater consultant time and access to high-cost drugs.

Commercial and non-commercial research were conducted at 75% (n=41) and 60%(n=33) of centres respectively. 94% of respondents would like to do more research on these diseases (n=68) and 78% would like to specifically set up their own studies (n=56). Clinician time was the most prohibitive factor in conducting research (n=31). Protected time on consultant job plans (n=8), recruitment of research nurses (n=14) and funding (n=5) were other concerns.

Paediatric responses highlighted unmet needs for; specialist nurses, a national paediatric vasculitis network, national paediatric inflammatory service commissioning and earlier access to B-cell depletion therapy.

Discussion:

This survey highlights disparity in access to specialist GN nurse support and regional MDTs. Across the UK there remains variation in access to high-cost drugs. Despite increasing NHS constraints, enthusiasm remains to embed research into clinical practice.
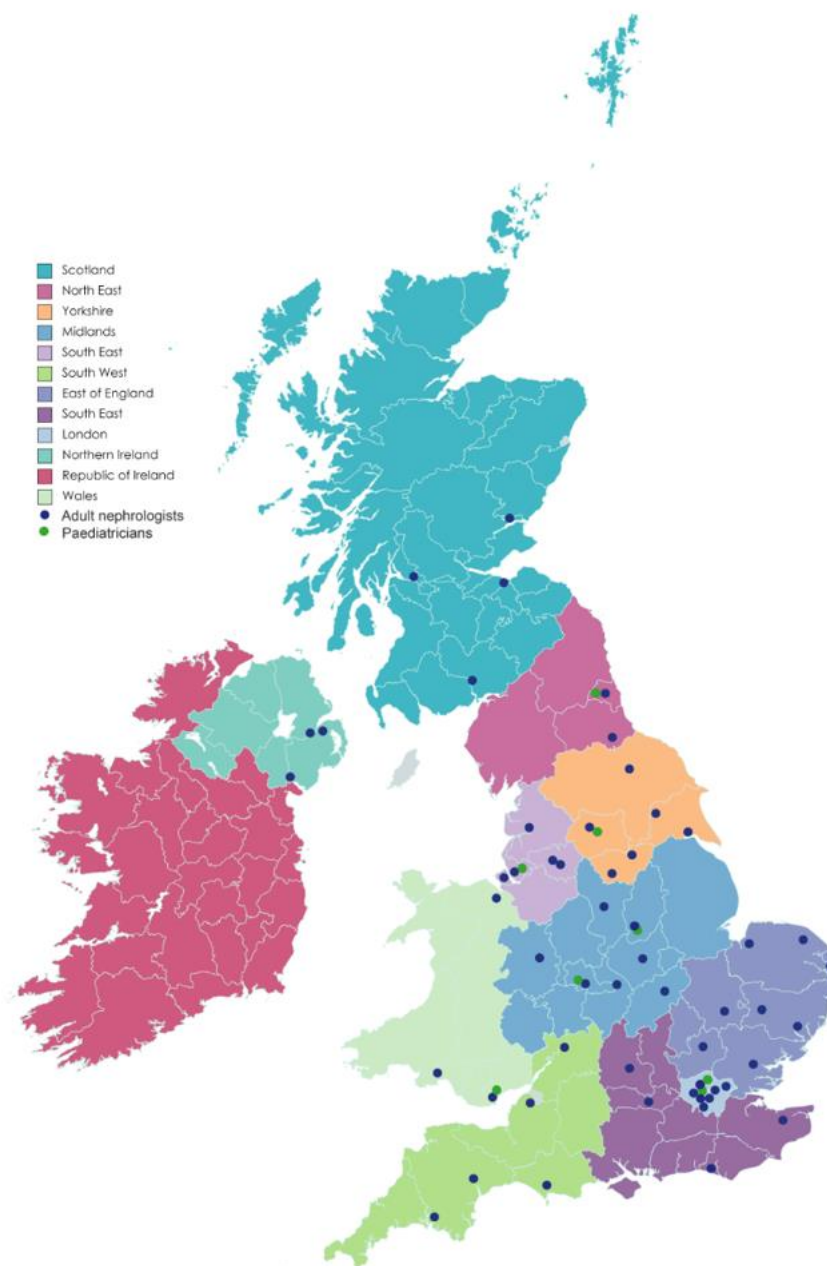
Figure 1. Adult nephrologist (blue) and paediatric (green) responses on autoimmune glomerular disease services from across the UK (one dot per centre)

Poster number: 244

Submission number: 587

Impact of induction immunosuppression for ANCA associated vasculitis on ANCA status at 6 months

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Lucy Francis

Biography
Lucy studied Medicine at Kings College, London and holds a BSc in Management from Imperial College, London. She is an East of England trainee and an ST7 nephrology registrar at Addenbrookes, Cambridge. With Addenbrooke's charitable trust funding, she is working as a clinical research fellow, with a specific interest in vasculitis and lupus.

Abstract

Background/ Objectives:

Current international guidelines recommend the use of cyclophosphamide (CYC) or rituximab (RTX) with glucocorticoids as induction therapy for ANCA associated vasculitis (AAV). Studies examining the use of combination agents (CYC+RTX) as induction therapy remain limited. We aimed to evaluate the clinical characteristics and treatment outcomes of AAV patients who received CYC or RTX or CYC+RTX with glucocorticoids.

Methods:

A retrospective study using electronic medical records of patients from a single tertiary centre was performed from 2014 to 2022. AAV patients with biopsy confirmed kidney involvement were included. The CYC+RTX combination therapy consisted of 2 doses of intravenous CYC and 2 doses of RTX. The clinical characteristics and laboratory results were analysed using Statistical Package for the Social Sciences (SPSS) version 29 software.

Results:

A total of 156 patients were included and followed for a median of 41 months (interquartile range, IQR 22-71). There was a male preponderance (n=98, 63%) with median age of 69 years (IQR 59-75). The majority (n=91) presented with acute kidney injury, median eGFR at diagnosis 25 ml/min/1.73m^2 (IQR

12-48). Myeloperoxidase (MPO) ANCA was more common (n=88, 56.4%) than proteinase-3 (PR3) ANCA (n=68, 43.6%).

Seventy three (46.8%) received CYC as induction therapy, 43 (27.6%) received RTX while 40 (25.6%) received CYC+RTX. Patients who received CYC+RTX combination therapy were younger, median age 62 years compared to 68 and 78 years for the CYC and RTX groups. The CYC+RTX group had a lower eGFR at presentation (median 16 ml/min/1.73m^2) compared to 26 ml/min/1.73m^2 and 30.5 ml/min/1.73m^2 for the CYC and RTX groups.

The median MPO ANCA level at 6 months post-induction was 2.6 iu/ml for the CYC+RTX group while the levels were 7.6 iu/ml and 11.5 iu/ml for the CYC and RTX groups respectively (*p*=0.6). The median PR3 ANCA level at 6 months was 6.3 iu/ml for the CYC+RTX group in comparison to 13 iu/ml for both CYC and RTX groups (*p*=0.44). Despite the reduction in ANCA levels, the majority of patients still had persistent haemoproteinuria at 6 months. The rate of relapse was comparable in all treatment groups

Conclusions:

The CYC+RTX combination therapy may reduce ANCA levels more rapidly than CYC or RTX alone for AAV patients with severe renal impairment. In this real life cohort, selection bias for treatment group interplays with clinical outcomes. Potential confounders to ANCA response at 6 months include disease severity, age, sex, starting ANCA level, and concomitant glucocorticoid dosing. Multivariate analyses will therefore be performed to adjust for the impact on confounders on ANCA response.

Figure 1: ANCA levels at diagnosis and at 6 months following induction
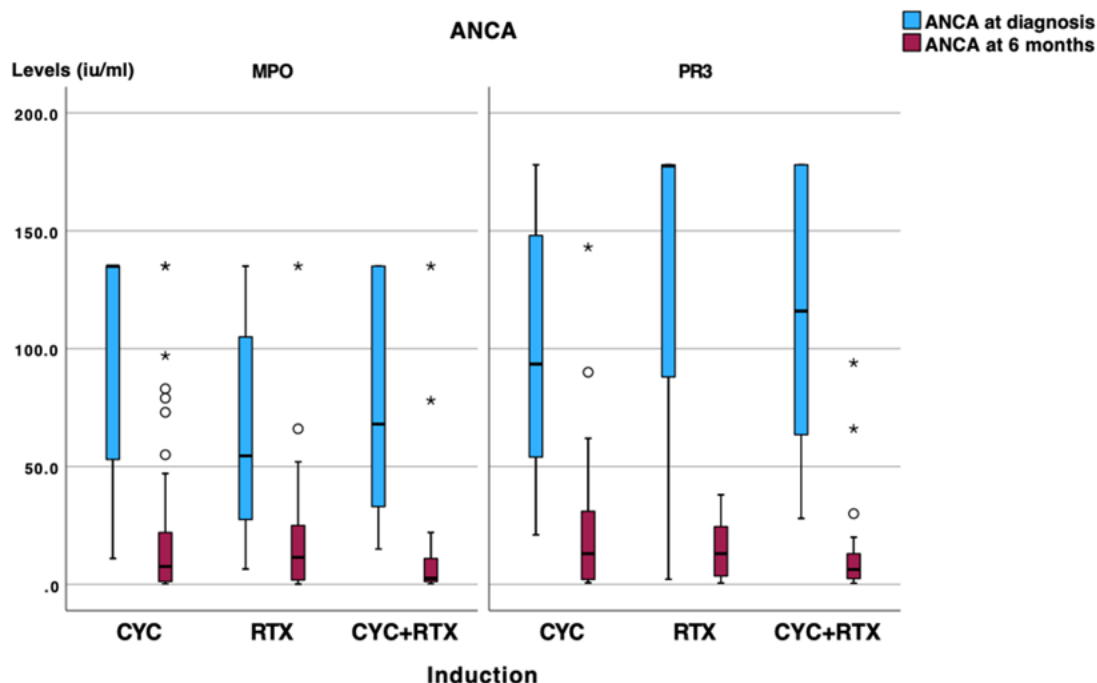
Footnote: Upper limit of detection for MPO ANCA is 134 iu/ml and for PR3 ANCA is 177 iu/ml

Poster number: 245

Submission number: 578

ANCA associated glomerulonephritis with IgA deposits or ANCA-positive IgA nephropathy ?

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Unidade Local de Saude de Braga, Portugal, Braga

Dr. Joana Medeiros

Biography
Interno de Nefrologia na Unidade Local de Saude de Braga

Abstract

INTRODUCTION: Antineutrophil cytoplasmic autoantibodies (ANCA) associated glomerulonephritis (GN) is typically a pauci-immune necrotizing and often crescentic, with few or no glomerular immune complex deposits detectable by immunofluorescence (IF) or electron microscopy (EM). IgA nephropathy (IgAN) is characterized by mesangial immune complex deposits containing IgA and is rarely associated with ANCA.

CASE PRESENTATION: 47 years-old man, with history of silicosis, and allergic rhinitis is referred to a nephrology consultation due to hematoproteinuria (25 to 50 erythrocytes/µL with dysmorphia in urinary sediment and urinary protein/creatinine ratio (P/CR) of 3.7g/g). In the last 10 years, patient reported 3 episodes of purpuric skin lesions on the lower limbs associated with arthralgias and macroscopic hematuria, 2 of them with a concomitant infection. During this period, serum creatinine (sCr) remained within a normal range (0.7-0.8mg/dL). The autoimmunity panel revealed an elevated titer of myeloperoxidase-ANCA (MPO-ANCA) (77 IU/mL to a positive range > 20 UI/mL). A renal biopsy was performed. In light microscopy (LM), 25 glomeruli were represented, 1 with global sclerosis, 1 with segmental sclerosis, 4 with fibrocellular crescents, 2 with mesangial hypercellularity and 3 with segmental endocapillary hypercellularity; remaining glomeruli with ischemic changes without fibrinoid necrosis. IF showed slight mesangial staining of IgA, C3c, kappa and lambda with a vestigial trace of IgG; C1q and IgM were negative. Repeated measurement of MPO-ANCA showed an increasing titer (93 IU/mL), with worsening azotemia and proteinuria (sCr 1.5mg/dL and P/CR 5g/g). ANCA associated GN (ANCA-GN) was assumed and induction immunosuppression regimen was started (corticosteroids and rituximab). Two months after the kidney biopsy, the result of EM was known showing immune-type deposits at the mesangial level and in the mesangio-capillary transition. Although some results from LM and EM were more favorable to the diagnosis of IgAN, after the end of induction immunosuppression an improvement in renal function was observed with sCr 1.2mg/dL and decreasing proteinuria with P/CR 1.3g/g.

DISCUSSION: This report describes a pauci-imune glomerulonephritis with mesangial and endocapillary hipercelullarity on LM and mesangial electron-dense deposits by EM in a patient with positive ANCA serological test results. It is difficult to determine which disease is more preponderant in renal damage -

whether ANCA-GN or ANCA-positive IgAN. Some reports suggest that ANCA-positive IgAN patients were younger and had fewer extrarenal manifestations, milder renal damage, more mesangial and endocapillary cellularity, and more immune complex depositions when compared with ANCA-GN patients. In rare reports of ANCA-positive IgAN, the causal relationship between IgAN and ANCA is not clear and the nephritogenicity of ANCA has not yet been clearly elucidated. Some studies showed that ANCA-positive IgAN patients had more severe clinical and histological features when compared with ANCA-negative IgAN patients and they were comparable to ANCA-GN, and their renal outcomes were relatively better with aggressive immunosuppressive therapy in the short term. Since our patient presented signs of systemic vasculitis, namely cutaneous purpura, we decided to perform a more aggressive immunosuppression regimen with corticosteroids and rituximab, in a manner similar to the treatment for ANCA-GN. Instead of cyclophosphamide, we used rituximab to avoid the risk of infertility, as our patient did not have rapidly progressive glomerulonephritis. We present a rare condition where ANCA-GN and IgAN overlap, showing similarities to the former in terms of their histological features and the potential to benefit from aggressive therapy.

Poster number: 246

Submission number: 154

Automated paediatric eGFR across a children's hospital

Dr Yincent Tse[1,2], Mr Andrew Heed[3]

[1]Great North Children's Hospital, Newcastle Upon Tyne, United Kingdom. [2]Newcaslte University, United Kingdom. [3]Newcastle Upon Tyne Hospitals NHS Trust, United Kingdom

Dr Yincent Tse

Biography
Paediatric nephrologist with an interest in Quality Improvement. Co-chair of UKKA Patient Information Committee

Abstract

Introduction

Creatinine results needs transforming into estimated glomerular filtration rate (eGFR) to be useful clinically: for medication adjustments in kidney impairment, to monitoring acute kidney injury, and to communicate severity of chronic kidney disease to families. This has been standard practice in adult primary and secondary care for many years.

In 2019 our children's hospital adopted electronic patient records. Where a height is available on the results view this automatic generates eGFR calculation using the Bedside Schwartz formula 2009 which is internationally the most recognised and accepted for paediatric use. We studied its utility.

Methods

Observational, electronic medical record–enabled study of creatinine measurements at our hospital of children ³12 months and <16 years between January 2022 and May 2023. eGFR was automatically calculated and displayed if a height was available within six months. Low eGFR was defined as <90 ml/1.73m^2/min.

To ascertain clinician response to low eGFR, a subset of medical records of patients with 1-2 eGFR measures were reviewed, with minimal 6 months follow up.

Results

Over 17 months 41,286 creatinines were measured. Height was available for 28,215 (68%) creatinines so auto-generating an eGFR in 5,264 children. 58% were generated during 4,309 in-patient or emergency

care episodes, remainder during out-patients. 59%, 24%, 9% and 9% of children had one, 2-4, 5-9 or [3]10 eGFR results respectively.

23% of eGFR measures were low with 12.5% 60-89, 5.7% 30-59 and 4.6% <30 ml/1.73m^2/min. Low eGFR samples were most prevalent in nephrology (77%), intensive care (19%), cardiology/cardiac surgery (17%) and surgery (9%) samples.

Analysis of 1463 children with [3]3 eGFR measures showed substantial eGFR change between best and worse valves during study period. Of 1313 children with best eGFR [3]90 ml/1.73m^2/min, 21% had worse eGFR 60-89 and 7.6% <60. Of 88 children with best eGFR 60-89 ml/1.73m^2/min, 41% had worse eGFR <60.

We gauged clinician response to low eGFR using a subset of patients with 1-2 measures and had available electronic notes. Of 46/514 (8.9%) with eGFR <90, at follow up of six months 12 did not have eGFR repeated: in eight the creatinine value was within range for age, two were adult sized adolescents, and no reason given in two. In remainder appropriate action was taken.

A survey of parents and non-nephrologist healthcare staff found high acceptability and preference of eGFR over creatinine.

Conclusion

With electronic patient record and processes to routinely measure lengths or heights we have shown it is feasible to auto-generate paediatric eGFR for all specialties. As many children had substantial changes in eGFR the next step will be to study its utility to detect acute kidney injury or to aid medication renal dose adjustments.

We recommend all hospitals with electronic medical records move to paediatric eGFR like in adult medicine.
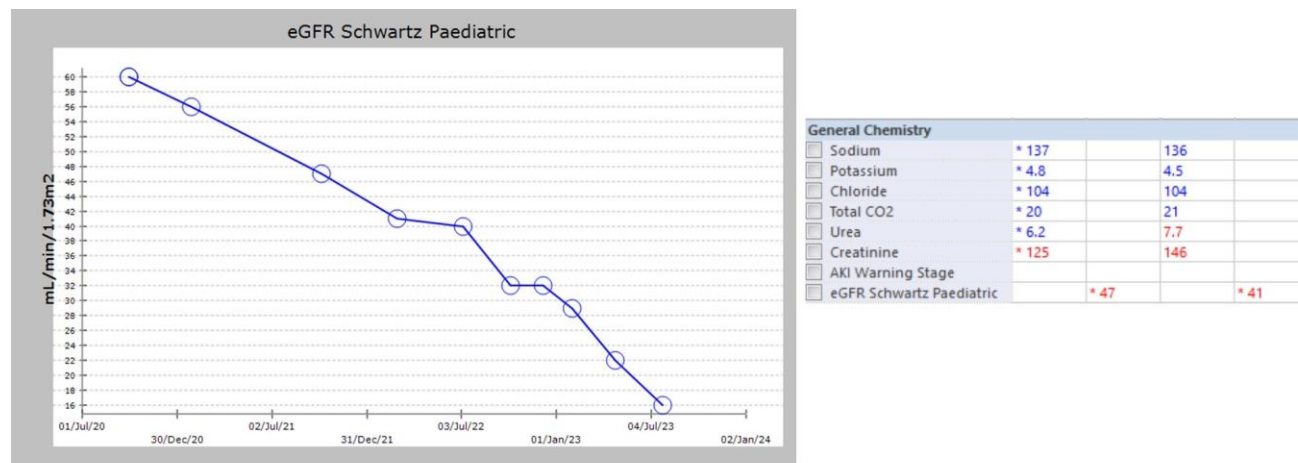
Figure a) Example of paediatric eGFR graph plotted over time, b) Automated eGFR displayed in results view.

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Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

Our institution has approved this observation study as service evaluation

Poster number: 247

Submission number: 258

Improving the experience of young adult patients on haemodialysis through development of a paediatric-to-adult dialysis transition pathway prioritising independence through shared care dialysis.

Mr Delison Davis Koola[1,2], Ms Laura McGuiness[1,2], Ms Meredith Suttle[1,3], Dr Alexa Wonnacott[1,2]

[1]Cardiff and Vale UHB, Cardiff. [2]University hospital of wales, Department of Nephrology. [3]University hospital of wales, Department of paediatrics

Mr Delison Davis Koola

Biography
Delison is an internationally trained haemodialysis nurse. He has worked in Haemodialysis units in India and the United Kingdom. Delison has experience in both paediatric and adult patients on haemodialysis and in the last couple of years, has identified transition of care for adolescent patients as an area of interest within his role as deputy team leader. He has been working to improved shared care on the dialysis unit and has been a key point person for patients who are transitioning to the adult haemodialysis unit.

Abstract

Introduction: Adolescent patients receiving dialysis frequently have complex medical, social and psychological needs (Rees et al. 2017). Development and implementation of a transition pathway that recognises the importance of patient-centred, holistic support is key for successful transition of patients from paediatric to adult haemodialysis (HD) services (Peter et al. 2009). Whilst use of existing transition programmes for outpatient management of chronic illness, such as "Ready, Steady, Go" (Nagra, 2020) are in widespread use in the pre-dialysis cohort, there is a noted absence of equivalent pathways in place for those patients already receiving HD. A local audit undertaken in a hospital-based haemodialysis unit, demonstrated greater interest in engaging in shared care in the prevalent under 25 year olds, versus older dialysis patients. A collaborative quality improvement project between paediatric and adult renal services was undertaken to formalise HD transition with a focus on developing independence and health ownership via early adoption of shared care HD principles, on an individualised basis.

Methods: Paediatric renal team perform quarterly review of all HD patients to identify those approaching eligibility for transition to adult services (Age 16-17). Young Adult "passports" are completed with multi-disciplinary team (MDT) support to highlight personal goals, educational aspirations, concerns and questions, as well as medical details inclusive of transplantation status. Passports are used as a framework for handover between unit MDTs. Phased unit transition is achieved as summarised in Figure 1, with focus on maintaining staff and unit familiarity during the transition. Concepts of shared care dialysis, health ownership (including set up on "Patient knows best" app) and independence from parents are introduced during this process, as

developmentally appropriate. Full transition is achieved over the course of approx. 8 weeks, but bespoke arrangements for 2:1 adult: paediatric dialysis sessions may continue for longer, if required. Dialysis slots are tailored according to the individuals academic/career needs. Following completion of the pathway, patients and their families are asked to provide feedback and offered the opportunity to become peer advisors.

Results: Since the pathway was introduced, 2 patients have transitioned successfully. Both patients report high levels of satisfaction and feel that they have settled in well. Of 6 total adolescent patients in the unit, 4 are actively participating in shared care with one planning to start. One further patient has additionally participated in the Kidney Care UK Shared Haemodialysis course to evaluate and improve practice specifically pertaining to activation of young adults in shared care participation.

Discussion: Early identification, preparation and phased MDT introductory approach can relieve patient and family anxiety during transition to adult HD services. Early introduction to shared care dialysis promotes independence, health ownership and accountability as adult renal patients.

Visit 1: Paeds unit
- *Adult unit staff visit for introductions to patient and family*
- *Transition to adult services educational material provided*

Visit 3: Adult unit
- *1st HD on Adult unit, accompanied by paeds staff member*
- *Introductions to MDT (SW/dietician)*

Adult unit walk-around visit
- *Walk through of a HD session*
- *Visit to adult outpatients and renal ward*
- *Explanation of procedures for admissions under adult services*

Young adult eligible for transition

Formal move to Adult unit

wk 4 | wk 7+

wk 2 | wk 3 | wk 6

- *Young adult passport completed*
- *Referral made to Adult unit*

- *staged transition if required*
- *(2:1 Paeds: Adult unit sessions to transition as appropriate)*

Visit 2: Paeds unit
- *Introductions to Adult HCA staff*
- *Adult unit NS member to connect patient on machine*
- *Educational material on renal specific adult services provided*

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Poster number: 248

Submission number: 287

North-West Kidney Network: Improving transition and support in secondary education for paediatric patients with kidney failure in the north west.

Dr Amrit Kaur, Dr Dimitrios Poulikakos, <u>Dr Constantina Chrysochou</u>

North West Kidney Network, North West

Dr Constantina Chrysochou

Biography
Consultant nephrologist at Salford Royal Hospital and Honorary Senior Lecturer at the University of Manchester. She is the immediate past President of the Royal Society of Medicine's Nephrology Section Council. She is the UK lead for the Renal Rare Diseases register (RADAR) specialist interest group on FMD. Special interests in transition and glomerulonephritis and is the sub-group lead on Transition for the Renal Services Transformation Programme. Northern Care Alliance Lead for Freedom to Speak up Team. Co clinical lead NWKN (paediatric workstream).

Abstract

INTRODUCTION

The North-West Kidney Network (NWKN) hosted by NHSE North West Specialized Commissioning (2020-21) was established to optimise the provision of care for kidney patients.   We are the first network in the UK to include a paediatric work stream, co-led by an adult and paediatric nephrologist. Here we describe two projects which have been undertaken by the work stream.

1. Adoption of a regional transition policy
2. Visual educational resources for secondary school professionals to improve their understanding of the impact of kidney failure on educational attainment

METHODS

A working group was established with project specific focus groups within the structure. We had representation of all relevant stakeholder, adult and paediatric nephrology unit MDTs in the region, patients, carers, psychologist and education professionals.

RESULTS

1. Regional transition policy. Baseline survey of current services found huge variation of transition services if there was a designated clinic. Ages of patients seen varied from 16-30 years across the NW. There was no nephrology specific transition policy in use by any unit. Access to psychology or youth work services was inconsistent. Peer support programme was present in one unit. Majority used a transition toolkit to aid patient centred pathways. A regional policy

has been agreed by all six trusts involved (2 paediatric and 5 adults units). The policy encompasses care from 11-30 years of age. All nephrological conditions and not just transplanted patients are considered. It promotes joined up working across all nephrology MDTs with guidance on setting up and delivering transition services.

1. Visual educational resources aimed at teachers and SENCO workers in secondary education (key stages 3 and 4) have been devised to promote improved understanding of educating a pupil with kidney failure in this sector.   Young people with kidney failure have much poor outcomes emotionally, socially and educationally compared to healthy peers.   The resources provide an overview of chronic kidney disease, dialysis, transplant, diet and fluid restrictions and emotional and psychological effects of kidney failure. Patient lived experiences are shown together with impact of these individual aspects of management on learning. Finally, the resources provide practical steps that the secondary school can take to promotes better educational outcomes in this cohort.

DISCUSSION

Both policy and educational resources will be available on the public facing aspect of NWKN website for all to use. Next steps of the project will be to assess sustainability and impact over the coming years as both are adopted as part of the standard care for these patients.   Impact of collaborative working between adult and paediatric nephrology services in the north west have proved to be a successful partnership with the completion of two quality improvement projects of this calibre.

Poster number: 249

Submission number: 302

NHS England Highly specialised service for cystinosis: The story so far

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[1]Royal Manchester Children's Hospital, Manchester. [2]Evelina London Children's Hospital, London. [3]Birmingham children's hospital, Birmingham

Prof Sally Hulton

Biography
Consultant paediatric nephrologist

Presenting Autor
yes

Job Title
Consultant paediatric nephrologist

Organisation
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Abstract

INTRODUCTION

The first highly specialised outpatient service in nephrology which encompasses the entire lifespan of a patient with cystinosis, was commissioned by NHS England in July 2022. The seed for such a service was first planted by patient and professional groups in June 2014. We describe the design of the service across 3 paediatric units, the transition to adult units, patient outcomes and RaDaR data collection since commissioning.

METHODS

Three paediatric nephrology centres in England provide full-day 'one stop' clinics, which are located in London, Birmingham and Manchester. The multidisciplinary approach includes dedicated input from a nurse specialist, dietetics, SALT, ophthalmologist, nephrologist, endocrinologist, clinical geneticist and psychologist at each clinic. Transition to adult service is within the same trust at each location to a service which addresses the needs of adult patients. Shared care is provided with local and external partners in health and education.

RESULTS

Total of 49 paediatric patients have been referred to the service, 39 follow ups (already known to centres) and 10 new external referrals. In addition, 12 have been transitioned to the adult clinics. 87% have consented to RaDaR and annual data submitted. RaDaR data collection panels have been re-designed to provide valuable information on the multisystemic effects of the condition during lifetime (items addressed: demographics, genetics, kidney function, nutrition and growth, musculoskeletal, ophthalmology, endocrine, neurological problems, cystine depletion treatment and renal replacement therapy). 100% are receiving cysteine depletion therapy and aiming for therapeutic white cell cystine levels. Changes in renal replacement therapy: one patient was transplanted and one started haemodialysis, otherwise seen cohort have had stable renal function. No deaths during this period. No serious safety issues reported. All patients have submitted quality of life health questionnaires.

DISCUSSION

We have had a successful start with positive patient feedback in all 3 locations. The service is designed to complement and supports the care that is delivered locally. The centres are working in close partnership with the patient charity, Cystinosis Foundation UK, to ensure service values align with patient values. Patient and professional education development is planned in July 2024, where the Cystinosis Network Europe (CNE) International Conference will be hosted in Manchester. Collaborative partnerships with adult service have ensured that no patient has been lost following transition. Moving forward our aim is to reduce delays in diagnosis and treatment, improve access to research studies/new treatments and improve overall health outcomes in patients with cystinosis across their lifespan.

Poster number: 250

Submission number: 327

An audit of post-transplant surveillance in a prevalent paediatric renal transplant population in a national centre

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Dr Lucy Eskell

Biography
Lucy Eskell is a paediatric trainee based in Glasgow. She has an interest in paediatric nephrology and is aiming to subspecialise.

Abstract

Introduction

European best practice guidance on the care of the paediatric renal transplant recipient in 2002 and KIDGO guidance on care of the renal transplant recipient in 2009 both set out the rationale for ongoing surveillance of aspects of renal health in post-transplant patients. These include blood pressure, proteinuria, presence of donor-specific antibody, viraemic status, and obviously renal function. Ongoing chronic kidney disease care e.g. monitoring of haematinics and iron indices are also recommended. This audit aimed to assess growth indices, biochemistry and aspects of renal health of the post-transplant paediatric population at a national centre.

Methods

All prevalent post-transplant patients attending the centre from 01-January 2009 to 01-July 2023 were identified . Patients were included if information was available within the preceding 12 months i.e. they were in active follow-up. Data were collected from two electronic patient record systems, and scanned information from older records. Clinical data included weight, height, current medication, systolic and diastolic blood pressure, and ambulatory blood pressure monitor results. Biochemical data included GFR, triglycerides, cholesterol,proteinuria, vitamin D, HbA1c, ferritin, haemoglobin, iron, and transferrin saturation. If appropriate, missing data was sought via email from local centres.

Results

115 patients received kidney transplantation in the time period; 57 patients were in active follow-up. Missing data points were mostly due to ongoing follow up in local units.

56 patients had weight recorded in the preceding 12 months. 28 patients (50%) were underweight (BMI < 18.5), 23 (41.1%) were normal weight (BMI 18.5 - 25), 4 (7.1%) were overweight (BMI >25) and 1 (1.8%) was obese (BMI > 30).

55 patients had up to date clinic SBP recorded. 14 (25.5%) patients were hypertensive in clinic, of which 4 (28.6%) were on anti-hypertensive medication. 23 patients had an ABPM available from post-transplant, of which 5 (21.7%) were hypertensive. Of these 5 patients, 3 (60%) had masked hypertension and 4 (80%) were on anti-hypertensive medication. Of the 18 children with normal ABPM, 6 (33.3%) were on anti-hypertensive treatment.

50 patients had up to date GFR data from the preceding 12 months. The median GFR was 61 ml/min/1.73m2. The median change of GFR over 12 months was -1.1 L ml/min/1.73m2 (range -23.6 to 54.6)

51 patients had up to date haemoglobin data recorded. 21 (41.2%) had Hb <120, 4 (7.8%) with a Hb <100. 29 patients had recent haematinics. 2 patients (6.9%) had low serum iron <8u/L, and 14 (48.3%) had low Tsat <20%. 5 patients (9.8%) were on an erythropoietin stimulating agent, of whom 1 (20%) had Hb <100.

48 patients had urine Protein:Creatinine Ratio. 13 patients (27%) had proteinuria >20mg/mmol creatinine, in 4 (8.3%) >100mg/mmol. 3 (23.1%) proteinuric patients were on ACEi/ARB.

39/57 (68.4%) had 'optimal' renal health post-transplant. 18 (31.6%) had CKD elements identified in the preceding 12m, including abnormal GFR, proteinuria >100mg/mmol, or hypertension.

Discussion

Despite existing guidance and frequent review, several aspects of CKD/post-transplant care within our national centre can still be optimised, particularly ACEi use in proteinuric patients and surveillance and management of hypertension.

Poster number: 251

Submission number: 338

Does development of de novo Donor Specific Antibodies accelerate kidney allograft failure in children?

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Alaa Ali

Biography
Paediatric renal senior clinical fellow at Great Ormond Street Hospital for Children

Abstract

Introduction:

The development of *de novo* Donor specific Antibodies (dnDSA) has been linked with graft rejection and dysfunction in paediatric kidney transplant recipients. Routine surveillance for DSA is thought by some to have no clear role in the presence of normal allograft function in kidney transplant recipients.

There are limited data on development of dnDSAs and graft dysfunction and allograft failure. We aim to understand the development of allograft dysfunction and failure in children who develop dnDSAs.

Method:

10-year retrospective observational review was carried out for all the children (<18 years of age) who underwent kidney transplantation at a tertiary centre. Data were collected through electronic patient records and included patient demographics, donor and recipient characteristics and post-transplant course including rejection episodes, dnDSA surveillance, progression of eGFR and immunosuppression changes.

Results:

Preliminary analysis identified 46 children (20 female and 26 Males) who had a kidney transplant at a mean age of 10 years (SD 4.8). Median follow-up time was 3 years (IQR:2).

10 patients (22%) developed dsDSAs, 27 patients (58%) did not develop any dsDSAs throughout their follow-up and 9 patients were excluded as no data on dnDSAs were available.

60% (6/10) of patients in dsDNA group had a decline in eGFR to a mean 30ml/min/1.73m^2(SD 18), whereas 40% (5 /27) of children with no DSAs developed a mean eGFR of 35 ml/min/1.73m^2 (SD 13) over the follow-up period (p= 0.2).

Biopsy proven rejection episodes were noted more in the dnDSA group as compared to no dnDSA group (30% vs 18%, p value:0.08).

Discussion:

Our interim analysis did not find any statistically significant difference in the eGFRs of children with kidney allografts who developed dnDSA and those who did not at the last follow-up. This study is the first step towards understanding this cohort and developing future directions in research to understand kidney allograft failure.

		Follow-Up		3 months	6 months	1Year	2 Year	3 Year	4 Year
Total (46)	Developed dnDSA (10)	eGFR**	<50	3	1	2	2	2	1
			50-90	1	1	0	1	3	1
			>90	0	0	0	1	0	0
		Viremia***	Yes	2	1	1	4	3	1
			No	2	1	1	0	2	1
		Rejections	Number	1	0	1	1	0	0
		Proteinuria	Yes	2	1	0	2	2	1
			No	0	0	0	0	1	0
	No dnDSAs Developed (27)	eGFR	<50	9	9	8	10	9	4
			50-90	10	15	10	14	12	8
			>90	16	12	19	6	3	4
		Viremia	Yes	19	16	27	22	19	11
			No	16	20	10	8	5	4
			1	1	1	1	0	0	0
			≥2	0	1	0	0	0	0
		Rejection	1	1	1	1	0	0	0
			≥2	0	1	0	0	0	0
		proteinuria	Yes	10	13	12	16	13	9
			No	2	0	1	1	1	1

**eGFR ml/min/1.73m^2

*** includes EBV,CMV,BK and JK

Poster number: 252

Submission number: 373

Pyloric stenosis in an infant with congenital nephrotic syndrome

Dr Kathryn Mullan

Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland

Dr Kathryn Mullan

Biography
I am paediatric trainee with an interest in paediatric nephrology and medical education.

Abstract

INTRODUCTION: Infants with congenital nephrotic syndrome (CNS) often have issues with vomiting and feed intolerance [1]. Faltering growth is a common complication inherent to the condition and remains one of the greatest challenges in management. Potential causes include increased energy requirements, malabsorption, and vomiting due to physiological causes, gastroesophageal reflux, hypoperistalsis or uraemia in kidney failure [2]. International consensus guidelines advocate for a multidisciplinary assessment in a specialised paediatric nephrology unit, with an individualised approach to achieve early nutritional optimisation [3]. We present a case of hypertrophic pyloric stenosis (HPS) as an uncommon cause of vomiting in an infant with CNS. Our aim was to determine the incidence, natural history and potential association of HPS in CNS.

An 8-week-old Caucasian female infant born to non-consanguineous parents presented with feeding difficulty, abdominal swelling and oedema. Hypoalbuminaemia and heavy proteinuria confirmed a diagnosis of CNS. Due to weight loss and persistent vomiting in the weeks following diagnosis in the setting of normal biochemical and renal parameters, a GI contrast study was performed. It identified complete gastric outlet obstruction, raising the suspicion of HPS, confirmed on ultrasound imaging and at surgery. A pyloromyotomy was performed with subsequent weight gain.

METHODS: We performed a review of the literature following the PRISMA guidelines in patients with CNS since it was first reported in 1942 until present. In MEDLINE and EMBASE, search terms "hypertrophic pyloric stenosis", "gastric outlet obstruction", and "congenital nephrotic syndrome" identified studies reporting cases of HPS in infants with non-infectious CNS in abstracts or full manuscripts (n = 3). We evaluated data from the UK (1988), Asia (2016) and North America (1953-1982) [2,4,5].

RESULTS: From these studies, eight cases were identified over the last century (1953–2016). Mahan et al. reported that 5 of 41 CNS infants had HPS [4]. Clinical manifestations ranged from classic presentations to a delayed insidious onset. Management varied from the widely accepted Ramstedt pyloromyotomy to emergent pyloroplasty.

DISCUSSION: Northern Ireland and Finland report a significantly higher incidence of CNS than the worldwide average, at 8 & 12 per 1,000 live births, respectively [6]. The incidence of HPS ranges

between 0.2-0.4% of live births in these nations [7]. Despite heterogeneity, the literature reports a substantial proportion, as many as 12%, with HPS in this condition [4]. The reason for a 100-fold increase in HPS incidence in CNS remains unclear. While it seems less likely the dual pathologies occurred by chance phenomenon alone, any possible association would warrant further investigation. The polygenic overlap at shared genetic loci incurring 'genetic liability' and oedematous mucosal layers at the pyloric antrum are two hypotheses which may offer biological plausibility to any potential association [2,8-10].

Given the benefits associated with early surgical repair, we propose a lower threshold for considering HPS as a differential in the vomiting infant with CNS. Prompt diagnosis avoids delays in early nutritional optimisation for growth in preparation for transplantation. Future studies should focus on determining the incidence and potential association of PS in CNS in prevalent countries.

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Renal death in children on kidney replacement therapy

<u>Dr Lucy Plumb</u>[1,2], Dr Retha Steenkamp[1], Prof James Medcalf[1,3,4], Prof Dorothea Nitsch[1,5,6]

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Dr Lucy Plumb

Biography

I am interested in the epidemiology of childhood chronic kidney disease, in inequalities in access to kidney services and best practice care, and use of mixed-methods research to address research questions important to children with kidney disease and their families. My NIHR Doctoral Research Fellowship focused on understanding the problem of late presentation of chronic kidney disease in childhood: to understand factors associated with late presentation, symptom predictors of advanced kidney disease, and the lived experience of the pathway to diagnosis for late presenting children and their families. In my post-doctoral work, I will use healthcare data to determine whether children at risk of develop chronic kidney disease and kidney failure can be identified from healthcare interactions. My aim is to reduce the burden of late presentation of chronic kidney disease and develop interventions which support timelier diagnosis of kidney disease in children, to improve long-term outcomes. Outside of the University, I am the Paediatric Research Lead for the UK Renal Registry and a member of the UK Kidney Association Paediatric Supportive Care Specialist Interest Group.

Abstract

Introduction

Limited information is available regarding the causes of death for children on kidney replacement therapy (KRT). In the UK, data are not regularly reported due to a high proportion of missing data (37.4%) and small numbers of child deaths annually. This study aims to report for the first time the causes of death for children receiving KRT in England and Wales captured by the UK Renal Registry (UKRR) and compare this to information from Civil Registration (CR) records.

Methods

Children aged ≤18 years, receiving KRT between January 01, 2001, to Dec 31, 2021, in England and Wales were included in the study. Causes of death reported by nephrology centres to the UKRR were compared with the primary cause of death (ICD-10 codes) from CR records. The kappa statistic was used to compare agreement between UKRR and CR cause of death and chi-squared tests examined frequency differences between groups. Causes of death were analysed by age group, sex, and treatment modality.

Results

During the study period, 2,657 children received KRT in England and Wales. The UKRR identified 294 deaths, with 62.6% having a cause of death reported. CR records showed 292 deaths with 98.3% having a cause of death listed. Dates and number of deaths agreed very well between datasets: the UKRR had 9 deaths not in CR records and CR had 7 deaths not recorded in UKRR records. Cause of death kappa agreement was substantial for malignancy (0.70), moderate for cerebrovascular disease (0.43) and fair to slight for cardiac disease, infection, and other causes (0.06-0.19).

In UKRR records, 25.5% of deaths were due to infection, 10.9% from cardiac disease, 10.9% from malignancy, 10.3% treatment withdrawal and 29.9% due to other causes of death (table 1). In CR records, the majority of deaths were due to genitourinary conditions (21.3%), congenital anomalies (15.3%), malignancy (11.9%), metabolic disorders (9.8%), cardiovascular disease and endocrine conditions (figure 1).

For those with missing cause of death or death due to treatment withdrawal in the UKRR, civil registration records suggested deaths were predominantly due to genitourinary, congenital or endocrine conditions (figures 2 and 3).

No differences were found between cause of death by age group, sex or treatment modality in UKRR records, but differences in cause of death by treatment modality were seen among civil registration records. Deaths due to malignancy were more frequent (17.1%) in transplanted children compared to those on dialysis (15.6%), while infections were more frequent for children on dialysis (43.9%) compared to transplanted children (6.2%).

Discussion

This is the first study to examine, in detail, causes of death for a national cohort of children receiving KRT from two robust data sources. Infection and cardiac disease are common among children receiving KRT, with malignancy more frequent than previously reported, particularly among transplant recipients. Frequency counts and timing of deaths are similar in both datasets although agreements between causes of death were variable. While UKRR data suggests more granular information regarding cause of death, data completeness limits its epidemiological use.

Table 1 Causes of death in paediatric patients prevalent in 2001-2021, data from the UKRR

Causes of Death	Number	%
Cardiac disease	20	10.9
Cerebrovascular disease	8	4.4
Infection	47	25.5
Malignancy	20	10.9
Treatment withdrawal	19	10.3
Other	55	29.9
Uncertain aetiology	15	8.2
Total	**184**	**100.0**
Missing	110	37.4

Figure 1 Civil Registrations Causes of Death for study cohort
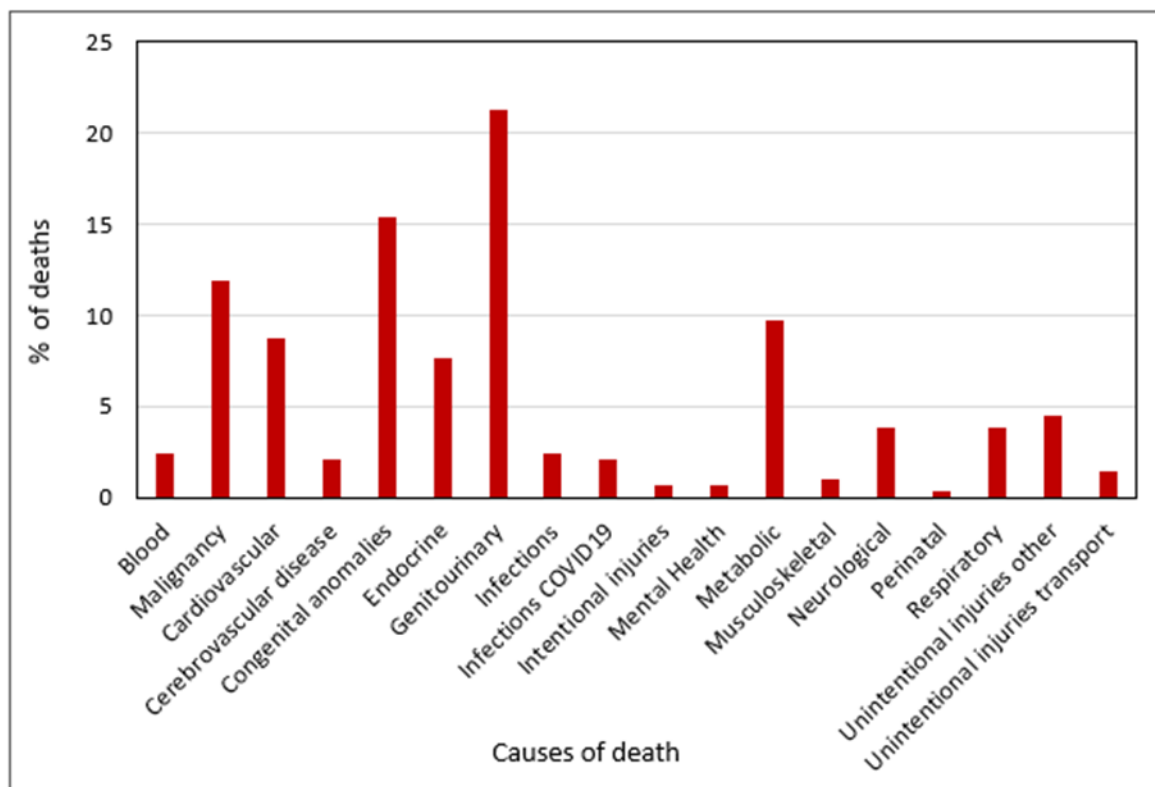
Figure 2 Causes of death captured by civil registration records for children with missing causes of death in UKRR records
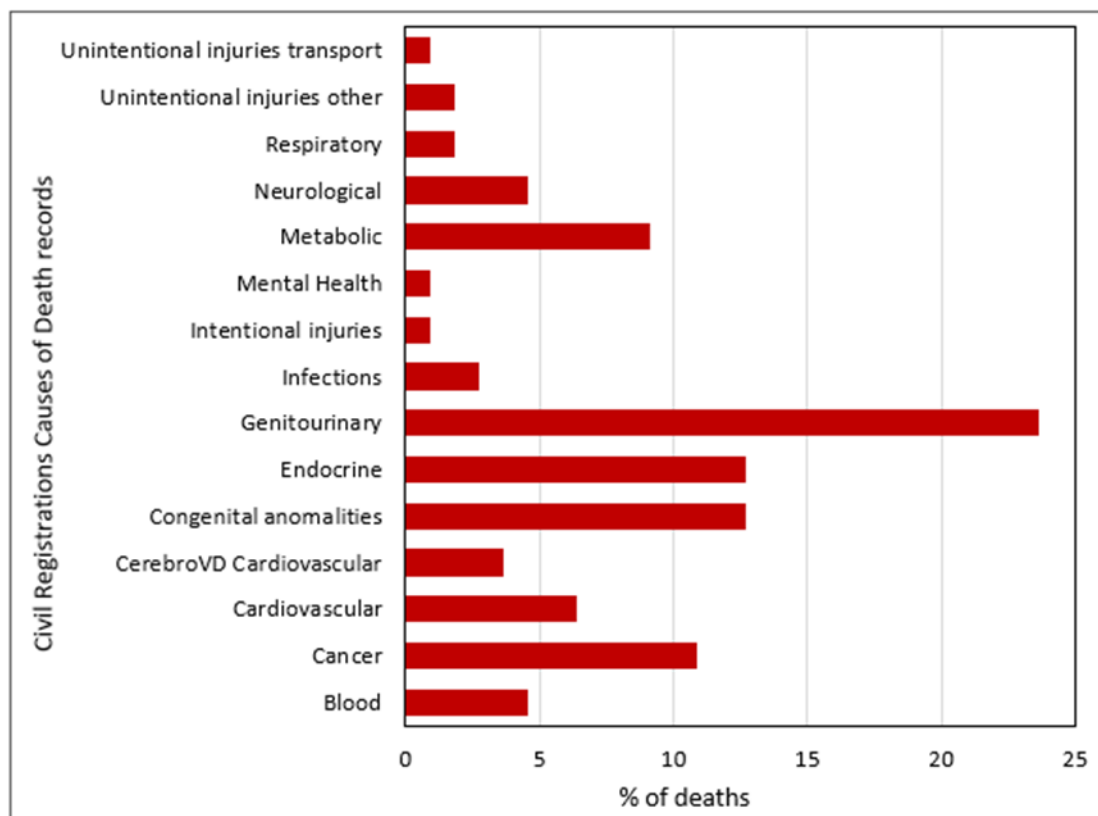
Figure 3 Causes of death captured by civil registration records for children with treatment withdrawal listed as cause of death in UKRR records
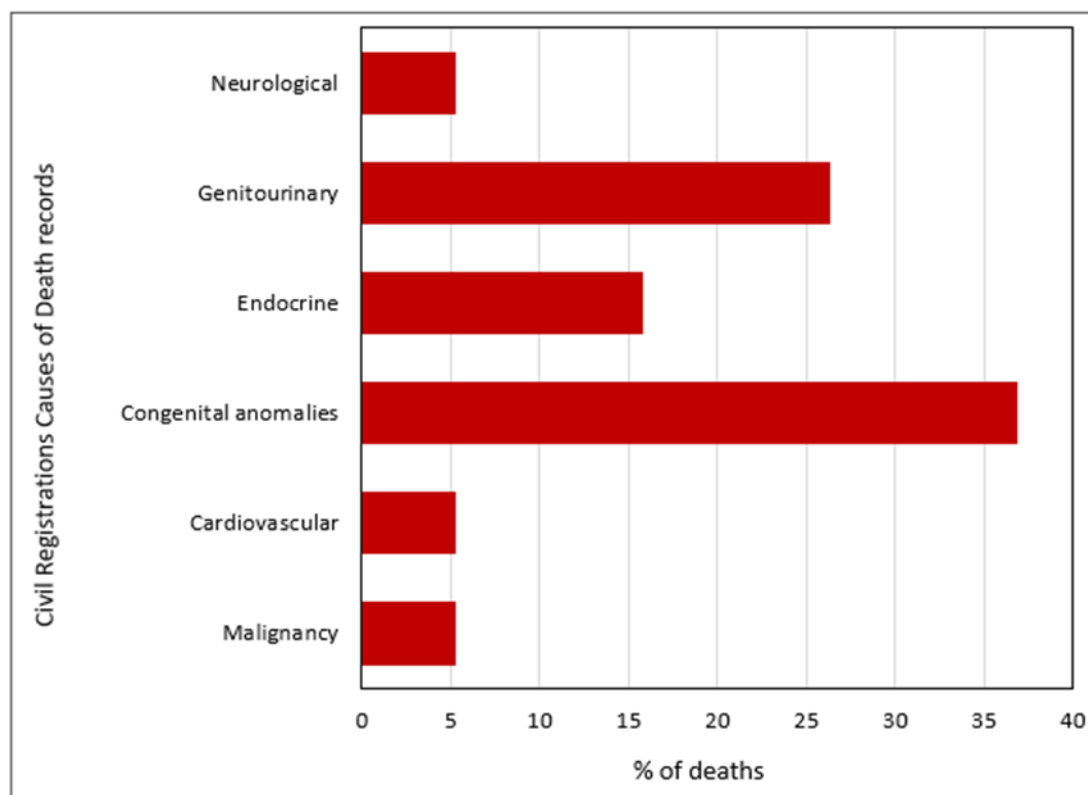
Poster number: 254

Submission number: 536

Survey of London Renal Trainees on their experience of managing young people with renal disease

Dr Michelle Allan[1,2], Ms Nicola Cunningham[1], Dr Refik Gokmen[1,3], Dr Joyce Popoola[1,4]

[1]London Kidney Network, London. [2]Barts Health NHS Trust, London. [3]Guy's and St Thomas' NHS Foundation Trust, London. [4]St George's University Hospital NHS Foundation Trust, London

Dr Michelle Allan

Biography
Michelle Allan is an ST5 renal trainee in North London and the trainee representative on the London Kidney Network Young Adult Workstream working group.

Abstract

The transition between paediatric and adult services is a crucial period in the lives of young patients with far-reaching consequences on their long-term physical and mental health and quality of life.

The London Kidney Network Young Adult Workstream was established in December 2021 to define good care for this transition period and examine the experiences and service pathways of people aged 16-29 with renal conditions.

To improve present and future care, we wanted to quantify the current London trainee understanding of transition, to effectively target future training and education resources.

A subgroup consisting of a renal trainee and consultant, a young adult affected by renal disease and a project manager designed a trainee questionnaire. It adapted a published American questionnaire to fit UK practice and finalised the 22-item electronic survey following feedback from the Workstream.[1] The survey was uploaded to Smartsurvey, an online questionnaire platform and circulated via Health Education England (London) to the pan-London cohort of 90 renal trainees in August 2022.

Following monthly reminders, the survey closed in November 2022 with a 20% response rate. Of these, 75% were from North London and 50% had 2-4 years of training.

All respondents had at least quarterly contact with a young adult aged 16-29 with renal disease but had limited confidence speaking with patients across all modalities of renal medicine. Trainees reported especially low confidence discussing body health, family planning, and the psychosociosexual consequences of renal disease.

Whilst all respondents agreed that physicians have a responsibility to prepare young adults for transition, 60% felt that young adults were not adequately prepared and only 1 respondent felt equipped to manage kidney disease in young adults. Only 30% had experienced any form of formal training or role-modelling and 83% felt there was insufficient education on this topic. Only 30% felt they would engage with online learning: there was a preference for experiential learning, e.g. clinic attendance at paediatric/tertiary units following by training explicitly devoted to working with young people.

In summary, London renal trainees feel underequipped and lack confidence providing care to young adults with renal disease, despite frequent clinical exposure. However, they recognise their limitations and are keen to gain further training and experience. The limitations of this project include the low response rate and potential respondent bias; similarly, the majority of respondents were from North London so it is not possible to generalise our findings.

We delivered a North London Deanery training day on transition and young adult medicine which was well received in formal feedback. We presented our findings to the North London Training Program Directors and hope to develop training packages to meet the needs of the trainees: we intend to repeat the survey after these interventions. We would be interested to learn of any other UK deanery experience in this area.

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Study Registration Number (e.g. ClinicalTrials.gov, EudraCT, PROSPERO)

Registered Audit ID Barts Health NHS Trust 13747

Poster number: 255

Submission number: 583

Estimated GFR with Creatinine and Cystatin C in clinical practice: a single centre study

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Dr Natasha Su Lynn Ng

Biography

Paediatric Nephrology ST7 Grid trainee based in Alder Hey Children's Hospital

Abstract

Introduction

Accurate estimation of glomerular filtration rate (eGFR) in children is important both for use in clinical practice and as a reliable measure of kidney function for clinical trials. Serum creatinine is widely used as a filtration marker, however, it can be influenced by age, sex, pubertal status and muscle mass [1]. Cystatin C-based measurements are thought to improve the accuracy of creatinine-based GFR estimates however modified CKiDU25 formula has demonstrated strong performance [2]. This study aimed to examine the relationship between different measurements of GFR in a real-world setting.

Methods

This study was a retrospective, single-centre, cross-sectional study that took place at Alder Hey Children's Hospital, Liverpool from January 2019 to October 2023. Children aged 1-18 years who had Cystatin C measurements obtained for clinical purposes were included. Demographic data and values obtained on corresponding creatinine, height and formal GFR values. Comparisons were made between creatinine-based GFR and cystatin C-based GFR estimates.

Results

A total of 254 (Male 193, 76%) patients with median age 10 (IQR6;15) were identified. Creatinine-based GFR estimates were calculated in 187/254 patients and cystatin C-based GFR estimates were calculated in 247/254 patients. 11/254 patients had formal GFR measurements recorded. For the overall cohort (n=187), Spearman's rank correlation showed good association between creatinine-based GFR and cystatin C-based GFR estimates (r=0.73, p<0.001). The association was strongest in the age groups <2 years (n=14) (r=0.86, p<0.001) compared to age groups 2-11 years (n=91) (r=0.68, p<0.001) and age groups >11 years (n=82) (r=0.65, p=<0.001). A good association was also demonstrated between formal

GFR measurements and cystatin C-based GFR estimates (r=0.70, p=0.002). In comparison, relationship between formal GFR measurements and creatinine-based GFR estimates was not significant (r=0.11, p=0.750). Formal GFR had a better association with average GFR estimates between creatinine and cystatin C measurements (r=0.77, p=0.005).

Discussion

There was a strong correlation between the estimated GFR using cystatin C and creatinine based CKiDU25 formula that did not differ according to age. The use of creatinine based CKiDU25 estimates appear to be reliable and likely to be the most suitable for everyday use. Cystatin C-based GFR estimate is superior for children with low muscle mass.

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Poster number: 256 - WITHDRAWN

Poster number: 257

Submission number: 101

Frailty in patients on haemodialysis: prevalence and correlation with nutritional status

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Ms Meghan Borg

Biography
Meghan Borg qualified as a dietitian (BSc & PGDip) in 2019 and successfully obtained a MSc in Advanced Dietetic Practice at the University of Nottingham in 2020. She worked as a dietitian in a large acute hospital for 2 years and became a specialist renal dietitian in 2022 at Nottingham University Hospitals (NUH) Trust. Meghan successfully completed the Chief Allied Health Professional Fellowship in 2023 where she focused on frailty in patients on haemodialysis at NUH and satellite dialysis units, specifically investigating the prevalence and correlation with nutritional status. Meghan has a strong interest in research and is currently completing the pre-doctoral programme in the University of Nottingham, while working full-time as a specialist renal dietitian at the Nottingham University Hospitals Trust.

Abstract

Introduction

Frailty is a common condition in chronic kidney disease (Cobo, Lindholm, Stenvinkel, 2018). Inadequate nutrition is an important predisposing factor to frailty (Liang et al., 2021), however, there are limited studies investigating nutrition and frailty in people on maintenance haemodialysis (MHD). A service evaluation was conducted to estimate the prevalence of frailty and to assess correlations between nutritional status and frailty in patients on MHD.

Methods

Clinical Frailty Scale (CFS) scores were collected from 85 patients aged ≥ 65 years on MHD. Dry body weight, body mass index (BMI), handgrip strength (HGS), 7-point subjective global assessment (SGA) and the number of admissions over two years were collected from 18 out of the 85 patients. Two-day food diaries were analysed from 15 out of the 18 patients using Dietplan7 nutrition analysis programme.

Results

66 out of 85 MHD patients were living with frailty, with a median CFS of 5 (mild frailty). Two significant negative correlations were found between CFS and HGS (r_s=-0.4918; p=0.04) and CFS and dietary

phosphate intake (r_s=-0.62942; p=0.01). Positive correlations between CFS and BMI, age, number of admissions and dietary potassium intake and negative correlations between CFS and SGA, dietary intake were found, however these failed to achieve statistical significance, likely due to the small cohort.

Discussion

Frailty is prevalent amongst ≥ 65 year old patients on MHD and this service evaluation highlights the importance of using CFS as part of renal dietetic practice. It is difficult to draw conclusions due to the small sample size, however results support the theory that malnutrition is correlated to frailty. More studies are required to investigate the effect of nutrition on frailty status in elderly MHD patients.

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Poster number: 258

Submission number: 101

Personalised meal planning for potassium and phosphate control in a haemodialysis patient: a case study

Mr Giuseppe Scapellato

St George's University Hospitals NHS Foundation Trust, London

Mr Giuseppe Scapellato

Biography
Specialist Renal Dietitian at St George's University Hospitals NHS Foundation Trust. Special interest in research in renal dietetics including bone health and phosphate additives in food products, indirect calorimetry and energy requirements in CKD patients.

Abstract

Introduction:

A 57-year-old male, independent of daily activities and undergoing haemodialysis for the past four years, experienced persistent hyperkalaemia and hyperphosphatemia despite regular dietary education and treatment with phosphate binders. The patient was not taking any medications known to cause potassium release from muscles (such as statins or ACE inhibitors) and had no diagnosis of diabetes.

The patient had a BMI of 27.4 kg/m2 and a history of nearly anuric status. In February 2023, his pre-dialysis potassium and phosphate levels were notably elevated at 7.2 mmol/L and 2.78 mmol/L, respectively. The patient was also using calcium acetate as phosphate binders and reported irregular bowel movements, classified as a type 2 Bristol stool chart.

Methods:

Patient received training on how to use Kidney Care Kitchen recipe database and low-potassium low phosphate recipes were recommended, aiming to limit daily potassium intake to 2700 -3000 mg/day1 and restrict phosphorus intake to 800-1000 mg/day2. Emphasis was placed on high-fibre foods to support regular bowel movements and potassium excretion through stools.

Results:

Following implementation of the recipes, the patient reported a significant improvement in his pre-dialysis potassium levels which dropped to 6.1 mmol/L and phosphate levels decreased to 1.7 mmol/L. Notably, the patient reported daily bowel movements and expressed satisfaction with the recipes.

Discussion:

This case study underscores the effectiveness of recipes provision in controlling potassium and phosphate levels in a haemodialysis patient with persistent hyperkalaemia and hyperphosphatemia. The focus on restricting potassium and phosphorus intake while promoting high-fibre foods contributed to improved biochemical parameters and regular bowel habits. Dietary phosphorus in wholegrain products exceeds that found in their refined counterparts. Nonetheless, phosphorus in plant-based sources is bound to phytates, resulting in reduced bioavailability, estimated to be less than 40% as human bodies lack the enzyme phytase necessary to break down phytates 3.

The findings emphasize the importance of individualized dietary management strategies in patients undergoing haemodialysis to mitigate electrolyte imbalances.

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Biography: Specialist Renal Dietitian at St George's University Hospitals NHS Foundation Trust. Special interest in research in renal dietetics including bone health and phosphate additives in food products, indirect calorimetry and energy requirements in CKD patients.

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Poster number: 259

Submission number: 226

A targeted and pragmatic dietary potassium supplementation strategy to manage persistent hypokalemia in patients on maintenance hemodialysis

<u>Dr Mohamed Wazeer Mohamed Buhary</u>[1,2], Dietitian Manar Kadah[3], Dr Fahad Syad[3]

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Dr Mohamed Wazeer Mohamed Buhary

Biography
I graduated with MBBS in 2002. I completed my Senior House Officer training in General Medicine and received my MRCP in 2006. I completed my Registrar training in General Medicine and Renal Medicine with MRCP (Renal) and CCT in 2012. I was appointed as a Consultant in Renal Medicine in 2012 and have been practising to date. Currently, I work as a Medical Director for Hemodialysis. My Interests are; Dialysis, Acute Kidney Injury and Critical Nephrology. I am an enthusiast in Medical Education and hold an Adjuvant Assistant Professor role in a leading medical school. I also take an active role in teaching and training Renal Registrars.

Abstract

INTRODUCTION:

Patients undergoing hemodialysis are at increased risk of cardiac arrhythmias. This has been closely associated with both high as well as low pre-dialysis potassium (K) levels. The UK Kidney Association (UKKA) guidelines recommend maintaining potassium levels between 4 - 6 mEq/L and there are several accompanying guidelines to maintain K below 6 mEq/L. However, there are currently no guidelines on how to intervene when pre-dialysis K remain consistently below 4 mEq/L. Conventionally, these patients are switched to dialysate with K bath of 3 mmol/L along with advice to consume potassium-rich dietary supplements. However, generic dietary advice often fails due to noncompliance among hemodialysis patients. To address this, we developed a new targeted dietary potassium supplementation strategy using bananas. The goal of this intervention was to maintain mid-monthly pre-dialysis potassium levels within the range of 4 - 6 mEq/L, particularly in those who had persistent pre-dialysis K below 4 mEq/L, despite the conventional treatment. Bananas, which contain 20 mmol of K in a single serving of 200g, are known to increase serum K levels within 30-60 minutes of ingestion due to their sustained gastric emptying.

Method:

This was a retrospective single-centre audit study. The goal of the study was to assess the effectiveness of this targeted dietary potassium supplementation in maintaining the K within the desired range. The study enrolled adult hemodialysis patients who were aged over 18 years and had monthly pre-dialysis K

of less than 4 mEq/L for three consecutive months despite conventional treatment strategies. Patients suspected of having potassium-losing tubulopathy, low serum magnesium levels or chronic diarrhoea were excluded from the study.

All participants were already on K3 dialysate along with potassium-rich dietary supplements as per conventional practice. Additionally, all participants were given a portion of banana (200g/ 20mmol) right before every dialysis, three times a week for three months. The pre-dialysis potassium levels were monitored every mid-month by laboratory testing.

Results:

30 patients met the inclusion criteria. During the 3-month follow-up period, 80% of all participants who took the banana-based targeted dietary supplement three times a week were able to achieve and sustain their pre-dialysis K levels above 4 mEq/L without experiencing hyperkalemia. All patients reported that the regime was palatable and targeted and, hence, was easy to follow and comply. The graph below illustrates the changes in patients' median K levels before and after the intervention.

Discussion:

The initial short-term outcome of our intervention was encouragingly safe and cost-effective; however, further validation is needed before stronger conclusions can be drawn about the long-term efficacy and safety of targeted potassium replacement with bananas. Our study certainly had some limitations, including potential confounding factors such as malnutrition and inflammation. Moreover, the portions of bananas administered were not tailored to the participants' BMI (Body Mass Index). Nevertheless, despite the limitations, the findings have important implications for maintaining pre-dialysis potassium levels within the recommended range.
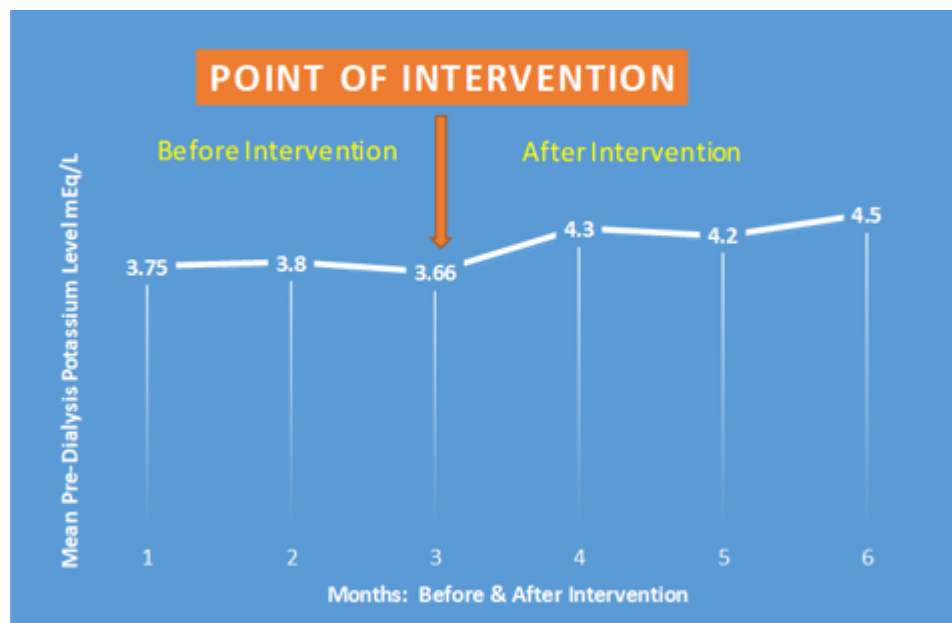
Poster number: 260

Submission number: 288

Hypokalaemia is common in those receiving peritoneal dialysis, improvements in recognition and management are needed.

Ms Katie Durman, Dr David Randall, Dr Stanley Fan

Barts Health NHS Trust, London

Ms Katie Durman

Biography
I have held the position of Clinical Lead Renal Dietitian at Barts Health NHS Trust for the past 17 years. During this time, I have led the renal dietetic renal team and have worked in all areas of renal dietetics, currently specializing in dietetic management of those on peritoneal dialysis. I hold the position of guidelines lead on the Renal Nutrition Group of the British Dietetic Association. I was part of the dietetic group who updated UKKA Multi-professional Renal Workforce Plan for Adults and Children with Kidney Disease and am currently part of the multi-professional group writing the UKKA Hypertension in Dialysis guideline. For the past 3 years I have been working part time with the London Kidney Network as one of the multi-professional leads. This has been a fantastic opportunity to work across London to support the implementation of the RSTP and GIRTH and improve the outcomes for those with CKD. I have been working the home therapies workstream leading on workforce and training and leading the wider nursing group whilst a nursing lead is appointed.

Abstract

Introduction
Hypokalaemia is associated with increased mortality and peritonitis in those receiving peritoneal dialysis (PD). Our unit noted that low potassium levels were often seen. Despite dietary advice patients were frequently reluctant to abandon previous low potassium diets.

We aimed to investigate the extent of hypokalaemia it's management and explore if hyperkalaemia is a risk in our population.

Methods

For patients who were receiving PD as of March 2023 the maximum and minimum potassium levels were extracted from our electronic data system (routine blood tests are done every 2-3 months). The notes were reviewed for those with a maximum potassium greater than 5.5mmol/l or minimum potassium less than 3.5mmol/l to investigate reasons for abnormal potassium and in the case of hypokalaemia what actions were taken and the outcome.

Results

Two hundred and twenty-five patients were receiving PD, age range 17 to 88 years and 128 (57%) were male. Eighty-three patients (37%) were receiving CAPD, and 142 (63%) APD. Duration of PD was 12 days to 12 years.

The range of the lowest potassium was 2.2-3.4 mmol/l. Fifty-eight patients (26%) had a potassium less than 3.5mmol/l, 18 patients (8%) experienced severe hypokalaemia, potassium less than 3mmol/l.

The range of the highest potassium was 5.6 – 7.8mmol/l. Fifty patients (22%) had potassium greater than 5.5mmol/l. Five patients (2%) had severe hyperkalaemia, potassium 7mmol/l or greater and 25 (11%) moderate hyperkalaemia, potassium 6 - 6.9mmol/l.

Thirty-two hyperkalaemic patients were under dialyzed, 3 were constipated and for 15 patients the cause was not obvious from the notes. Of these 15 patients, 12 only had one high potassium, 2 of the remaining 3 were inpatients. Everyone with a potassium of 7 or more was under dialyzed.

Of the 58 patients with low potassium 11 had one low potassium. Eighteen patients only experienced low potassium levels when in hospital. Of the remaining 40 patients, 21 received specific dietary advice to increase potassium, this is in addition to initial dietetic advice that there is no need to limit foods high in potassium.   Potassium levels increased in 10 patients after advice, 2 patients had not had a repeat measurement. One patient was prescribed potassium supplements as an outpatient, and one was admitted and required IV potassium.

Twenty-two of the 58 patients with a low potassium had a poor appetite documented in the notes and 11 of these were prescribed nutritional supplements. The notes of 4 patients indicated they were eating well. For 32 patients it was not clear how their appetite was.

Discussion

Hypokalaemia is a frequent occurrence in our PD population with 58 patients (26%) having at least one episode and for 18 patients (8%) this hypokalaemia was severe (<3mmol/l).   If adequately dialyzed hyperkalaemia is rarely a problem.

More needs to be done to identify hypokalaemia and give appropriate dietary advice, only half of the patients were referred to the dietitian. Dietary advice alone was insufficient to increase potassium levels for half of the patients. Dietary education and strategies need to be reviewed and other management strategies considered.

Poster number: 261

Submission number: 301

Developing a South Asian recipe magazine for renal patients

Mrs Amita Godse

Freeman hospital Newcastle upon Tyne, NHS Trust, Newcastle upon Tyne

Mrs Amita Godse

Biography
Amita Godse is a registered dietitian working within the NHS as a renal dietician for the past 10 years. Along with her expertise in renal dietetics she also specialises as a diabetes dietitian. She is qualified as a supplementary prescriber and currently leading the development of dietetic service for post renal transplant diabetes management within her trust. Combining her passion for cooking with dietetic knowledge, she is enjoying working for the Kidney care UK- as the Kidney Kitchen dietitian.

Abstract

Introduction: Asian ethnic groups make up the second largest percentage of the UK population (9.3%)[1]. Statics show that people with South Asian (SA) origin are at a higher risk of developing diabetes, hypertension, cholesterol, and cardiovascular problems. Poorly controlled diabetes and blood pressure can lead to chronic kidney disease (CKD) and even End-stage renal disease (ESRD)[2]. It is therefore important that SA patients get culturally appropriate dietary advice. This can become challenging considering the diversity of SA cuisine. A UK based kidney patient charity identified this challenge and along with British dietetic association- Renal nutrition group (BDA-RNG) took the initiative of developing a recipe magazine to support South Asian patients with CKD.

Method: A team comprising of the project lead, a lead renal dietitian of SA origin, a chef, an administrator, a food stylist, and a photographer worked together along with the dietitians in RNG to develop the magazine.

20 SA recipes were selected for analysis. These included staple dishes from different parts of India, Pakistan, and Bangladesh. Each recipe was analysed using an online food analysis software. The analysis was checked against per portion parameters for potassium, phosphate, protein, fat and salt agreed by the RNG as below.

Protein	≥30g high protein main meal
	<20g low protein main meal
	<6g for dessert
	<12g for breakfast
	<12g low protein light meal
Low Phosphate	<400mg for main meal
	<480mg plant based main meal
	<65mg for dessert
	<400mg for breakfast (must include 200ml of milk allowance)
	<200mg light meal
Low Potassium	<1000mg for main meal
	<312mg for desserts
	<390mg for breakfast with no fruit/vegetables
	<550mg for breakfast with 80g portion fruit/vegetables
	<500mg light meal
Everyday parameters	≤17.5g fat per 100g
	≤0.7g salt per 100g
	Not suitable for desserts/puddings/sweet snacks

Changes to the recipes were made by the lead dietitian to fit the nutritional parameters making the recipes culturally acceptable and suitable for CKD patients.

Recipes, nutritional analysis and food facts were submitted to the RNG for approval using a standardised recipe template.

Result: 19 popular south Asian recipes and 1 recipe for a basic curry sauce were selected and approved by the RNG. Recipes were divided into 5 breakfast dishes, 10 main meals and 4 desserts.

All recipes were analysed as low in potassium, phosphate, saturated fat, and salt. 50% of the recipes for main meal and breakfast were vegetarian. Out of the 19 recipes, 5 were low in protein, 6 were high in protein and 8 recipes provided as source of protein.

The recipes were cooked, photographed, and published in the SA recipe magazine, January 2024 along with a supporting article about South Asian foods for people with CKD.

Discussion: The magazine is a culturally appropriate dietary resource for the growing SA population in the UK. It includes commonly used SA cooking methods, ingredients and serving styles. Cooking methods to reduce potassium, eg boiling is uncommon for SA cooking and may not suit most recipes. The magazine demonstrates the use of more common SA cooking methods like pressure cooking, pan frying and stir frying keeping the recipes low in potassium. SA diets can be high in salt. The modified recipes have more spices and herbs adding flavour to compensate for reduction in salt. The supporting article gives further tips on reducing salt. This magazine will be available free of cost to the patients and will provide as a wonderful resource for all CKD patients who are looking for variety and flavours in their diet.

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UV spectrophotometric analysis of phosphate content in plant-based milk alternatives.

Ms Alison Lyles[1], Ms Estere Sture[2], Mr Ross Walker[2]

[1]NHS Lothian, Edinburgh. [2]N/a, N/a

Ms Alison Lyles

Biography

After graduating with a BSc (hons) in Pharmacology from Edinburgh University, I continued my training, obtaining MSc in Dietetics from Queen Margaret University in 2007. Since then, I have worked in acute adult dietetics in a variety of clinical specialty areas including: care of the elderly, general surgery, gastroenterology and oncology. Latterly, this has focused on dietetics within the area of Renal Medicine. This is a complex area of dietetic practice which incorporates chronic disease management alongside behavioural change skills to educate and empower patients and their carers to make appropriate dietary modifications whilst ensuring nutritional adequacy. Currently, I work as a lecturer in Nutrition & Dietetics at Queen Maragaret University and lead the MSc (pre-reg) programme in Dietetics. Research interests are diverse but focus on weight management and dietary phosphate management approaches in Renal disease.

Abstract

Introduction: Restriction of dietary phosphate is a major aspect of patient care in those with advanced renal disease due to the necessity to control for phosphate balance and to minimise risks of disturbances in bone and mineral metabolism and cardiovascular events associated with vascular calcification. Traditional cow's milk is often restricted in the renal diet in an attempt to reduce dietary phosphate and with increasing popularity of plant-based diets, non-dairy milk alternatives have been proposed as a potential alternative in terms of reducing dietary phosphate load due their naturally lower organic phosphate content1. However, the extra amount of phosphate which is consumed as a result of phosphate-containing food additives in these products is currently unknown.
This represents a challenge for renal dietary education as it represents a "hidden" phosphate load which is difficult to quantify2. The aim of this study was to measure and differentiate the total phosphate content of a range of plant-based milk alternatives commonly consumed in the UK which do or do not contain phosphate additives. Furthermore, phosphate content was also expressed as phosphate to protein ratio in order evaluate phosphate alongside protein content. For reference on average a mixed diet which contains 12-16mg of phosphate per gram of protein is considered a low phosphate diet3. Results were also compared to previously documented food composition data
for cows milk4. Methods: A total of 14 plant-based milk alternatives (from 7 different plant sources each with and without listed phosphate-additives) were selected and purchased from a common grocery store in the UK. Foods with phosphate additives were recognised by wording "tri-calcium phosphate, dipotassium phosphate or monopotassium phosphate" or by the initials E340-E341 on the

food label ingredients list. Phosphate content was determined by the molybdenum blue reaction and measured by UV spectrophotometry using methods previously described[5]. Determination of total phosphorus was carried out in triplicate for each sample. Phosphorus concentration was expressed as mg/100g and as well as phosphorus to protein ratio (PPR) in order to make comparisons between milks. Comparisons between groups of milks with and without phosphate additives were made via appropriate non-parametric statistical testing. Results: Overall results showed plant-based milks with phosphate additives had on average had significantly more phosphate thank those without (59mg/100g vs 5mg/100g respectively; $p<0.001$). Figure 1 shows concentrations of phosphate in each milk sampled by brand and type alongside the corresponding PPR. For comparison, phosphate content in cows' milk in the UK is on average 95mg/100g with a PPR 27mg/g4.

Phosphate additive containing			Non phosphate additive containing		
Milk type & brand	Phosphate (mg/100g)	PPR (mg/g)	Milk type & brand	Phosphate (mg/100g)	PPR (mg/g)
Alpro soy original	101	31	Alpro soya organic	8	2
Alro coconut original	57	568	Alpro coconut organic	2	24
Alpro oat original	59	195	Plenish organic oat	3	6
Alpro almond original	55	139	Alpro almond organic	5	10
Alpro hazelnut original	58	146	Plenish Hazelnut	15	24
Alpro rice original	18	185	Rice dream organic	3	30
Alpro cashew original	61	122	Plenish cashew	16	18

Figure 1: Phosphate and phosphate:protein ratio (PPR) of plant-based milks sampled.

Discussion: Overall phosphate content analysis shows that plant-based milks with phosphate additives have around 8 times more phosphate in comparison with those that did not contain additives. These results suggest that some phosphate additive containing plant-based milks may contribute similar phosphate load to cow's milk and have a less favourable PPR profile due to their reduced protein content however there is variability between brands. Plant-based milks which do not contain phosphate additives appear to have a more favourable profile in terms of phosphate load as well as PPR; however it should be noted that many of these do not contain calcium fortification. Results associated with this study is obviously limited to the types and brands of milks sampled however it would be of benefit to a wider range of products to gain a better overview of the phosphate content of plant-based milk products on the market in the UK.

Conclusion: Phosphate analysis of the samples plant-based milks has shown significant higher phosphate concentrations in those which contain phosphate additives versus those phosphate additives. Phosphate content and PPR was variable between milk type and brand. Plant-based milks without added phosphate may be a suitable alternative to cows' milk for individuals with renal disease following a low phosphate diet.

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How accurately completed is nutritional screening on a renal ward?

Ms Deepa Kariyawasam, Ms Anastasia Gkegka, Ms Rochelle Blacklock

Department of Dietetics, King's College Hospital, London

Ms Deepa Kariyawasam

Biography
Deepa Kariyawasam is a senior renal dietitian at King's College Hospital and multi-professional clinical lead for the London Kidney Network (LKN). Deepa is also currently on the executive board committee of EDTNA/ERCA and the editorial board of the Journal of Renal Care. Deepa has been involved in the chronic kidney disease guideline for the National Committee of Clinical Excellence (NICE) in the UK and has also led on the development of the multi-award winning British Dietetic Association Renal Nutrition Group patient resources for lowering potassium incorporating multicultural foods which won a Kidney X Patient Innovation Award as well as an NHS Parliamentary Award for Health Equity for the London region. Deepa also co-chairs the health equity group of the LKN.

Abstract

Introduction:

NICE guidelines suggest that all hospital inpatients should be nutritionally screened using a validated screening tool on admission and weekly (NICE 2012). It is a commissioner requirement that the hospital achieves a compliance rate of 95% for screening, though our Trust sets its target as 100%. The Renal Inpatient Nutrition Screening Tool (iNUT) has been shown to be a validated screening tool in the renal setting (Jackson et al 2019) and is used on our renal wards.

An audit conducted in another UK renal unit (James and Jackson 2018) found poor completion rates of 0% using a paper-based iNUT screening tool. Previous audits in our own centre have shown completion rates between 18-70%. Accuracy of the completed iNUT were not established.

An audit was undertaken to explore the percentage of iNUT completed and the accuracy of the data collected.

Methods:

A cross-sectional audit was conducted over 3 days in a 28 bedded adult renal ward between Aug 2023 and Sept 2023. The iNUT was completed independently by both the nursing staff, as part of routine nursing care integrated into electronic patient record, and by the Renal Dietitian, for comparison. To determine the accuracy of the data, the iNUT completed by nurses was compared with the iNUT completed by a renal dietitian within 7 days (mean=2.9 days, median=2 days).

Results: Out of 88 patients, 78% (n=69) of patients had an iNUT completed by the nursing team within the last 7 days. For those assessed on the new/initial screening form, 61% of the results matched between the dietitian and nurse for all of the questions in the tool. When looking at each individual question, 83-93% of the answers for each question matched between the nurse and the dietitian.

Discussion: The majority of patients on our ward were appropriately screened with iNUT but there is room for improvement to achieve Trust targets. Of those screened, not all were accurate when comparing the dietitians and nurses screen. This shows that the iNUT tool is being attempted but training may be needed to improve accuracy. Training had previously improved completion, therefore it needs to be seen if training taking into account the themes of the discrepancies can further improve the completion rates as well as accuracy.

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Poster number: 264

Submission number: 474

Does dietitian prescribing practice in chronic kidney disease align with person-centred care? The patient perspective.

Mrs Nicki Ruddock[1,2], Professor Nicola Thomas[1], Dr Sharon Rees[1]

[1]London South Bank University, London. [2]University Hospitals of Leicester NHS Trust, Leicester

Mrs Nicki Ruddock

Biography
I am a Dietetic Advanced Clinical Practitioner at University Hospitals of Leicester NHS Trust and a part time Professional Doctorate student at London South Bank University. I qualified as a dietitian in 1993 and have spent most of my career working with people with kidney disease, with a special interest in the management of CKD-MBD and dialysis. In 2018, I qualified as a non-medical prescriber and this has been the focus of my research.

Abstract

Introduction

Dietitian prescribing, still in its infancy, is starting to be evaluated. Two themes have been used as the basis for this: the clinical area, namely CKD, as a key field for dietitian prescribing, and person-centred care (PCC) care. In UK prescribing practice and CKD care, PCC is a key priority for both care providers and patients (NHS England, 2021; UK Kidney Care and UK Kidney Association, 2022; Royal Pharmaceutical Society, 2021).

However, PCC is challenging to define as it can be conceptualised differently, according to individual's perspectives and context (Nolte et al., 2020; Gachoud et al., 2012). Helpfully, The Health Foundation (2016) presents four principles which are integral to PCC, regardless of context: care that is personalised, enabling and coordinated, whilst treating people with dignity, compassion and respect. Therefore, to establish if care is person-centred, it is necessary to explore patients' views. In the context of dietitian prescribing, patient perspectives on the person-centredness of their experiences are unknown. This is the focus of this study.

Method

Semi-structured interviews were used to explore patient experiences of dietitian prescribing. Following ethical approval, patients were recruited from three sites where kidney dietitians prescribed. Interviews were conducted by telephone using an interview guide which was developed from research literature. Interviews were recorded, transcribed and thematic analysis is underway (Braun and Clarke, 2006).

Results

15 interviews were undertaken, five from each of three sites. Age of participants ranged from 35 to 88 years with both men and women represented. Ethnicity was mostly White British. All participants were having dialysis treatment and prescribing was undertaken on dialysis units. Medicines used in the management of chronic kidney disease – mineral bone disorder (CKD-MBD) were the items most prescribed. On completion of analysis of the interview transcripts, themes will be developed, but initial codes have identified many features of interest.

Patient knowledge was improved, and they felt well supported by the dietitian prescribers following development of strong relationships. Dietitian prescribers were described as professional, friendly, and personable and they were good at listening and communicating well. Patients were confident in dietitian prescribers, with one participant indicating that they were the 'best person, in the best position, to do that', echoed by many of the other participants. A few participants felt that dietitian prescribing worked well as part of a team approach and others were reassured that Consultants supported the role. In comparison with other prescribers, dietitian prescribers were described as thorough, spending more time explaining treatments, and were more accessible and approachable. Patients felt involved in treatment decisions and found the process more efficient, creating trust. Negative perspectives of experiences with dietitian prescribers were not indicated.

Conclusions

Dietitian prescribing for those with CKD is well evaluated by patients. Initial coding highlighted many PCC concepts, and these will be progressed into themes. The majority of participants expressed some advantages such as efficiency and feeling more supported.

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Poster number: 265

Submission number: 575

The nutritional implications of very low-calorie diets in advanced chronic kidney disease and obesity.

Ms Alison Lyles[1], Miss Laura Griffin[2]

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Ms Alison Lyles

Biography
After graduating with a BSc (hons) in Pharmacology from Edinburgh University, I continued my training, obtaining MSc in Dietetics from Queen Margaret University in 2007. Since then, I have worked in acute adult dietetics within NHS Tayside and NHS Lothian in a variety of clinical specialty areas including: care of the elderly, general surgery, gastroenterology and oncology. Latterly, this has focused on dietetics within the area of Renal Medicine. This is a complex area of dietetic practice which incorporates chronic disease management alongside behavioural change skills to educate and empower patients and their carers to make appropriate dietary modifications whilst ensuring nutritional adequacy. I currently work as a lecturer in Dietetics and Nutrition at Queen Margaret University. My research interests include weight management strategies in renal disease and nutritional composition of phosphates within processed foods,

Abstract

Introduction The use of very low-calorie diets (VLCDs) is gaining interest as a weight management strategy for obese individuals with chronic kidney disease (CKD) due to their efficacy in other patient groups[1]. It is well known that weight loss in overweight and obese individuals can be an effective strategy in preventing and managing kidney disease progression and ensuring eligibility for transplantation, which remains the best treatment option for end-stage renal failure (ESRF) in terms of both survival and cost. Whilst VLCDs have been shown to be effective in inducing rapid weight loss, their use in adults with CKD is more complicated than for the general population due to dietary and fluid restrictions. This study aimed at quantifying the nutrient composition of commercially available VLCD products alongside oral nutritional support (ONS) products (approved by the Advisory Committee of Borderline Substances (ACBS)) in order to assess their suitability as VLCDs in relation to renal specific nutrient recommendations for patients with advanced CKD or on maintenance haemodialysis (MHD). **Methods**: Meal plans were created (~600 kcal/d) from 6 distinct commercial VLCD companies in the United Kingdom (UK) in the form of 1) a shake based meal plan & 2) a food-based meal plan based on manufacturer guidance/ 3-4 products per day. Additionally, similar meal plans (~600 kcal/d) were created using 10 distinct ACBS approved ONS products using half and/or fully bottles only. The nutritional composition of each meal plan was compared to the renal specific nutritional recommendations[2] for patients with advanced CKD and MHD.

Results

		Protein (g)	Sugar (g)	Fibre (g)	Salt (g)	Potassium (mg)	Phosphorus (mg)	Fluid (ml)
Nutritional recommendation	MHD	87	<30	>25	5	1950–2730	800-1000	500-1000
	Pre-HD	63	<30	>25	5	As per biochem	As per biochem	Unrestricted
VLCD (shake based)	Optifast	60	30	11	2	2838	1065	600
	Exante	63	5	16	1	2862	1218	600
	1:1 diet	60	60	9	3	2345	1491	681
	Lighter Life	52	22	30	3	2016	756	800
	Shake that Weight (made with water)	63	51	13	3	2660	895	1250
	Shake that Weight (made with milk)	64	66	8	3	2700	1257	750
	Keediet (made with water)	59	51	12	3	2600	975	1000-1250
	Keediet (made with milk)	59	66	7	3	2820	1368	750
VLCD (meal based)	Optifast	59	24	14	4	2750	1230	400
	Exante	51	27	12	4	2636	1324	260
	1:1 diet	44	28	12	4	2704	1185	427
	Lighter Life	53	21	13	4	2412	844	600
	Shake that Weight	51	26	12	4	2277	1057	460
	Keediet	49	16	9	2	1997	791	280
ONS	Fortisip	24	27	0	1	636	312	400
	Fortisip compact protein	37	34	0	0	244	706	250
	Fortisip Extra	39	36	0	1	880	788	400
	Nepro	27	11	4	1	350	237	330
	Ensure Plus Milkshake	25	26	0	1	640	400	400
	Ensure Plus Juice	21	41	0	0	84	44	440
	Ensure Shakes	25	48	0	1	941	613	250
	Fresubin Renal	9	25	4	1	300	165	300
	Renilon 4.0	13	16	0	0	87	19	313
	Renilon 7.5	24	15	0	1	103	28	313

Table: VLCD meal plan in relation to renal nutritional recommendations (note protein recommendations have been calculated based on a 79kg patient who would have a BMI of 25kg/m2 at average male height 1.78m). Red = high in comparison with recommendation. Blue – low in comparison with recommendation

Discussion: Variation exists between types of VLCD meal plan and VLCD product. All meal plans were insufficient for fibre in relation to nutritional recommendations. Shake based and ONS-based VLCDs tend to be higher in free sugars, often exceeding recommendaitons. Meal plans may be insufficient in protein to meet protein requirements for an individual of average height on MHD. ONS-based meal plans may be more suited to individuals who are required to follow potassium, phosphorus and fluid restrictions on MHD however these maybe insufficient in protein for long-term use.

Recommendations: VLCD meal plans may be safe and suitable as a weight management strategy for individuals with advanced renal disease however a patient-specific approach should be undertaken to ensure that specific meal plans and/or products are suitable for their individual needs. Special consideration should be given to potassium, phosphorus and fluid restrictions alongside other associated nutrients (fibre and sugar) relevant to associated conditions such as diabetes mellitis. Further research is required to explore patient outcomes alongside the use of VLCDs in renal disease.

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Vascular access & HD service delivery

Poster number: 266

Submission number: 434

A Hybrid approach to salvage a Clotted Arterio-venous graft.

Leah-Kate Butler[1], Mr Amro Elboushi[1], Heidi Jimenez[1], Tamasin Stevenson[2], Dr Stephen John[2]

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Leah-Kate Butler

Biography
I qualified from Coventry University in 2017, post-graduation I spent a short time as a nurse on the trauma and orthopaedics ward at Heartlands hospital. I then Joined the Renal team as a haemodialysis nurse in 2018 where I found my passion in renal and later gained an interest in vascular access, shared care and education. In 2022 I was fortunate enough be appointed a job within the Renal vascular access team at heartlands hospital, continuing my passion caring for renal patients. Throughout my nursing journey I have worked closely with the MDT gaining experience and knowledge in vascular access, educating staff and patients in order to provide the best possible care for dialysis patients throughout their journey.

Abstract

Introduction:

An arteriovenous fistula (AVF) is considered the goldstandard for primary vascular access Argual et al (2021).Arteriovenous fistula (AVF) are considered superior to Grafts(AVG) because of the longer secondary patency after successful cannulation for dialysis James C.Harms et al(2016). Blood is more likely to clot in grafts because they are made of a prosthetic (foreign) material (Beth Israel Deaconess Medical Center (2022). When a AVG clots or begins to fail there are several interventions that can be done either in interventional radiology or surgically. Increasing number of publications are demonstrating the importance of considering a hybrid approach in selected cases such as revision of aneurysmal AVF Kostiuk et al (2023), reduction of venous aneurysm causing steal syndrome Yonkus et al (2023), managing degenerative AVF's Al-Musawi et al (2020),treatment of venous anastomotic lesions in AVG Go et al(2020) and many more.

Caste Study:

A 54-year-old Male with a Left forearm loop graft, presented to haemodialysis with nil thrill present. USS showed ClottedAVG, around 4 weeks post creation. The patient was booked for open thrombectomy and on table fistulogram and fistulaplasty. The angiogram showed a large volume of clot was present along with a tight stenosis at the venous anastomosis. The Stenosis was treated initially with standard angioplasty balloon followed by a high-pressure balloon. Final angiogram

showed residual stenosis at anastomosis withreasonable flow and a palpable thrill restored at end of procedure. Patient was planned to undergo surgical fistuloplasty next available theatre list.

Unfortunately, the graft re-thrombosed 48 hours later and further hybrid revision was required. The procedure started with surgical Graft thrombectomy followed by exposing the venous anastomosis the vein was very friable with multiple tears. Initially a patch was considered feasible but because the vein was too friable, a jump graft (10 mm Dacron) was anastomosed to the brachial vein just above the elbow.

Angiography showed the vein distal to the anastomosis is still diseased, with a small calibre. A cover stent (VIABAHN®) was used to extend into the brachial vein in the proximal aspect of the arm. Final angiogram showed excellent flow. The patient was successfully needled 1 day post procedure. USS was used to identify needling areas due to multiple incision sites. Patient has been using the AVG with no further problems and is being monitored regularly in the surveillance program.

Discussion:

Patients with AVGs have a limited number of options forvascular access. All approaches should be considered to maintain a graft running including open, endovascular and hybrid approaches. The graft venous anastomosis is notorious for developing intimal hyperplasia. In this case, the stenosis developed in a relatively short period of time. Patch plasty is a known approach to widen the anastomosis. Retrospectively,using this approach with a high-pressure balloon might have not been the right approach. Despite the need of two procedures to salvage the AVG, this case has shown that using a hybrid approach should be considered in selected cases

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Poster number: 267

Submission number: 134

The association between nurse led fluid assessment and bioimpedance analysis for target weight adjustments in haemodialysis patients.

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Peter Jurczak

Biography
Apprentice Dietitian at University Hospitals Derby and Burton, studying at Coventry University. This abstract was developed as part of a master's dissertation project.

Abstract

Introduction

Target weight (TW) assessment using bioimpedance in haemodialysis patients is becoming increasingly common and is recommended by the UKKA (1). The current practice in our unit is based on a clinical Nurse Led Fluid Assessment (NLFA) tool. This project aims to explore the association between the two tools.

Methods
We retrospectively analysed data derived from standard clinical practice in a sample of 15 in-centre maintenance haemodialysis patients for whom the NLFA and bioimpedance tests were completed on the same dialysis session. Bioimpedance analysis was performed using InBody 770 after dialysis, NLFA was completed during dialysis. The NLFA tool uses a clinical scoring system where recent intradialytic hypotension, cramps on dialysis and improving appetite score towards an increase in TW. On the other hand, high post dialysis blood pressure, ankle oedema, recent hospital admission and worsening appetite score towards a decrease in TW. A normal range of extracellular water to total body water ratio (ECW: TBW) indicating normal hydration was set between 0.36-0.39 as determined by the manufacturer. Baseline demographics, clinical and laboratory parameters and medications were retrieved via local electronic renal database (VitalData). Data were analysed using IBM SPSS Statistics Version 28. The Fisher's exact test was used to compare the result of the bioimpedance analysis and individual elements of NLFA.

Results

This study included 10 (67%) males, and 5 (33%) females. Their mean age was 63 (SD 17) years with mean dialysis vintage of 28 (SD 20) months. 60% (n=9) had diabetes and 67% (n=10) were on regular antihypertensive medications. The majority (87%, n=13) had a serum albumin <35g/L. Their mean post

dialysis systolic blood pressure was 134 (SD 29) mmHg with mean ultrafiltration volume of 1.6 (SD 0.8) L. Post dialysis, their mean ECW: TBW was 0.392 (SD 0.013):47% (n=7) >0.39, 53% (n=8) between 0.36 and 0.39 and none < 0.36.

All patients with ankle oedema (n=2), recent inpatient stay (n=1) or worsening appetite (n=1) all had ECW: TBW (>0.390) suggesting fluid overload. Of the 4 patients with cramps on dialysis, 75% (n=3) had ECW: TBW (>0.390). Mean ultrafiltration volume appeared greater in patients with cramps 1.7 (SD 0.8) litres than those who did not experience cramps 1.6 (SD 0.9). None of the 5 patients with recent intradialytic hypotension (n=5) or improving appetite (n = 7) had ECW: TBW ratio (<0.360). Overall, there was no statistically significant association between ECW: TBW and individual elements of NLFA (Table 1).

Table 1
Association between ECW: TBW using bioimpedance and individual elements of the NLFA tool.

			ECW: TBW Ratio		
		N	< 0.36	0.36-0.39	> 0.39	Fisher's Exact test P Value (2-sided)
Intradialytic Hypotension in the last 30 days	Yes	5	0%	80%	20%	0.282
	No	10	0%	40%	60%	
Post Dialysis Systolic Blood Pressure >130	Yes	9	0%	44%	56%	0.608
	No	6	0%	67%	33%	
Ankle Oedema	Yes	2	0%	0%	100%	0.200
	No	13	0%	62%	38%	
Cramps on Dialysis	Yes	4	0%	25%	75%	0.282
	No	11	0%	64%	36%	
3 or more Inpatient Days in the last 30 Days	Yes	1	0%	0%	100%	0.467
	No	14	0%	57%	43%	
Worsening Appetite	Yes	1	0%	0%	100%	0.467
	No	14	0%	57%	43%	
Improving Appetite	Yes	7	0%	71%	29%	0.315
	No	8	0%	38%	62%	
Total		15	0%	53%	47%	

Discussion

This retrospective analysis showed that for patients with signs and symptoms of overhydration including recent admission, worsening appetite and ankle oedema, there was 100% agreement with bioimpedance ECW: TBW ratio > 0.390. However, sample size was too small for statistically significant results. The exception to this is cramps, this may be due to the higher ultrafiltration volume for patients with cramps, or because cramps are multifactorial.

No patients with signs and symptoms of underhydration were shown to be underhydrated with bioimpedance ECW: TBW ratio <0.360. This may indicate the need for a specific ECW: TBW range when using bioimpedance in a haemodialysis population, possibly due to the older age and low albumin in this population.

In conclusion, bioimpedance may have greater potential to recognise signs and symptoms of overhydration than underhydration in a haemodialysis population when using the manufacturer suggested ECW: TBW ratio.

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Maintaining high arteriovenous fistula prevalence rate; a single haemodialysis unit experience

Mr Bernard Barrios

University Hospitals Birmingham NHS Trust,, Birmingham

Mr Bernard Barrios

Biography
Senior Charge Nurse, Runcorn Road Dialysis Unit, University Hospitals Birmingham NHS Trust

Abstract

Introduction

Arteriovenous Fistula (AVF), the standard for haemodialysis vascular access, minimizes infections risk. Inadequate AVF function is the leading cause of renal patient hospitalization, resulting to high-cost hospital admissions and severe morbidity and mortality consequences.

Methods

The comprehensive approach includes education, training, and workshops for nurses. Since 2019, we've utilized the BRS Pre-Cannulation Assessment Tool for AVF monitoring. The New AVF Assessment and Cannulation Tool ensures meticulous observation of newly created AVFs. Surveillance is enhanced through access flow (Qa) measurements and a referral algorithm. Local ultrasound scanning of AVFs by nurses facilitated by the availability of an ultrasound machine in the haemodialysis unit. The active engagement of Nurse Link Roles, representing 16.8% (4/24) of nurses, further strengths the collaborative framework, ensuring effective communication.

Results

Education- 16.8% (4/24) attended formal ultrasound workshops, 41.7% (10/24) engaged in scanning training by shadowing the Vascular Access Nurse Specialist (VANS) during clinic sessions, and 37.5% (9/24) participated in the Vascular Access Study Day. Qa measurement training has been extended to all staff as part of their competency. These statistics underscore nurses' dedication to continuous learning, contributing to enhanced patient care and proficiency in renal vascular access management.

Monitoring- a systematic approach has been adopted since early 2019 with the implementation of the BRS Pre-Cannulation Assessment Tool for all AVF patients. This tool is valuable in evaluating the AVF before cannulation. The New AVF Assessment and Cannulation Tool has been introduced for timely cannulation of new AVFs, aiming to monitor maturation and facilitate the timely removal of Tunneled Dialysis Catheters (TDC), enhancing patient outcomes.

Surveillance- from 2016 to 2018, the Transonic Machine was used for Qa measurement. From March 2018, the twister method for Qa measurement, along with the Qa Measurement and Referral Algorithm, has enabled systematic, effective referrals and follow-ups, contributing to early detection of vascular access dysfunction, paving the way to timely surgical and radiological interventions.

Nurse Link Role- the active link role responsibilities involve ensuring timely Qa measurements, monthly audit reports, organizing vascular access referrals and appointments, coordinating pre-op blood tests, and arranging patient transport. Regular coordination with the VASN is maintained to update patients' access plans for the dialysis unit, ensuring a comprehensive and coordinated approach to renal vascular access management. Administrative time is allocated to link nurses for fulfilling these responsibilities.

The nurse link role involves education initiatives aimed at patients and colleagues, emphasizing effective referral systems, a rapid and timely escalation process, communication, staff awareness, and peer-to-peer ultrasound training. The implementation of ultrasound-guided cannulation for challenging fistulas further showcases a commitment to enhancing patient experience and safety.

Runcorn Road Dialysis Unit
AVF Prevalence Rate per Year
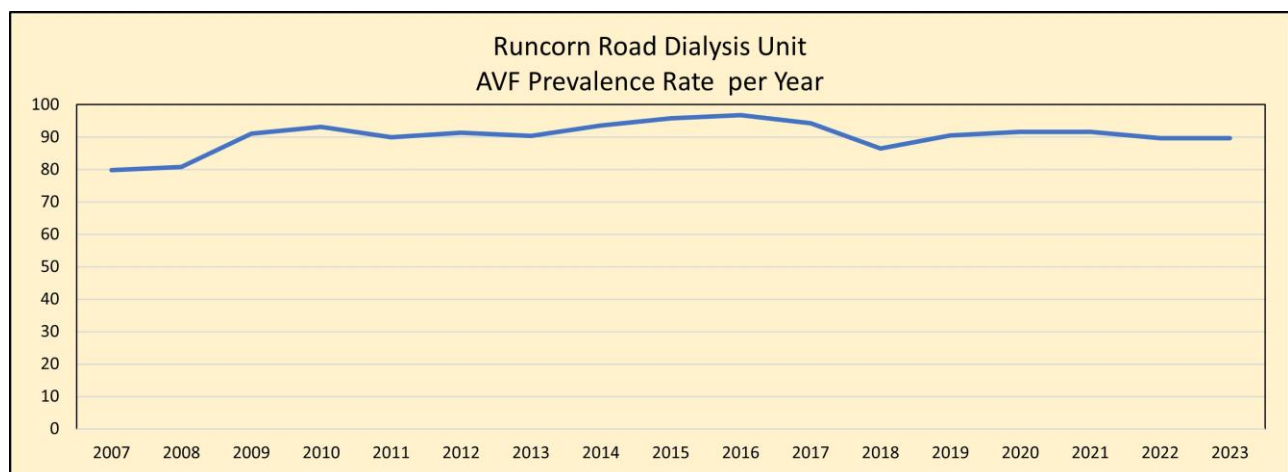
Discussion

Achieving optimal AVF prevalence rates requires both systematic monitoring and surveillance, along with nurses' education. However, challenges like low staffing levels and maintaining continuity hinder sustained momentum in this critical process. Overcoming these challenges is essential for ensuring a consistent and effective approach, ultimately enhancing AVF outcomes and patient care in renal settings.

Poster number: 269

Submission number: 315

Exploring the impact of a supplementary nurse prescriber on the multidisciplinary team of a satellite haemodialysis unit

Anna Tonolete, Dr Bamidele Ajayi, Dr Jyoti Baharani

Heartlands Hospital, Birmingham

Anna Tonolete

Biography
Works as a Haemodialysis Nurse for over 20 years. Non Medical Prescriber

Abstract

INTRODUCTION

Since the introduction of Non-Medical Prescribing in the UK in 1999, the scope of healthcare professionals, including Registered Nurses, has expanded. In June 2021, a supplementary nurse prescriber, trained and overseen by a Renal Consultant, was introduced to our satellite unit. This study aims to assess the impact of this role on service delivery and identify areas for improvement.

METHODS

A questionnaire was developed to gather feedback from various health care professionals within the unit and the department's multidisciplinary team. The survey focused on evaluating the supplementary prescriber's impact on Haemodialysis prescriptions, Hepatitis B vaccination, support in Anaemia management, Nutritional and metabolic balance support, and management of dysfunctional lines and antibiotic therapy. The questionnaire also included open-ended questions for detailed feedback on the benefits and potential improvements.

RESULTS

Out of 29 responses received, the majority indicated a positive impact of the supplementary nurse prescriber on service delivery. Respondents included 19 Haemodialysis Nurses, 2 Access Specialist Nurses, a Renal Research Nurse, 4 Health Care Assistants, 2 Renal Dietitians, and 2 Renal Consultants. Feedback varied, with some reservations about altering antihypertensive medication and providing nutritional advice. Nonetheless, the role was largely viewed as beneficial in enhancing team efficiency and patient care.

Survey Outcome

Bar chart titled "Survey Outcome" with y-axis "No. of Responses" (0 to 30) and x-axis "Question". Categories: HD Prescription updated, ESA/IVFe Management, Hypertension Management, Support Dietitian in management of Ca/Po4/PTH levels, Support Dietitian in providing nutritional advise, Hepatitis B Vaccination, Evidence of support in management of dysfunctional lines/antibiotic therapy, Gives clear advise on patients' renal concerns. Legend: Yes, No, Unable to Comment.

DISCUSSION

The addition of a supplementary nurse prescriber in the satellite haemodialysis unit has mitigated service delays traditionally caused by limited access to doctors for prescriptions. This role has significantly improved the management of Anaemia, Hypertension, Dialysis Access, Vaccination, and Haemodialysis prescriptions, reducing the workload and time demands on Renal Consultants. This change allows doctors to focus more on complex issues within the department. As the number of dialysis patients increases, the introduction of additional nurse prescribers could further enhance service delivery. Integrating this role into senior nursing positions could promote equality of opportunity and empower nurses to utilize their skills more effectively. While not replacing doctors, supplementary nurse prescribers are crucial in nurse-led units, offering strategic, innovative solutions to improve service quality, efficiency, and patient satisfaction.

Allergic contact dermatitis and AV fistulae: more potential allergens than you may have imagined

Dr Daryl Teo[1], Prof James Burton[2,3], Dr Graham Johnston[1]

[1]Department of Dermatology, University Hospitals of Leicester NHS Trust. [2]Department of Cardiovascular Sciences, University of Leicester. [3]John Walls Renal Unit, University Hospitals of Leicester NHS Trust

Dr Daryl Teo

Biography
Dr Daryl Teo is a Dermatology ST6 Trainee in the East Midlands South Deanery. He has a subspecialty clinical interest in cutaneous allergy.

Abstract

Introduction

Haemodialysis is the most prevalent dialysis modality with over 25,500 people on this treatment in the UK. The preferred vascular access is via an arteriovenous (AV) fistula or graft. Best practice needling involves good infection control practices, such as the use of skin sterilisation products during needle insertion. Adhesive tape is used to secure the needle and prevent dislodgement. Additional interventions to reduce patient anxiety includes use of topical local anesthetic preparations. This exposes the patient to many potentially sensitising allergens which can lead to contact dermatitis.

Contact dermatitis is inflammation of the skin caused by direct or indirect skin contact. Irritant contact dermatitis develops after regular, repeated, and prolonged exposure to irritating substances. Allergic contact dermatitis (ACD) is a type IV hypersensitivity reaction to a specific hapten. The consequences of this include pruritis, an increased risk of infection and the potential need for alternative vascular access to rest the affected area.

We present a case of ACD in a haemodialysis patient and outline a strategy for the identification of the culprit hapten.

Methods

We describe a 25-year-old gentleman of South Asian origin with a history of end-stage renal failure secondary to granulomatous polyangiitis. His current treatment is Prednisolone 5mg daily, and hemodialysis through a left radiocephalic arteriovenous fistula having started with a tunneled hemodialysis catheter. Six months into dialysis, he developed an itchy, bullous and papular dermatitic rash over the fistula in the days after dialysis. This rash was responsive to topical corticosteroids. The rash did not occur when the catheter was used for hemodialysis instead. He was referred to the Dermatology department for further evaluation.

The localised nature of the rash raised the possibility of ACD. He underwent patch testing to the British Baseline Series, a series of 50 haptens compromising a wide variety of classes and uses, including metals, fragrances and preservatives, and the extended Medicament series, which additionally includes topical antibiotics, antifungals. In addition, we performed Repeat Open Application Tests (ROAT) to antiseptic wipes used by the dialysis unit (chlorhexidine 2% and isopropyl alcohol 70% versus isopropyl alcohol 70% only) on the volar aspect of both forearms.

Results

The ROAT to topical antiseptics were negative. However, he tested positive to Caine Mix IV, a mixture of topical local anesthetics containing lidocaine 5.0% pet., and prilocaine 2.5% pet.

He was advised to avoid these topical anesthetics and to use a moderate potency topical corticosteroid as required.

Discussion

Patients on hemodialysis are exposed to multiple irritants and haptens including topical medications, dialysis catheters, topical antiseptics, and adhesive dressings. We have shown a case where a patient is found with ACD to topical local anaesthetics. The two commonly used topical anaesthetics are EMLA cream® (lidocaine-prilocaine) and Ametop Gel® (tetracaine).

If ACD is suspected, referrers should provide a list of materials used in the dialysis unit, or patients should be encouraged to take photographs of these materials. Taking a detailed history of possible contact exposures during hemodialysis will help guide a specific test battery to diagnose potential allergens.

Poster number: 271

Submission number: 383

Diabetes in-reach service for people with diabetes on haemodialysis improves knowledge of diabetes and glycaemia– the Education 2 Protect Tomorrow (E2PT) Quality Improvement Project.

Dr. Gabrielle Goldet[1], Ms. Keziah Joseph[2], Dr. Parizad Avari[3], Ms. Sharon McCarthy[4], Ms. Claire Edwards[4], Ms. Jo Reed[3], Dr. Elaine Hui[2], Dr. Neill Duncan[3]

[1]Hammersmith Hospital, London. [2]London North West University Healthcare NHS Trust, London. [3]Imperial College Healthcare NHS Trust, London. [4]London North West University Hospital NHS Trust, London

Dr. Gabrielle Goldet

Biography
Gabrielle Goldet is a renal registrar in North London with an interest in Diabetic Kidney Disease.

Abstract

Introduction: Diabetes is the most common cause of Chronic Kidney Disease CKD in the UK and accounts for 30% of End-Stage Kidney Disease. Despite this, it can be difficult for people on long-term haemodialysis to access diabetes care on account of fatigue, the frequency of dialysis treatments and transport issues. In Northwest London, only 35% of people with diabetes on haemodialysis are seen by specialist diabetes services.

Traditional methods of measuring glycaemia, such as HbA1C, are not sufficiently accurate in people on haemodialysis. Continuous glucose Monitoring (CGM) has recently been validated in this population.

We thus aimed to evaluate how a diabetes in-reach service in a haemodialysis unit could improve diabetes knowledge and glycaemia in this difficult-to-reach population by undertaking a quality improvement project in which a Diabetes Specialist Nurse (DSN) provided structured education, dietetic advice, monitoring through CGM and effected management changes in consultation with a diabetes consultant.

Methods: To identify people likely to engage with the E2PT project, and specifically with CGM, we searched our list of transplant-waitlisted patients in a community dialysis unit and identified 11 people with diabetes not under specialist diabetes care. All were invited to take part in this project and all but one accepted. During their regular haemodialysis sessions, a DSN came to undertake the E2PT program with these patients. Firstly, their knowledge of diabetes was assessed using the validated Diabetic Knowledge Questionnaire (DKQ) (1). People were initiated on intermittently scanned CGM (isCGM) using Freestyle Libre 2 during their dialysis sessions by the DSN and continued for the duration of E2PT. Education on self-management of diabetes, diet and lifestyle were provided during

weekly reviews by the DSN, who also reviewed the CGM data. Based on this data appropriate changes to their diabetes management were made in conjunction with a diabetologist. The DKQ was then repeated at the end of the 16 weeks.

Results: The percentage of correct answers on the DKQ at baseline ranged from 26% to 85%. At endpoint, all 10 patients achieved scores of correct answers > 90%, with two patients scoring 100%. Percentage time in range (TIR: 3.9 – 10.0 mmol/L) significantly improved from baseline (46.1 [30.5 – 91.3]%) to endpoint (63.3 [60.6 – 95.3]%; p=0.013) with no significant differences in hypoglycaemia defined as a blood sugar less than 3.9mmol/L (p=0.919).

After the project, a Patient and Public Involvement Exercise was undertaken in which the above results were fed back to a group of 14 individuals living with diabetes on dialysis. Education was provided about self-management and CGM. Members of the group were given the opportunity to communicate with each other and the clinical team on points of diabetes management particularly important to them. The session received very positive feedback. A plan to create a "Sweet Corner" visual display in the patient waiting room to include simple learning points and useful contacts was formed during this session.

Conclusions: The E2PT improved patient's knowledge of diabetes and overall glycaemia (2). This quality improvement project demonstrates the value of a patient-orientated in-reach service to support self-management in individuals with diabetes on dialysis and has led to further practical changes in our service.

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Poster number: 272

Submission number: 412

Optimising the management and clinical outcomes of patients with tunnelled dialysis catheters and related bloodstream infections

Dr Tianna Salmeron, Dr Emma Vaux, Alison Swain

Royal Berkshire Hospital & Berkshire Kidney Unit, Berkshire

Dr Tianna Salmeron

Biography

Tianna O.M. Salmeron is an Internal Medicine Trainee (IMT2 Doctor) currently working at the Royal Berkshire NHS Foundation Trust. She completed her medical education at the University of Aberdeen and later earned an MSc with Distinction in the Control of Infectious Diseases from the London School of Hygiene & Tropical Medicine (LSHTM). She has always been deeply interested in antimicrobial resistance (AMR) and antimicrobial stewardship. This interest was further nurtured during her tenure at LSHTM, where she served as an AMR Centre Student Liaison Officer. In this role, she was responsible for increasing awareness among MSc students about AMR issues and ongoing research, promoting events organized by the AMR Centre, contributing to the monthly newsletter, and engaging in outreach activities, such as presenting papers at journal clubs in NHS hospitals. In her ongoing efforts to advance this interest and increase understanding among medical professionals and the public of the role they can play in combating AMR, she continuously seeks quality improvement opportunities related to infection prevention and the optimized management of patients with infections.

Abstract

Infection rates among haemodialysis patients can be up to 26 times higher than in the general population, partly due to the increased use of tunnelled dialysis catheters (TDCs) for haemodialysis. This leads to high morbidity and mortality among this cohort and increased healthcare costs. In August 2022, a notable increase in TDC-associated bloodstream infections (BSIs) was observed in our inpatient unit. This quality improvement project aimed to evaluate the management of these patients according to trust guidelines and to identify any patient education factors contributing to the development of BSIs, with the overall goal of reducing morbidity and mortality from TDC-associated BSIs.

Data from patients admitted with TDC-associated BSIs (January 2022 – January 2023) were collected using an electronic case report form. This included demographic and clinical data as well as data relating to guideline adherence. Additionally, a mixed-methods, paper-based patient survey was conducted by unit staff with patients at one of their regular haemodialysis sessions across the five regional dialysis units.

In 2022, there were 13 admissions for TDC-associated BSIs from five dialysis units. The mean patient age was 58 years (IQR=44-72), and 77% (10/13) were male. Among these, 46% were infected with *Staphylococcus aureus* (6/13), including one methicillin-resistant strain. The mortality rate was 23% (3/13). Blood cultures were taken for all patients, but only 38% (5/13) were paired blood cultures. A consultation with a microbiologist occurred for 85% (11/13), with 77% (10/13) having subsequent follow ups. Follow-up was conducted with 70% (7/10) of those who survived to discharge, averaging 22 days post-discharge (IQR=11.5-25). However, data on pre/post-BSI patient information provision and re-education post-BSI remains unclear.

A survey of 76 patients in routine dialysis sessions revealed that 75% (57/76) either did not recall receiving or did not receive TDC care information. Of those who did, 84% (16/19) read it. While 83% (49/59) were aware of the need to keep their TDC clean and dry, 54% (41/76) showered with it, and 59% (24/41) of those used pouches. Additionally, 53% (40/76) could not recall any infection symptoms, but 78% (59/76) knew how to respond to an infection. Preferences for receiving patient information varied.

Compliance with trust guidelines was inconsistent. Improvements are needed in ensuring paired blood cultures, prompt follow-up, re-education after discharge, and effective patient information dissemination. Few patients receive information, yet most are willing to engage with it. Potential improvements include re-educating staff during doctor changeover periods and providing GPs with information about not providing shower pouches to TDC patients. We plan to revise patient information materials, offering them in several languages and formats. A re-audit of guideline compliance and a repeat patient survey will be conducted post-implementation to assess the impact of these interventions

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Rags to riches; introduction of a RAG rating system improves timely access to fistula formation

Mrs Heidi Mills, Mrs Jennifer McDermott, Mrs Karen Huxtable

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Mrs Heidi Mills

Biography
Heidi Mills Lead Nurse for Vascular Access. Worked in renal for past 15 years.

Abstract

Introduction

Vascular access pre-assessment and formation process has been identified as a key area of concern by the national Renal Getting it Right First Time report. Permanent vascular access (AV fistula/graft) is associated with better patient outcomes and experience, as well as reduced healthcare costs, compared to central venous catheters(CVC's). The UK Kidney Association guidelines recommend at least 80% of prevalent dialysis patients having permanent vascular access.

In our renal unit, patients were often not having their vascular access formed at the correct time as the clinical urgency was not always communicated to the surgical team. As part of the Kidney Quality Improvement Programme (KQIP) we highlighted this as a key area of improvement for our service.

Methods:

Baseline data from the previous 12 months was analysed and showed high variability in patient waiting times and eGFR at fistula formation. We reviewed our current referral pathway using a process map and used a driver diagram to highlight barriers to improvement. We developed a SMART aim to achieve 80% of suitable prevalent and incident patients with permanent access by April 2024.

Our proposed change idea was to develop a traffic light (RAG) system to help prioritise patients and communicate with the vascular surgery team. This was implemented as part of a PDSA cycle. All patients were assigned a red, amber, or green rating according to dialysis status and eGFR. This spreadsheet was reviewed monthly in MDT meetings between the nephrology and surgical teams.

Our key project measurements include percentage of incident and prevalent patients with permanent vascular access, as well as average time from referral to fistula formation.

Results:

As of October 2023, 147/162 (91%) of prevalent haemodialysis patients in our unit had permanent vascular access. Waiting times from referral to access formation have been collected and are presented within the charts below.

We have found using the RAG rating system has significantly improved communication within the renal team and when referring for access formation. The introduction of monthly MDT meetings has enabled better teamworking and provided opportunities to discuss difficult cases and plan optimal timing of access formation.

Discussion:

The introduction of a traffic light system has streamlined our vascular access referral process and helped to ensure that patients are prioritised at referral for fistula formation at the right time. Staff feedback has been positive as it has led to improved multi-professional communication. This has also led to the creation of a new vascular access nurse specialist role in our unit to improve patient care before and after fistula formation.

Through KQIP we have attended quality improvement workshops and shared our RAG rating process across the region and other renal units have already chosen to adopt a similar system. We hope that other units around the UK may benefit from using a traffic light system to improve timely access formation. We look forward to sharing the full results of our project at UK Kidney Week.

Mean Average wait (in days) for AVF formation by RAG rating

Category	Value
Previous Average (2021-22)	69
Red patients	47
Amber Patients	58
Green Patients	81

New RAG System with Mean Averages in days
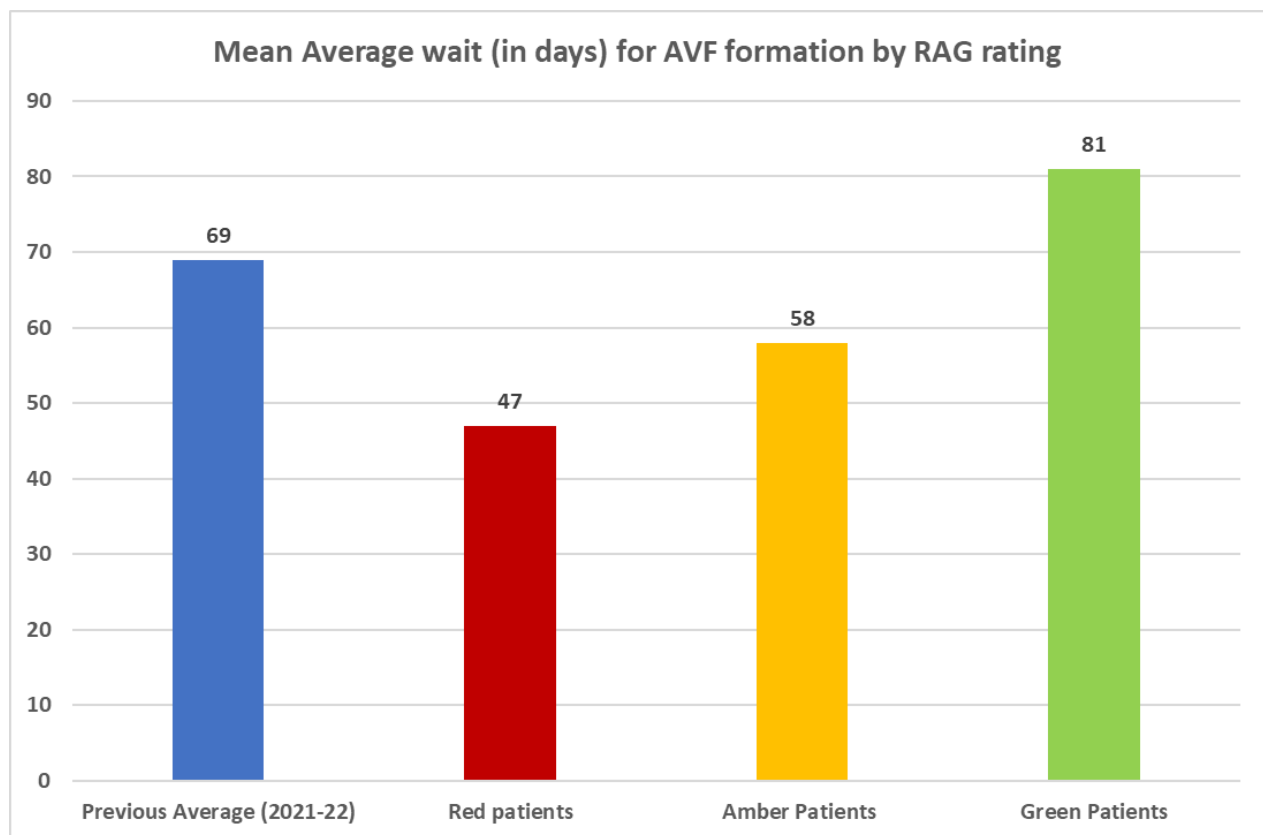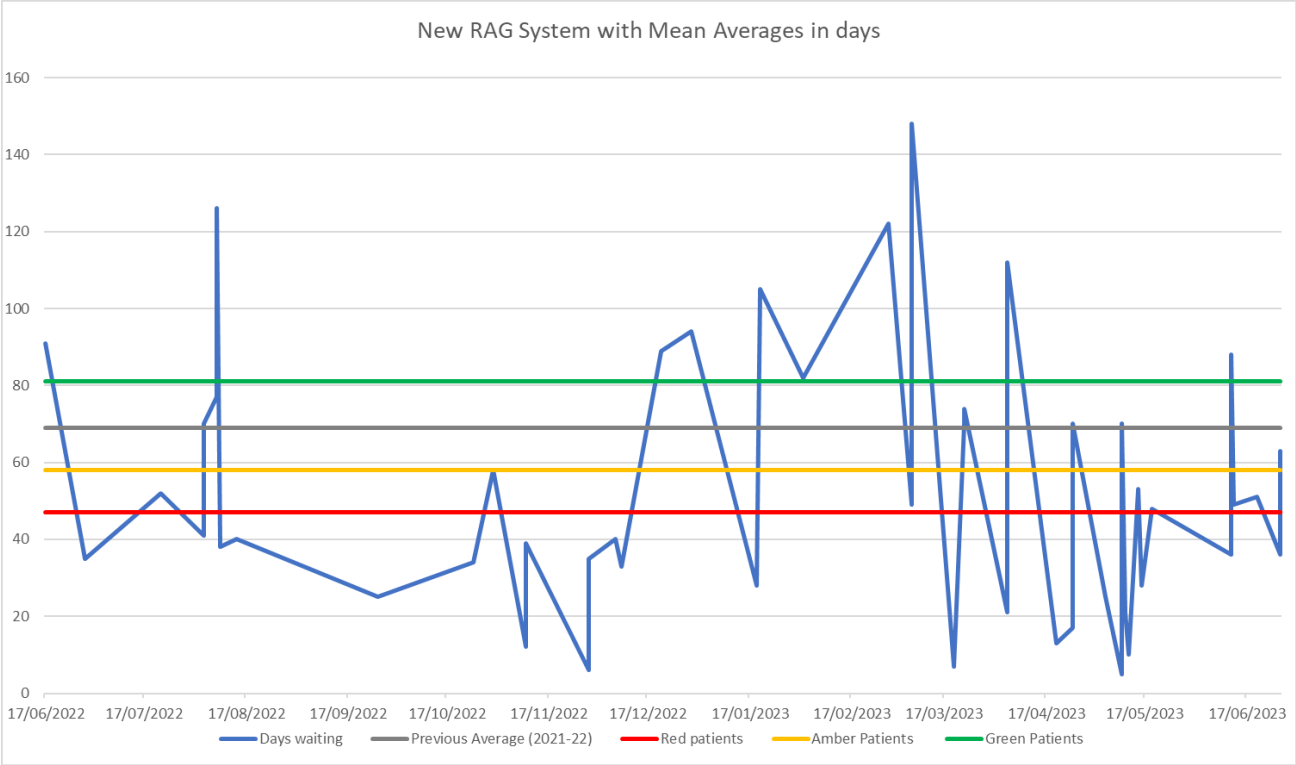
Poster number: 274

Submission number: 083

The experience of shared decision making for people with end stage kidney disease undergoing haemodiaylsis and their families - a scoping review

Mrs Mari Mc Peake[1], Dr Felcitiy Hasson[2], Proffessor Sonja Mc Ilfatrick[2], Professor Neal Cook[1]

[1]Ulster University, Magee Campus. [2]Ulster University, Belfast Campus

Mrs Mari Mc Peake

Biography
Mari is a Lecturer of Nursing within Ulster University with over 16 years clinical experience working with people with end stage kidney failure. Specially as both the ward manager of a haemodiaylsis unit and later of a general nephrology inpatient ward she has been involved and helped shape the lives of many kidney patients. Her Phd is considering decision making for people undergoing HD and this will benefit everyone involved in kidney care.

Abstract

Background

People with end stage kidney disease, face complex decisions often in time limited situations, including the need to start renal replacement therapy. Shared decision making has been shown to be effective in facilitating decision making, improving experience, and outcomes in palliative care and other chronic illnesses. There is no agreed definition of shared decision making, within renal medicine and most research to date has focused on treatment options rather than the process of shared decision making.

Methods

 A scoping literature review, using Joanna Briggs Institute guidelines.

Data sources: Medline (OVID), EMBASE, CINAHL, Psych Info, ProQuest, Web of Science, Open grey, and grey literature were searched covering years January 2015- July 2022. Empirical studies, unpublished thesis, and studies in English were included. The scoping review was conducted using the Preferred Reporting Items for Systematic Meta analysis – scoping review extension (PRISMA-Scr).

Results

Thirteen studies were included in the final review. Whilst shared decision making is welcomed by people undergoing haemodialysis , their experience is often limited to treatment decisions, with little opportunity to revisit decisions previously made. The role of the family/caregivers as active participants in shared decision making requires recognition.

Discussion

This review highlights the process and experiences of people undergoing haemodialysis, including the type of decisions being made, the timing and who should be involved in the decision-making process. An acknowledgement of the active role family members play, in influencing both shared decision-making processes and outcomes is needed. People undergoing haemodialysis advocate that changing circumstances, necessitate that the process and outcomes of decisions are revisited, yet this is not reflected in clinical practice and treatment decisions to date. This study highlights the need for further high quality and diverse studies, which explore the experiences and expectations of all ages of people undergoing haemodialysis. This should include involving family/caregivers, as part of the shared decision making process.

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Poster number: 275

Submission number: 491

Dialysis access formation in the Octogenarian – experience from one UK centre

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University Hospitals Birmingham, Birmingham

Heidi Jimenez

Biography
I am currently working at University Hospitals Birmingham NHS Foundation Trust for 7 years. Prior to becoming an Access Clinical Nurse Specialist, I was a dialysis nurse for 20 years. Vascular access has always been my passion and I love working with multi-disciplinary team and work with them collaboratively with regards to planning, monitoring, and maintaining my patient's lifeline.

Abstract

Introduction

Vascular access (VA) used in haemodialysis (HD) patients with chronic renal disease includes the arteriovenous fistulae (AVF) (proximal and distal), arteriovenous grafts (AVG) and central venous catheters (CVC). It is a question of debate if there is an advantage or indication to obtain definitive vascular access in patients with advanced age, especially over 80 years. Our aim was to look at the feasibility of VA success in octogenarian patients.

Methods

Retrospective analysis was undertaken of electronic records of all patients undergoing vascular access (AVF proximal, distal and AVG), aged >79 years from 01/01/2019 to 30/04/2023. The analysis looked at patients from one of the main hospital sites and 3 satellite units in the West Midlands with approximately 450 HD patients.

Results

The sample included 39 patients. Of the sample, 66% were male and 34% female. 95% of the patients had started dialysis aged between 80 and 89 years, with the remainder being over the age of 90 years at the first dialysis session. 65% of the patients were Caucasian and 40% of the population was diabetic.

>90% of our octogenarian HD population started in a planned fashion via the Advanced Kidney Care Clinic.

Evaluation of functional status at the start of dialysis showed a Karnofsky index of between 50 and 70 for 80% of the patients and 20% were below an index of 40.

60% of the population started dialysis with an AVF, 10% with a CVC and 30% needed a temporary line because of sudden progression of kidney failure and hospital admission. 2 patients converted to peritoneal dialysis over the period studied. 90% of those that started with a CVC had a successful AVF formed and used for HD in the next 12 months.

All patients starting dialysis with permanent access had a Karnofsky score of 60 or over.

Discussion

It is possible to achieve permanent vascular access (AVF or AVG) in octogenarian patients starting dialysis.

Functional status is a more important determinant than the chronological age when it comes to permanent access. Age alone should not be a barrier to create permanent dialysis access.

Poster number: 276

Submission number: 625

Kidney DOM – developing a standardised reporting tool for In-centre Haemodialysis (ICHD) capacity to manage rising demand and avoid patient harm due to insufficient dialysis capacity

Stephen Cass, Peter Wilson, Dr Robert Elias, Dr Ravi Rajakariar, Dr Andrew Frankel, Nicola Cunningham, Katie Durman, Wendy Brown, Sarah-Louise Harwood

London Kidney Network, London

Stephen Cass

Biography
London Kidney Network Director / member of the LKN management team

Abstract

INTRODUCTION

Renal units, London ICBs and NHSE have not had a systematic and unified way of ensuring clear visibility of ICHD capacity pressure or the risks associated with running ICHD services close to operational safe capacity. This work introduces, and evaluates, a standard dialysis occupancy measure as a reporting tool and an effective proxy for clinical safety, patient experience and service resilience.

METHODS

The definition of the agreed metric and reporting tool required an iterative process with wide stakeholder discussion and significant piloting to establish a meaningful and reliable measure. It was agreed to utilise a metric measuring Estates Capacity, the maximum possible dialysis sessions/slots related to the number of physically available dialysis machines with plumbed water and power. In conjunction with the data on physically available dialysis slots the reporting tool also includes a measure of the available Staffed Capacity which is a metric measuring the number of available dialysis sessions that are appropriately staffed for the acuity of the patient cohort, and ready for immediate use.

It was agreed by consensus that a renal unit working "in balance" will operate with the Dialysis Occupancy Measure related to Estates Capacity at a threshold of 90%.

RESULTS

Following collection of pilot data it has now been possible to present the agreed KDOM for London as of February 2024. This demonstrates that ICHD Estate Capacity currently runs at 86.9% (range 64.6 % - 101.2%) and available Staffed Capacity at 94.8% (range 73.6 % - 104.0%) across the whole of London. However there was significant variation between dialysis centres. (See Fig 1).

Feb-24	Unit1	Unit2	Unit3	Unit4	Unit5	Unit6	Unit7
Patients % Max Estates Capacity	83.6%	64.6%	0.0%	94.4%	98.4%	101.2%	84.6%
Patients % of staffed capacity	94.7%	73.6%	0.0%	92.3%	100.0%	104.0%	102.1%

FIG 1 Dialysis Capacity Outcome Measure across London Renal Dialysis Centres

DISCUSSION

Operating ICHD facilities at higher levels of occupancy (at or above 90% of Estates Capacity) increases the likelihood of risks to delivering a safe and reliable service.

1. Units may not be able to offer patients dialysis close to home resulting in increased travel costs, negative impact on quality of life and sub-optimal dialysis which is likely to have a negative impact on adherence and lifestyle including childcare and employment.
2. Reduced service flexibility impacts on other health appointments, e.g. transplant work up and vascular access clinics, resulting in higher DNAs and less efficient and less cost-effective care.
3. New patients may be dialysed using inpatient dialysis spaces, thereby disrupting inpatient bed usage within the wider acute medicine flow in the hospital, increasing LoS.
4. London units struggle to offer "Dialysis Away From Base" for patients visiting London or on holiday.

The Kidney Dialysis Occupancy Measure represents the first agreed tool to assess dialysis capacity and provide a basis for discussion between commissioners and providers. The tool is now being used, as a pilot, to generate discussion across the system in London, between renal units, NHSE and ICB teams in relation to capacity and both short and longer term planning.

This data is also being linked to other outcome data to identify relationship between capacity and both clinical outcome and patient experience. We find that this tool is useful in describing the capacity pressures across our ICHD units but clear next steps are to ensure that we add quality measures and patient experience indicators alongside this metric. We also wish to build upon this work alongside a wider suite of demand and capacity reporting tools such as future growth trajectory and a comprehensive kidney patient flow model.

Poster number: 277

Submission number:97

A novel role for extracellular matrix dysregulation in the development of sarcopenia in individuals with chronic kidney disease

Dr Emma Watson[1], Dr Luke Baker[2], Dr Thomas Wilkinson[3], Dr Matthew Graham-Brown[1], Mr Robert Ashford[4], Professor Alice Smith[3]

[1]Department of Cardiovascular Sciences, University of Leicester. [2]Department of Respiratory Sciences, University of Leicester. [3]Department of Health Sciences, University of Leicester. [4]Department of Orthopaedics, UHL

Dr Emma Watson

Biography
Dr Emma Watson is an internationally renowned muscle biologist with a focus on mechanisms of muscle wasting in people with kidney disease and has developed cutting edge techniques to test the impact of the uraemic state on muscle in vitro. She has worked on both clinical exercise studies in those with chronic kidney disease studying the impact of different interventions on muscle mass, and at the cellular level for the past 16 years.

Abstract

Introduction: Reduced physical function and strength and loss of muscle mass (termed sarcopenia), is a frequent complication of chronic kidney disease (CKD). Sarcopenia starts early in the disease process and leads to a downward spiral of muscle wasting, disuse, reduced quality of life and poor outcomes. However, as skeletal muscle is highly adaptive and easily remodelled through interventions such as exercise and nutrition, sarcopenia is likely to be reversible or preventable. Strategies with the potential to improve muscle mass and function are an attractive means to improve quality of life, clinical outcomes and reduce healthcare costs. Unfortunately, the development of interventions for CKD sarcopenia is lacking, primarily hampered by an in-complete understanding of the underlying processes. The aim of this study was to perform untargeted transcriptomics on skeletal muscle from CKD and controls to identify new targets of intervention for CKD sarcopenia.

Methods: Vastus lateralis muscle biopsies were collected from 10 people with CKD stage 3b-4 (mean age 61, range 27-80 years; mean eGFR 24, range 15-31ml/min/1.73m^2) and 10 controls (mean age 62, range 30-76 years; mean eGFR 86, range 62-90ml/min/1.73m^2). All library preparation and untargeted RNA sequencing were performed by Novogene (Beijing, China). Differential gene expression (DEG) analysis was performed using the DESeq2 package in R. Genes with adjusted P value <0.05 and with a |log2(FoldChange)|>=1 were considered differentially expressed. A hierarchical clustering analysis of DEGs was performed. Functional enrichment analyses that included Gene Ontology (GO) and Kyoto

Encylopedia of Genes and Genomes (KEGG) pathway analysis were performed to determine which DEGs were significantly enriched in which GO terms or metabolic pathways.

Results: On average 10,025 genes were found to be expressed in the CKD group and 10,232 genes in the control group. Differential gene expression analysis identified 2263 genes that were differentially expressed in CKD vs. control samples: 981 were upregulated and 1345 were downregulated. Enrichment analysis showed all the traditionally accepted pathways involved in skeletal muscle wasting were upregulated within CKD skeletal muscle (i.e. upregulation of ubiquitin-mediated proteolysis). Interestingly, pathways relating to extracellular matrix composition and regulation and wound healing dominated the downregulated processes. Genes downregulated included Collagens 1, 4, 5, 6, 15 and 16, Matrix Metalloprotease 14, platelet-derived growth factor receptor alpha, and the extracellular matrix protein 'secreted protein acidic and rich in cysteine' (SPARC), all of which are involved in extracellular matrix structure and function and ultimately in muscle repair and regeneration.

Discussion: This transcriptomics analysis of CKD skeletal muscle has identified the presence of dysregulation in extracellular matrix composition and regulation and in the process of wound healing within CKD skeletal muscle. This novel finding has important implications. Extracellular matrix dysregulation may contribute to development of CKD sarcopenia, with potentially profound negative effects on muscle structure, function and performance. Functional wound healing processes are paramount for the maintenance of skeletal muscle health and function. Therefore, our data highlights potential new therapeutic targets and avenues for the prevention and treatment of CKD-related sarcopenia.

Poster number: 278

Submission number: 214

Novel urinary biomarkers of renal epithelial senescence predict outcomes in patients with chronic kidney disease.

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Dr David Baird

Biography
I am a Renal Registrar based at the Royal Infirmary of Edinburgh. I recently completed a PhD at the University of Edinburgh and my research has been focused on finding urinary biomarkers of kidney senescence. These could be used to identify patients that are at higher risk of kidney disease progression and who might benefit from therapies targeting senescent cells.

Abstract

Introduction

Epithelial senescence is proposed as a driver of kidney fibrosis with senescent cell (SC) depletion improving outcomes in murine models. There are currently no non-invasive biomarkers for quantifying renal SCs. This represents a major obstacle for human trials of senolytic therapies. We used biopsy and urine samples from patients with kidney disease to identify urinary biomarkers of renal tubular senescence and then assessed the capacity of the most promising candidates to predict progression in patients with chronic kidney disease (CKD).

Methods

Immunofluorescence staining for cell cycle arrest marker p21CIP1, proliferation marker Ki67 and tubular markers CD10/CKPAN was performed in human kidney tissue from 104 CKD patients that all had matched urine samples available. P21CIP1 (positive) / Ki67 (negative) tubular cells were classified as senescent (expressed as a percentage of all tubular cells). In the discovery cohort (collected in Edinburgh, n=51), LC-MS studies were performed on matched urine samples. Proteins qualified as candidate biomarkers if they predicted the level of histological senescence in multivariate linear regression models alongside baseline eGFR, age and ACR and were upregulated in an *in vitro* renal senescence dataset. Candidate biomarkers were validated in a separate cohort (collected in Glasgow, matching baseline characteristics to subgroup 1, n=53) that had both urine and kidney tissue available. Proteins were corrected for urinary creatinine levels throughout.

The top performing biomarkers where then probed further to determine if they predicted renal progression (defined as reaching end-stage kidney disease or a 40% decline in eGFR from baseline) using urine samples from n=322 participants with kidney disease (eGFR < 60 mls/min and / or ACR > 30mg/mmol) who were followed up for 3 years. Time-to-event analyses (Kaplan-Meier and Cox regression) was used.

Results

331 proteins were detected by LC-MS of urine in the discovery cohort, of which, 143 had a positive correlation with renal tubular senescence (adjusted p<0.05) 5 candidate biomarkers that were upregulated in renal tubular senescence *in vitro* were taken forward for validation. Of these, 2 remained highly correlated with and predictive of histological senescence in the validation cohort (biomarker 1 rho = 0.61, p < 0.001 and biomarker 2 rho = 0.62, p < 0.001, p < 0.05 for both in multivariate linear regression models) [proteins not named pending patent applications but will be named in any presentation].

In the outcome cohort, the CKD progression endpoint occurred in 47 participants. High levels of both top performing urinary senescence biomarkers was associated with an increased rate of CKD progression (see figure).
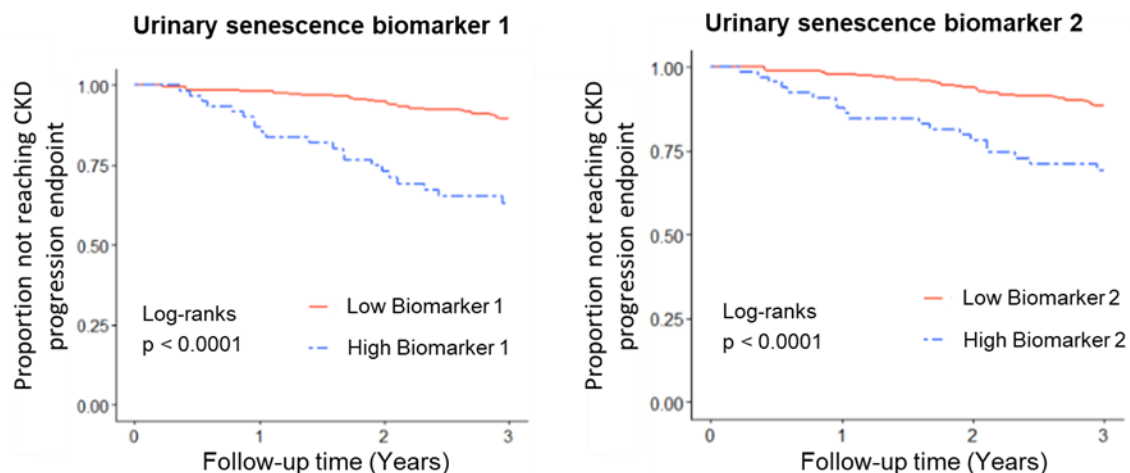
Figure legend: Kaplan-Meier survival curves for progression of kidney disease comparing high versus low levels of 2 urinary senescence biomarkers. Log rank p value shown, n=322.

This remained significant for both biomarkers after adjusting for other risk factors including baseline eGFR, age, ACR, systolic blood pressure and sex (p < 0.05 in multivariate Cox regression analyses).

Discussion:

We have identified and validated 2 urinary biomarkers of senescence. These could aid patient selection for clinical trials of senolytic treatments in kidney disease and act as prognostic biomarkers to identify patients at increased risk of kidney disease progression.

Poster number: 279

Submission number: 236

In silico study of the action of furosemide on human Aquaporin 1

Dr Aled Lloyd, Dr Karl Austin-Muttitt, Dr Jonathan Mullins

Swansea University, Swansea

Dr Aled Lloyd

Biography
Having completed his Master's degree in Chemistry and Drug Discovery at the University of Bath, Aled returned to his hometown to study postgraduate Medicine at Swansea University Medical school. He remained in the city to continue his medical training and since then, has specialised in Nephrology and General Medicine and worked as a registrar in the field throughout South Wales. Aled has since undertaken a sabbatical from his medical training to undertake a PhD at Swansea University. Now in his third year, Aled's work looks at computational chemical modelling of proteins in the kidney and how existing drugs interact with these proteins

Abstract

Introduction

Furosemide inhibits the passage of water through AQP1 by interacting with the cytoplasmic side of the protein. We previously identified a novel putative site for this interaction in molecular docking studies. An initial 20 nanosecond molecular dynamic simulation revealed that furosemide moved from this original docked position but induced a conformational change in a nearby cytoplasmic chain. Multiple 100 nanosecond MD simulations were applied to characterise this protein-drug interaction.

Methods

I-TASSER was used to generate monomeric structural models and Modeller for assembling oligomers. PLANTS was used for docking simulations. CHARM-GUI and bespoke software were used to prepare membrane-bound systems to run in GROMACS using graphic processing units (GPU's) in Google Colab. Three 100 nanosecond simulations were undertaken (300 Kelvin and 1 bar). The results were analysed by visual inspection and root mean square deviation (RMSD).

Results

There was little reproducibility between repeat simulations in this experiment. The furosemide molecule ended up in a different position in each simulation. It remained in the pore opening in one simulation, bound in a position adjacent to the pore opening in another and interacted with the cytoplasmic chain in the third. There are several different positions at the cytoplasmic opening of human AQP1 capable of maintaining a relatively stable interaction with furosemide.

Discussion

No single binding site accounting for the inhibition of water transport through human AQP1 has been identified in this study. Furosemide can form relatively stable interactions at several locations on the cytoplasmic side of AQP1. Studies of furosemide binding at the cGMP binding region of AQP1 are planned.

Poster number: 280

Submission number: 237

In silico drug repurposing screen of Aquaporin 1

Dr Aled Lloyd, Dr Karl Austin-Muttitt, Dr Jonathan Mullins

Swansea University, Swansea

Dr Aled Lloyd

Biography
Having completed his Master's degree in Chemistry and Drug Discovery at the University of Bath, Aled returned to his hometown to study postgraduate Medicine at Swansea University Medical school. He remained in the city to continue his medical training and since then, has specialised in Nephrology and General Medicine and worked as a registrar in the field throughout South Wales. Aled has since undertaken a sabbatical from his medical training to undertake a PhD at Swansea University. Now in his third year, Aled's work looks at computational chemical modelling of proteins in the kidney and how existing drugs interact with these proteins

Abstract

Introduction

Inhibition of water transport through AQP1 could potentially reduce the efficiency of peritoneal dialysis (PD) as AQP1 has been identified as the ultrasmall pre of the 3 pore model. There is evidence from laboratory studies that AQP1 is inhibited by loop diuretics but there is little other evidence of existing licensed compounds acting on this protein. We have developed protocols and programs for an *in silico* high-throughput repurposing screen using structural modelling, docking, and molecular dynamics (MD). Uniquely our approach uses a bespoke interface on Google Colab for graphic processing units (GPU's) to run the MD simulations. We describe its application to the cytoplasmic opening of the human aquaporin 1 (AQP1) water pore aiming to identify potential inhibitors of water transport.

Methods

The library of BNF listed compounds was obtained from NCBI PubChem. I-TASSER was used to generate monomeric structural models and Modeller for assembling oligomers. PLANTS was used for docking simulations. CHARM-GUI and bespoke software were used to prepare membrane-bound systems to run in GROMACS using GPU's in Google Colab. 20 nanosecond simulations were undertaken (300 Kelvin and 1 bar) to discriminate between binding and non-binding events.

Results

Complete monomeric and tetrameric structural models of human AQP1 were obtained incorporating chains of water molecules traversing the pores. Docking studies of 1002 drug compounds at the cytoplasmic opening of AQP1 identified 200 compounds binding in the pore. 45 compounds exhibited a

higher calculated binding energy higher than the known binder furosemide and underwent further testing using MD. The 20 nanosecond MD simulations distinguished the compounds which were not binding and elucidated the dynamics of the binders. Several commonly used medications exhibited stable interactions including gabapentin, pregabalin and pravastatin. A noteworthy finding was that furosemide induced a conformational change in the cytoplasmic chain.

Discussion

Furosemide, gabapentin, pregabalin and pravastatin could inhibit water transport through human AQP1 based on this *in-silico* screen. This is potentially relevant to diuretic therapy and peritoneal dialysis.

Poster number: 281

Submission number: 238

SGLT2 computational structural studies investigating polypharmacy

Dr Aled Lloyd, Dr Karl Austil-Muttitt, Dr Jonathan Mullins

Swansea University, Swansea

Dr Aled Lloyd

Biography
Having completed his Master's degree in Chemistry and Drug Discovery at the University of Bath, Aled returned to his hometown to study postgraduate Medicine at Swansea University Medical school. He remained in the city to continue his medical training and since then, has specialised in Nephrology and General Medicine and worked as a registrar in the field throughout South Wales. Aled has since undertaken a sabbatical from his medical training to undertake a PhD at Swansea University. Now in his third year, Aled's work looks at computational chemical modelling of proteins in the kidney and how existing drugs interact with these proteins

Abstract

Introduction

Sodium Glucose Cotransporter 2 (SGLT2) is the main active transport protein involved in sodium and glucose reabsorption in the kidney. SGLT2 inhibitors (SGLT2i) are widely recommended for patients with diabetes, heart failure and chronic kidney disease (CKD). Many multimorbid patients will be prescribed these compounds resulting in polypharmacy. We have performed a computational drug repurposing screen to identify other licensed drugs capable of binding at or near the SGLT2i active site aiming to identify compounds that could either compete with SGLT2i or inhibit sodium and glucose transport.

Methods

The library of BNF listed compounds was obtained from NCBI PubChem. D-I-TASSER was used to generate monomeric structural models and MODELLER was used to incorporate MAP-17 and empaglifozin from a reference structure (PDB 7VSI). CHARM-GUI was used to insert the protein into a membrane. The centroid of a 5 nanosecond GROMACS molecular dynamics (MD) equilibration was used for docking studies using PLANTS. A bespoke tool was used to identify compounds interacting with key protein residues. CHARM-GUI and bespoke software were used to prepare membrane-bound systems to run in GROMACS using GPU's in Google Colab. 10 nanosecond simulations were undertaken (300 Kelvin and 1 bar) to discriminate between binding and non-binding events.

Results

The SGLT2-MAP17 structure in the inward-open conformation obtained showed good agreement with published structures. Existing SGLT2i (empaglifozin, dapaglifozin, canaglifozin, ertuglifozin) all feature in the top 1% of docked compounds in the repurposing screen. 17 compounds were investigated by MD, with all remaining bound to the protein in simulation. Ceftriaxone, tobramycin, clindamycin, fluvastatin, atorvastatin and ticagrelor were among the compounds with potentially significant interactions.

Discussion

It is not clear whether the stable ligand interactions identified here would result in inhibition of sodium and glucose transport, or if the interactions might provide competitive inhibition for SGLT2i compounds currently used. The compounds identified have no hitherto recognised interactions with SGLT2i; nor do they result in adverse effects suggesting inhibition of the protein. This study is limited by considering only the protein-ligand interaction and not wider pharmacokinetic or pharmacodynamic factors.

Conclusion

The indication of interactions with several compounds likely to be prescribed alongside SGLT2 inhibitors, such as antibiotics, statins and antiplatelet agents, warrants further investigation of the potential for polypharmacological complications.

Computational drug repurposing screen targeting PLA2R antibody binding.

Dr Aled Lloyd, Dr Karl Austin-Muttitt, Dr Jonathan Mullins

Swansea University, Swansea

Dr Aled Lloyd

Biography
Having completed his Master's degree in Chemistry and Drug Discovery at the University of Bath, Aled returned to his hometown to study postgraduate Medicine at Swansea University Medical school. He remained in the city to continue his medical training and since then, has specialised in Nephrology and General Medicine and worked as a registrar in the field throughout South Wales. Aled has since undertaken a sabbatical from his medical training to undertake a PhD at Swansea University. Now in his third year, Aled's work looks at computational chemical modelling of proteins in the kidney and how existing drugs interact with these proteins

Abstract

Introduction

Approximately 60% of patients with membranous nephropathy have antibodies against the phospholipase A2 receptor (PLA2R). The cysteine rich (CysR) epitope of PLA2R is a likely site of protein-antibody interaction. Current treatment regimens for membranous nephropathy involve maximal conservative management or systemic immunosuppression in severe cases. We have developed protocols and programs for an in silico high-throughput repurposing screen using structural modelling, docking, and molecular dynamics (MD). Uniquely, our approach uses a bespoke interface on Google Colab for graphic processing units to run the MD simulations. We describe their application to a repurposing screen aiming to identify larger licensed drug molecules capable of impeding antibody-protein interactions at the site of the CysR epitope.

Methods

A complete model of PLA2R was obtained from I-TASSER using the canonical sequence on the UNIPROT database. This structure was equilibrated using a five nanosecond molecular dynamics (MD) simulation. The simulation was prepared using CHARMM-GUI and run on the GROMACS-ON-COLAB platform. The centroid of the MD system between three and five nanoseconds was used for docking experiments using PLANTS PLP with a study area that included the CysR epitope. A library of compounds listed in the British National Formulary was used for the docking studies. The results would be analysed by PLANTS energy and by key residue overlap score.

Results

Viable docking results were obtained for 891 of the 1510 compounds tested. 60 of these compounds were in contact with at least 10% of the residues in the CysR region. By restricting these results to compounds in the lowest 20% of the total sample for calculated binding energy, 22 compounds remained. 16 of these compounds have been assessed for their safety for oral or intravenous use. These sixteen compounds were then identified for further investigation by MD to assess the stability of the identified interactions. The sixteen compounds include Lymecycline, Trazodone, Mirabegron, Sulfasalazine, Methotrexate, Rosuvastatin and Montelukast.

Discussion

Structural bioinformatics methods provide a relatively fast and economical option for identifying protein-drug interactions that could result in new treatment strategies. The compounds identified for investigation are used for an array of different health conditions. However, they all share the chemical properties of large molecular weight and have the potential to form multiple hydrogen bonds. If validated experimentally, these compounds could provide new treatment options for PLA2R antibody positive membranous nephropathy.

Poster number 283: WITHDRAWN

Validation of nanoparticles targeting renal tubular cells as a tool for gene therapy.

<u>Dr Nesreen Hamad</u>[1], Dr Emily Young[2], Ms Ana-Vanina Hangu[3], Ms Gözde Tezcan[3], Professor Gavin Welsh[4], Professor Moin Saleem[1,5], Dr Wen Ding[1,5]

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Dr Nesreen Hamad

Biography

I earned my bachelor's degree in pharmaceutical sciences with an outstanding 'Excellent with Honor' distinction from Suez Canal University, Egypt, in 2005. Subsequently, while working as a pharmacist, I pursued a diploma in industrial pharmacy. In 2008, I traveled to Japan, where I worked as a technician in Tasuku Honjo's Lab at Kyoto University. During my time there, I delved into the study of antibodies diversification through somatic hypermutations. In, 2012 I graduated with a master's degree in Immunology and Genomic Medicine. In 2020 I got PhD in Molecular Biology from Kyoto University, Japan. I worked as a researcher in the institute of advanced energy. My research focused on Protein conformational changes upon binding non-coding nucleic acids. In 2021, I contributed to research at the Drug Research Institute, Assiut University, Egypt, before embarking on a new chapter in the United Kingdom. Joining Bristol Renal at Bristol Medical School in 2022, my current focus revolves around investigating nanoparticles for gene therapy tailored to address inherited kidney diseases.

Abstract

Introduction: Kidney diseases make a substantial contribution to the global disease burden, affecting as much as 15% of the world's population. About 30% of kidney diseases result from monogenic conditions, making them potential targets for gene therapy. However, achieving specific kidney targeting remains a challenge. Nanoparticles are emerging as versatile tools for drug delivery. Our primary objective is to identify nanoparticles capable of delivering therapeutic agents specifically to kidney tubular cells, where several inherited diseases manifest.

Methods: We employed both in vitro and in vivo systems to screen various Hermes™ nanoparticle formulations and validate their ability to target tubular cells. For in vitro screening, mRNA or, 4basebios's proprietary linear hpDNA™ encoding enhanced green fluorescence protein (eGFP) was encapsulated in nanoparticles to evaluate the efficiency of nanoparticle delivery. For in vivo formulations, mRNA encoding firefly luciferase was used as a reporter for gene expression efficiency of the nanoparticles delivered via intravenous injection. Biodistribution was assessed by IVIS (in vivo

imaging system) imaging conducted either by live whole body in vivo imaging or, by ex vivo imaging followed by Immunofluorescence assay using anti luciferase antibody.

Results: Initially, we screened 14 different formulations of nanoparticles using different human renal cell lines. eGFP expression was assessed by fluorescence microscopy, In cell Analyzer and flow cytometry. Formulations that demonstrated high transduction efficiency and minimal cell toxicity were subsequently optimized and the co-encapsulation of three tubular cell targeting ligands into Hermes™ formulations was assessed. Notably, certain nanoparticle formulations demonstrated an impressive in vitro cellular transduction efficiency of up to 95%, all while ensuring around 90% cell viability. Next, we investigated the biodistribution of nanoparticles in mice. While in vivo imaging did not reveal a bioluminescence signal in the kidneys, we observed a distinctive distribution of luciferase in the tubular cells of kidney sections by immunostaining.

Discussion: The fluorescence intensity in the tubular cells varied amongst the different formulations, indicating that certain formulations exhibit higher specificity towards tubular cells. Notably, the formulations with higher tubular specificity, showed lower expression in the liver compared to others.

Our preliminary data suggest that nanoparticles can be a promising gene therapy approach for kidney targeting.

Poster number: 285

Submission number: 274

Identifying the adaptive changes in protein abundance and phosphorylation state in human podocytes subjected to physiological, rhythmic stretch.

Dr Robert Pope, Dr Jenny Hurcombe, Miss Fern Barrington, Professor Gavin Welsh, Professor Richard Coward

University of Bristol, Bristol

Dr Robert Pope

Biography
Robert Pope graduated from the University of West of England before undertaking a part time PhD in neuroscience at the University of Bristol. Robert is currently a Senior Research Associate in the Coward Group in Bristol Renal, where he is investigation mechanosensation in the cells of the glomerulus.

Abstract

Introduction

Although the different cell types that make up the kidney are exposed to mechanical forces such as stretching, there has been little research directed at understanding how these forces are sensed and the downstream consequences. To understand the proteins and phosphorylation events involved in mechano-sensation, we have subjected immortalized human podocytes to a "physiological" rhythmic stretch regimen during culture and subsequently used non-biased Tandem Mass-Tagged (TMT) proteomics and phospho-proteomics to identify the adaptive changes that occur in this setting.

Methods

We developed waveform to match cardiac output, using the Flexcell® FX6000 system. The best available literature suggests the cells of the glomerular filtration barrier are subjected to elongation of approximately 4-10%[1-3], thus our regimen applied an 8% elongation in a P waveform, once a second for 3 days (chronic stretch) or one hour (acute stretch). Standard immortalized podocyte culturing conditions were followed with either acute or chronic stretch being applied whilst cells were in culture at 37°C, immediately prior to lysis and protein extraction. All samples were prepared in triplicate and both quality and quantity controlled.

Results

Proteomic analysis detected more than 13,000 proteins of which approximately 2,000 were significantly differentially expressed in chronic stretch conditions when compared with matched controls, along with a smaller number (>1,100) of significant phosphorylation differences. In contrast to chronic stretch, the acute stretch resulted in fewer than 100 proteins being differentially expressed vs matched controls but, almost 400 proteins showed significant differences in phosphorylation (T Test) (figure 1.). These

observations suggest that whilst chronic stretch mainly results in changes in total protein expression, acute stretch may give rise to phosphorylation changes that bring about earlier signalling effects.

Pathway enrichment analysis using Ingenuity Pathway Analysis (IPA) software identified a plethora of pathways, upstream regulatory molecules, and predicted disease states in both chronic and acute stretch stimulated podocytes. As might be expected these included known mechanosensitive pathways such as *signalling by hippo* and *hippo signalling,* pathways known to be fundamental to podocyte function such as *regulation of Insulin-like Growth Factor (IGF) transport and uptake by IGFBPs (IGF binding proteins)* and also novel associations including *LXR/RXR Activation,* both of which are transcription factors that mediate cholesterol efflux[4].
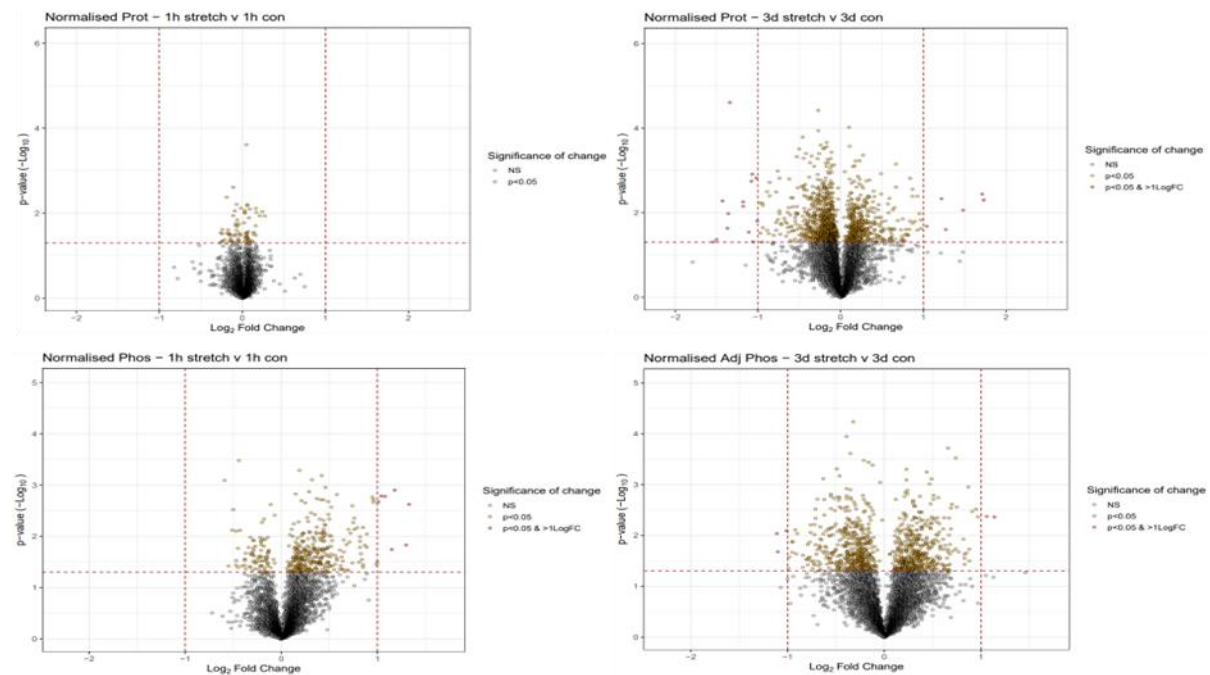
Fig 1. Volcano plots visualizing significant differences in protein abundance (top) and phosphorylation (bottom) in human podocytes that have been subjected to 1 hour (left) or 3 days (right) of rhythmic, physiological stretch when compared to non-stretched control samples.

Discussion

These extensive datasets provide an intriguing insight into the "stretchome" of the human podocyte, revealing a number of novel mechanosensitive proteins and pathways in this cell type.

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Poster number: 286

Submission number: 102

Improving patients' experience with recreational activities on an in-centre haemodialysis unit

Ms Toni Stanley, Ms Sam Inger, Prof Nicholas Selby, Dr Khai Ping Ng

Renal medicine department, University Hospitals of Derby and Burton

Ms Toni Stanley

Biography
Having worked as a haemodialysis technician for 20 years, I recognise how important it is to improve patient experience whilst on haemodialysis. This is often an overlooked area, which could be improved with often already available resources. With strong personal interest in arts and crafts as well as event planning, I realised my skill set could make a difference. Other departments and areas of patient care often have dedicated staff members in charge of patient activities and events, dialysis patients seemed to miss out when it comes to this. In May 2023, I was nominated as the 'Patient Experience Champion' on the in-centre haemodialysis unit at the Royal Derby Hospital, in addition to my role as haemodialysis technician.

Abstract

Introduction

Physical exhaustion, depression or anxiety and general reduced quality of life is prevalent among the in-centre haemodialysis (ICHD) population (1). There is often a sense of loss of autonomy, loss of time and boredom due to treatment and transportation (2). Inspired by the renal art group in Belfast and driven by desire to make the unit feel more like 'home away from home', we aimed to enhance ICHD patients' wellbeing, experience, which might improve treatment adherence and outcome by piloting an array of in-centre recreational activities and surveying patients' experience as well as preferences.

Method

We introduced activities including quizzes, art and craft events as well as themed days with decorations and cakes on the unit. By accessing the hospital's patient experience team, we were able to widen our scope to include mobile museum, mobile library and musicians' performance on the unit and waiting area funded by the Arts Council. We also contacted hospital's volunteers' service, which provided help with some of the events. The activities took place from May to July 2023, following which, we performed a survey examining patients' experience of the activities held and their preferences to guide future work. A five-point Likert scale were used.

Results

Of the 250 ICHD patients, 62 completed the survey. Their mean age was 70 (SD 12) year-old, 58 % were male and dialysis vintage of 4.1 (3.9) years. For quizzes, 24% and 37% stated that they enjoyed or very much enjoyed the activities, whilst 8% not at all and 26% were not involved. For the themed events, the majority either enjoyed (11%) or very much enjoyed (82%) the events with none disliked the events. For the musicians' performances, 10% and 42% enjoyed or very much enjoyed the event, respectively, with only 7% not enjoyed the events. However, 39% did not have the chance to experience the musicians' events. When asked about future painting or drawing events, almost half (45%) where unsure, whilst only 10% and 26% would like to, or would very much like to do so, respectively. Overall, 84% liked or very much liked more of the activities, with 24% preferred themed days, 19% musician events, 8% quizzes and 47% had not preference.

Conclusion

Our initiatives demonstrated feasibility of hosting a variety of recreational activities on an in-centre haemodialysis unit. The survey found that most events are well-received and enjoyed by majority of the patients. A fully decorated, vibrant unit on the themed days or activities which break up the monotony appeared to be a welcomed change. Whilst themed days were popular, many did not have strong preference. However, not all patients were able to access some of the activities, especially those receiving dialysis after 5pm. Staff enthusiasm is vital. Help from volunteers and support from charitable fund are needed to sustain and grow the projects. We aim to provide 'new patients' start pack', ensure activities include evening sessions, hold more themed days, introduce arts events and continue to improve patients' experience during their time on dialysis.

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Poster number: 287

Submission number: 286

What can we learn from patient feedback-exploring the views of patients on haemodialysis and how this could help to shape future renal dietetic service provision

Mrs Gillian Walker, Mrs Susan Reed, Ms Hannah Herron, <u>Ms Hazel Ferenbach</u>

NHS Lothian, Edinburgh

Mrs Gillian Walker

Biography
Team lead for Lothian Renal Dietitians responsible for the operational planning, co-ordination and delivery of the dietetic service to Renal and Transplant Services. 27 years of clinical experience within renal and paediatric specialties. Committed to service improvements which focus on value and person-centred initiatives.

Abstract

Introduction:

Due to increasing demands on the renal dietetic service and recognising the importance of person-centred care, we wanted to obtain feedback from patients about the dietetic care they receive on haemodialysis. We were keen to gather both quantitative and qualitative data which might help to inform and shape future dietetic service delivery. This included asking about frequency of dietetic reviews, what future care might look like to them, the option of patient-initiated reviews (PIR) and their engagement with Renal Patient View (RPV) platform, now Patient Knows Best (PKB).

Methods:

Paper questionnaires were issued to patients on haemodialysis to complete either on the unit or at home. Assistance was provided to complete the questionnaire if required and reassurance given that their responses would remain anonymous. Data was analysed using the JISC online survey platform.   Questions addressed overall satisfaction with the renal dietetic service, how frequently they wished to be seen, their views on PIR, what advice and support they wanted from the dietetic service, how they wanted to receive this support and their experience with the RPV/PKB platforms.

Results:

To date, there have been 114 questionnaires returned. 80% of patients were satisfied or extremely satisfied with the dietetic care. 57% of participants reported that they would like regular feedback from a dietitian (or from a dietetic support worker) and the majority preferred face to face contact on dialysis for these reviews. 32% of patients expressed an interest in the option of PIR rather than regular dietetic input. Less than 25% of patients used RPV/PKB and, of these, 82% used it regularly. Of the 63% of

patients who did not have an RPV/PKB account, 49% were interested in having one. Potassium was the main dietary concern followed by phosphate, fluid and salt. Valuable qualitative feedback was obtained by asking the question - *'Is there anything that the renal dietitians could do better / improve upon'*.

Preferred Frequency of Dietetic Review: *Patients with RPV/PKB Access*

Every 1 month **34** (43%)
Every 3 months **32** (40.5%)
Every 6 months **5** (6.3%)
Every 9 months **1** (1.3%)
Every 12 months **4** (5.1%)
Never **3** (3.8%)

Yes **15** (19%)
No **51** (64.6%)
I don't know **13** (16.5%)
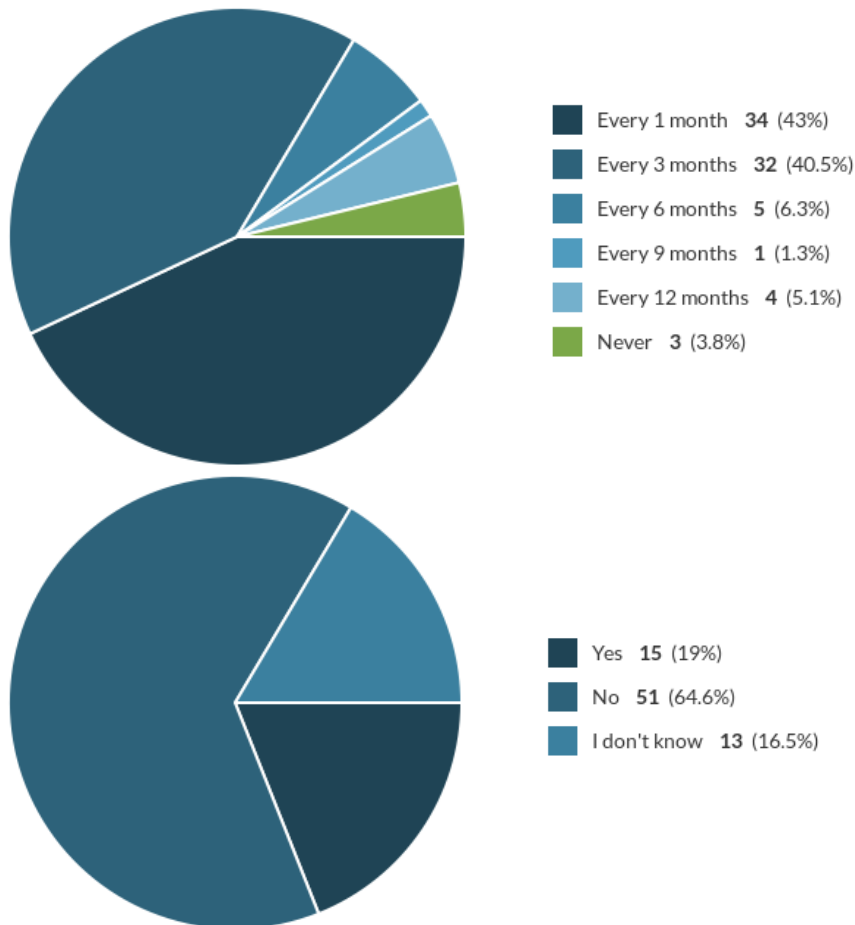
Conclusion:

80% of patients were satisfied or extremely satisfied with their current dietetic care. As many as 38% of patients would like dietetic input once per month and 32% were keen to explore PIR review only. Based on these findings and the qualitative feedback, there is scope to review the dietetic service to the Haemodialysis population and to promote more self-management. This might include encouraging and enabling patients to access PKB and individualising the frequency of review based on what patients want, alongside providing more regular face to face feedback to patients who want this.

Poster number: 288

Submission number: 124

Multiple long-term conditions and sleep quality: the heavy burden of chronic kidney disease.

Miss Roseanne E Billany[1,2], Miss Ella C Ford[3,2], Miss Gurneet K Sohansoha[3,2], Dr Courtney J Lightfoot[3,2], Prof Alice C Smith[3,2]

[1]Department of Cardiovascular Sciences, University of Leicester. [2]Leicester NIHR Biomedical Research Centre, Leicester. [3]Department of Population Health Sciences, University of Leicester

Miss Roseanne E Billany

Biography
A Clinical Trials Facilitator with a background in Exercise Physiology. Interested in exercise and cardiovascular disease in kidney transplant recipients.

Abstract

Introduction

People living with CKD commonly experience co-existing long-term health conditions and the prevalence of poor sleep quality is well-documented across the disease trajectory. Sleep issues not only impact quality of life (QoL) but are also associated with worse health outcomes and mortality, suggesting a bi-directional relationship between sleep and long-term conditions. The aim of this analysis was to explore the relationship between the number of long-term conditions and sleep quality in people living with CKD and their significant others (SOs).

Methods

Between February and October 2023, people living with CKD and their SOs were invited from nine hospital sites in England, to complete an online survey which included the Pittsburgh Sleep Quality Index (PSQI). A PSQI total score of ≤5 is indicative of 'good' sleep. Self-reported data on co-existing conditions (CX) were grouped as follows requiring a yes/no response: kidney, high blood pressure (BP), type I diabetes, type II diabetes, heart-related, stroke, circulatory or blood vessel, lung or breathing, liver-related, cancer, joint/bone/muscle related (MSK), depression/anxiety or other mental health (MH). Between-group differences were analysed using χ^2 or Mann-Whitney U tests. Multiple linear regression, adjusted for age and sex, was used to determine the association between the number of long-term conditions and sleep quality (PSQI total score).

Results

367 participants completed the surveys. 338 had valid PSQI total scores: 291 CKD (age 60 ±14 years; 54% male; 173 (59%) non-dialysis; 66 (23%) kidney transplant; 52 (12%) dialysis [haemo and peritoneal]), and 47 SOs (age 63 ±11 years; 32% male). Median number of CX was significantly higher in CKD (3 [IQR 2,4])

than in SOs (1 [IQR 0,2]), U = 1612, z = -8.555, p <.001. The proportion of participants with poor sleep was greater in CKD than in SOs (60% vs 45%, respectively; p =.046). The top three CX groups in CKD (excluding kidney) were: BP (97%), MSK (35%), and MH (24%). There was a significant association between the number of long-term conditions and sleep quality in patients living with CKD in univariate analysis (F[1, 289] = 21.162, p <.001) and after adjustment for age and sex (R_2 = .112, F[1, 285] = 25.358, p < .001; adjusted R_2 = .103).

Discussion

The results suggest a significant association between the number of CX and poor sleep quality in people living with CKD. Since the relationship between sleep and CX is likely to be bi-directional, the prime management of CKD should take into consideration the number of long-term health conditions, their associated symptom burden, and sleep quality. A multi-disciplinary approach including sleep services and MH support should be sought to encourage increased patient knowledge, self-management, optimal outcomes, and subsequently improved QoL.

Improving the delivery of remote kidney care appointments for underserved groups

Professor Nicola Thomas[1], Fez Awan[2], Dr Jyoti Baharani[3], Dr Emma Coyne[4], Dr Gavin Dreyer[5], Catriona Ewart[1], Dr Chipiliro Kalebe-Nyamongo[6], Udita Mitra[1], Patricia Tum[1], Professor Martin Wilkie[7]

[1]London South Bank University, London. [2]Renal Patient Led Advisory Network (RPLAN), North-West. [3]University Hospitals Birmingham NHS Trust, Birmingham. [4]Nottingham University Hospitals, Nottingham. [5]Barts Health NHS Trust, London. [6]Healthwatch Birmingham, Birmingham. [7]Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield

Professor Nicola Thomas

Biography
Nicola Thomas is a registered nurse and Professor of Kidney Care at London South Bank University. She is also honorary nurse consultant in the renal unit at Barts Health NHS Trust. Nicola has worked within the renal speciality for all her career and has extensive clinical, teaching and research experience. Her clinical and research work has focused on prevention and self-management of kidney disease, with a specific interest in improving patient experience and health inequalities. She is experienced in patient and public involvement/engagement and is a founder member of the Kidney Patient Involvement Network (KPIN). At London South Bank University, she runs four CPD kidney modules. She is the Editor of the 'Renal Nursing' textbook, published by Wiley. She has been President of EDTNA/ERCA, an Executive Board member of the Association of Nephrology Nurses UK and was Programme Co-Chair for UK Kidney Week (2021-2023).

Abstract

Introduction:
Remote kidney appointments (telephone and video calls) are still common post-pandemic and may exacerbate pre-existing inequalities in those from underserved groups (Ewart et al 2022). Those from underserved groups are often not represented in health research and include those with learning disability, mental health needs, hearing/sight problems, young/older people, those from ethnic minority groups. The aim of this project was to improve the quality of remote appointments for these groups.

Methods:
A mixed methods approach with semi structured interviews/focus groups and staff survey was undertaken. Our project team was diverse: one person living with kidney disease, one community leader from Healthwatch, a kidney nurse, three part-time research assistants, three kidney doctors and a kidney psychologist.

Twenty-one patients participated in interviews and focus groups. They described themselves: African heritage (n = 1), Caribbean heritage (n = 4), Asian heritage (n = 6), Indian heritage (n = 1), hearing/sight issues (n =2), mental health needs (n = 5), learning disabilities/differences (n = 1) and young people (under 30 years) (n = 1). All interviews (n = 11) and focus groups (n = 10 people) were conducted online according to participant preference. Seventy-five staff members completed the survey.

Results:
Patient interview/focus group data identified four themes suggesting ways in which remote appointments could be improved. The four themes (with illustrative quotes) were:

The quality of the appointment "*And, even though they say, 'Have you got any questions?' the way they say it is not actually inviting you to say any of them*."

Patient empowerment "*But because I want to have control, I can force it a bit because I think no, you're not doing this to me, we'll discuss it together*."

Patient-practitioner relationship "*I think there is still a need to see somebody (in person), there is always going to be that need because that's how you build the relationship, especially if you are new to kidney failure and you are a new patient.*"

Unique needs for underserved groups "*So, trying to hear and work out the pronunciation at the same time: I was really lost.*"

Almost all staff surveyed have undertaken consultations using telephone or video. Staff reported challenges of remote appointments with specific underserved groups: young people (14.7%), patients struggling with English language (69.3%), cultural or religious issues (17.3%), people with mental health needs (46.7%), people with learning differences/difficulties (62.7%), people with hearing/sight impairment (76%), none (6.7%).

Discussion:
This project is the first to explore experiences of remote appointments among both staff and those from underserved groups living with kidney disease in the UK. This is important as an estimated 25% - 50% of kidney appointments in the UK are still conducted remotely, with wide variation between Trusts and type of clinic. Nephrology or transplant clinics, for example, appear more likely to be remote, and GP appointments are still 32% remote (NHS Digital Nov 2023) .
While remote appointments can be beneficial, our findings indicate that remote consultations need optimisation to meet the needs of patients from different underserved groups. Project findings informed the development of a Toolkit for both patients and staff to support and improve the delivery of remote kidney care. This Toolkit is currently at the last stages of development and will be widely promoted and accessible during 2024.

References

Ewart, C., Baharani, J., Wilkie, M. & Thomas, N. (2022) Patient perspectives and experiences of remote consultations in people receiving kidney care: a scoping review. *Journal of Renal Care*, 48, 143–153. https://doi.org/10.1111/jorc.12419

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Poster number: 290

Submission number: 172

Use of kidney failure risk equation in low clearance clinic

Dr Oonagh McCloskey, Dr Laura Lennox, Dr Rebecca Jones

Altnagelvin Area Hospital, Londonderry

Dr Oonagh McCloskey

Biography
I am a Consultant Nephrologist in Western Health and Social Care Trust, Northern Ireland. I would call myself a 'generalist.' I manage the cohort of low clearance patients in addition to those on home therapies and in centre haemodialysis. I also have an interest in undergraduate medical education. In my 'spare time' I am mammy to 2 small children and try to keep up running and playing netball.

Abstract

Introduction

The kidney failure risk equation (KFRE) uses a combination of gender, age, eGFR and urinary ACR to estimate the projected 2 and 5 year risk of progressing to end stage renal disease (ESRD) in patients with CKD stage 3a-5.

There is abundant evidence that work up for renal replacement therapy (RRT) is most effective within a multidisciplinary low clearance clinic (LCC). Referral to LCC traditionally occurs when eGFR<20ml/min. The KFRE demonstrates good discrimination in predicting ESRD in CKD.

We have used KFRE to identify high risk patients and trigger onward referral to LCC, earlier than would have been the tradition, with the aim of providing timely individualised patient care; particularly increasing rates of pre-emptive renal transplantation and increasing the rates of those commencing haemodialysis on a functioning arteriovenous fistula (AVF).

The aim of this project is to determine whether the use of KFRE over standard eGFR alone allows for a more individualised approach to patient care.

Methods

From Summer 2020, patients who had a 5 year KFRE >50% were referred to LCC in preference to the standard of eGFR <20ml/min.

Quantitative data was collected retrospectively on patients who were newly reviewed in LCC between 1st May 2021 and 28th February 2023. Data collected included gender, age, urinary ACR, RRT modality; starting eGFR and access type and satisfactory outcome for patient. We collected the data from electronic care records.

The data was used to calculate the outcome measures, which included pre-emptive transplant rates, pre-emptive transplant listing, home therapy and access on haemodialysis. These were then compared to data from the UK renal register in 2020.

Results

In total, 54 patients were newly reviewed within the LCC. Range of age 42-96 (average age 71) and slight predominance female (30 female vs 24 males). 22 patients passed away without requiring RRT and 32 patients commenced RRT. We subsequently focussed on the outcomes of patients on RRT.

Figure 1 demonstrates that outcomes in categories improved; pre-emptive transplant rates (63% vs 10%), pre-emptive transplant listing (81% vs 28%) and use of home therapies (15% vs 7%.) There was an associated decline in the use of in centre haemodialysis (47% vs 81%.)

Figure 1
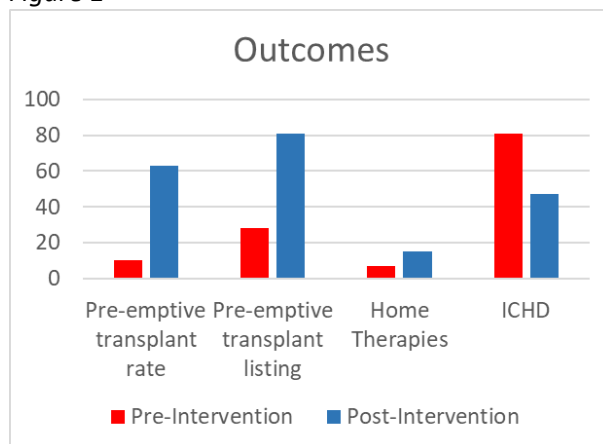
Figure 2 demonstrates the mode of access on commencing HD; 80% started on central venous line (CVL) compared to 70%. 40% were satisfactory starts with CVL and 40% were unsatisfactory.

Figure 2
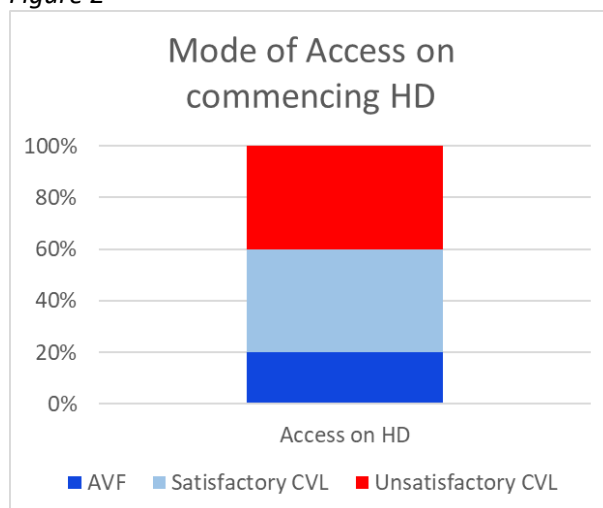
Figure 3 expands on issues surround unsatisfactory haemodialysis starts on CVL. 25% had not been mapped for AVF access, 25% required further intervention prior to AVF usage and 50% had no AVF options/failed formation.

Figure 3
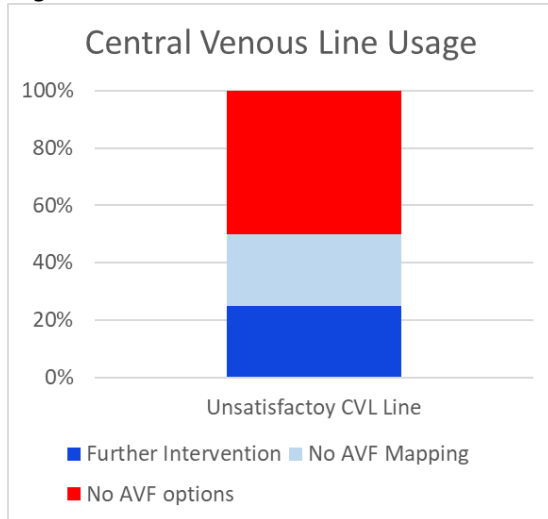
Discussion

Based on our analyses we have proven an associated improvement in patient outcomes in regard to proceeding to pre-emptive transplant by using the KFRE to refer to LCC in preference to the use of eGFR alone.

We hope moving forward, to encourage the widespread use of KFRE to aid identification of high risk individuals who would benefit from pre-emptive transplantation.

Despite improved transplant outcomes, we identified that there was minimal change in regard to AVF rates in appropriate patients. In future, we would like to implement use of KFRE 2 year >40% and referral for HD access, to improve AVF start rates.

Poster number: 291

Submission number: 184

An overview of in-centre dialysis transport in Scotland: issues, concerns and improvements required.

Mrs Judith Connell, Mrs Fiona Loud

Kidney Care UK, Alton, Hampshire, Alton

Mrs Judith Connell

Biography
Judith Connell is Kidney Care UK Policy Officer for Scotland . Her background is in health and social care research. She has worked extensively with a number of universities and charities on health and social care insights.

Abstract

Introduction

Transport is a vital and essential component to attending lifesaving in-centre dialysis treatment, however, people's experience of transport is often less than positive. While a national framework for non-emergency patient transport (NEPTS) exists in England, no such framework currently exists in Scotland to ensure that services are consistently responsive, fair and sustainable and that universal support for people accessing kidney units for dialysis is offered. The PREM tells us that transport is one of the lowest-rated experiences reported by people on dialysis. .

Methodology

In order to ascertain the current state of in-centre dialysis transport in Scotland, we undertook a series of freedom of information requests to each health board alongside contacting key individuals in health board finance and renal departments. The views and experiences of people on in-centre dialysis and those of kidney health care professionals in Scotland were obtained through a transport survey. The survey was advertised and distributed online, via email and social media. Paper copies of the questionnaire were posted to kidney healthcare professionals and individuals attending in-centre dialysis in Scotland who are on our mailing list.

Results

Health boards vary as to the type of transport they use to bring patients to and from their in-centre dialysis and whether this transport is needs assessed or open to all dialysis patients. Variations also exist between health boards in terms of travel reimbursement for those patients who take private and public transport to their in-centre dialysis and whether this is means tested, or available to everyone.

Our survey responses point to the need for more suitable, reliable, flexible, efficient, cost effective and patient-centred transport that is free and open to all regardless of income. It also points to the need for dialysis transport services to be better managed, planned and co-ordinated with improved service provision and communication between transport service providers, kidney healthcare professionals and patients. There is also a need for a better understanding by service providers of the complex needs and health challenges of people on dialysis.

Discussion

Transport is essential so that people can attend life-saving dialysis treatment. A person's experience of that transport can impact on both their physical and emotional wellbeing.

The present state of transport to and from in-centre dialysis in Scotland is an issue and concern to those receiving dialysis and kidney healthcare professionals alike.

In light of our findings, we recommend that the provision of in-centre dialysis transport should be improved with national guidelines.

We call for the universal commitment by all health boards in Scotland to support and implement a fair, efficient, sustainable, reliable and person-centred transport service, where the needs and preferences of people on in-centre dialysis are listened to and considered. We believe that transport provision should be free and open to all people travelling to and from in-centre dialysis regardless of income. No-one should be financially penalised for having to travel to receive life-saving treatment.

References

https://kidneycareuk.org/get-involved/kidney-patient-reported-experience-measure-prem/

https://kidneycareuk.org/get-involved/kidney-patient-reported-experience-measure-prem/2022-kidney-prem-results/

Transport report to be published in February 2024

Converting qualitative data on psychosocial factors influencing access to paediatric kidney transplantation to quantitative output with patient and public Involvement

Dr Ji Soo Kim[1,2,3], Prof Stephen D Marks[1,3], Prof Jo Wray[2]

[1]Paediatric Nephrology, Great Ormond street Hospital for Children NHS Foundation Trust. [2]Centre for Outcomes and Experience Research in Children's Health Illness and Disability (ORCHID), Great Ormond street Hospital for Children NHS Foundation Trust. [3]UCL Great Ormond Street Institute of Child Health, University College London

Dr Ji Soo Kim

Biography
Currently a recipient of an NIHR Doctorate Fellowship grant, is a paediatric nephrology GRID trainee and the national BAPN Trainee representative.

Abstract

Introduction:

Psychosocial factors are known to influence access to kidney transplantation in children with stage 5 Chronic Kidney Disease (CKD) but these factors are poorly understood. An exploratory Mixed Methods (MM) study was designed to prospectively investigate these psychosocial factors by interviewing and distributing questionnaires to participants. Here we describe the process of converting the qualitative interview data for utilisation in the quantitative questionnaire phase of the MM study, with patient and public involvement (PPI).

Methods:

Up to 37 semi-structured interviews took place with children with CKD, their carers and their renal multi-disciplinary team. The interviews were analysed by thematic analysis as per Braun and Clarke to generate preliminary themes. An initial list of existing and validated questionnaires compiled from a systematic literature review and expert recommendations, were mapped against the preliminary themes. The questionnaires were checked for internal consistency and test re-test reliability scores. Over email correspondences and video conference calls, the questionnaires were co-reviewed for their readability, relevance and acceptability with a steering group of patients and families with lived expertise of CKD, dialysis and transplantation.

Results:

An initial list of 18 questionnaires were mapped against them. After steering group reviews, 8 questionnaires were removed due to their unsuitable language, onerous length, limited validated age range and irrelevance to families with CKD. Cronbach's alpha scores of all questionnaires picked for the final distribution list ranged up to or exceeded 0.8. The final list of questionnaires successfully received ethical approval and were distributed in the next phase of the MM study.

Discussion:

Distributing questionnaires that are relevant and acceptable to families with CKD is important. It not only encourages retention but ensures that the research is meaningful to the families. We described the process of engaging the voices of families with lived expertise of CKD to meet this endeavour.

Study Registration Number

IRAS 270493

Poster number: 293

Submission number: 251

The BIRD Study: Improving renal care decision making for people with cognitive impairments

Dr Jordan A. Parsons[1,2], Professor Fergus Caskey[2,3], Amy Verinder[3], Dr Harleen Kaur Johal[3,2]

[1]University of Birmingham, Birmingham. [2]University of Bristol, Bristol. [3]North Bristol NHS Trust, Bristol

Dr Jordan A. Parsons

Biography
Jordan A. Parsons is Assistant Professor in Medical Ethics and Law at the University of Birmingham Medical School and Honorary Senior Research Associate at the University of Bristol Medical School. He has also held visiting positions in Germany, Switzerland, Pakistan, the US, and Australia. Jordan's research spans healthcare ethics, law, and policy, with a particular focus on the use of empirical methods to supplement normative scholarship. His key research areas are kidney care, organ donation and transplantation, sexual and reproductive healthcare, and comparative health policy. Jordan also works on the development of empirical bioethics methodologies, including appropriate use of formal literature reviews and the approach of ethnoimmersion. His research has been funded by the Wellcome Trust, Institute of Medical Ethics, Kidney Research UK, and others.

Abstract

INTRODUCTION:

When a patient in England and Wales lacks decision-making capacity, the Mental Capacity Act 2005 requires care decisions to be made by the treating doctor in the "best interests" of the patient. Determining the patient's "best interests" in discussion with the family can be complex and challenging, particularly when concerning burdensome care (such as dialysis). When disagreement is irreconcilable, cases may progress to the Court of Protection, often representing a breakdown in communication. Despite widespread recognition of the challenges posed by best interests decisions, there is little research examining how they are made and the perspectives of those involved. This is especially true of the particular circumstances surrounding renal care.

METHODS:

The BIRD Study examined how best interests decisions are approached in renal care and the personal perspectives of those involved. Qualitative interviews were conducted with stakeholders (n=27): nephrologists, renal nurses, and "consultees" (family members of patients). Participants were asked to recount their experiences of best interests decision making and explore their views on whether the current system under the Mental Capacity Act 2005 is fit for purpose. Data generated was thematically analysed to construct a robust depiction of participant views and experiences. Initially, data from

healthcare professional participants was analysed separately from that of consultees. The two datasets were then compared to identify areas of convergence and divergence in views and experiences.

RESULTS:

From interviews with healthcare professionals, nine themes were constructed: best interests and quality of life; prioritising patient preferences; family involvement; collaborative decision making; the path of least resistance; dialysis trials as conflict resolution; communication and culture; attachment to patient and clouded judgement; and making the "right" decision. From interviews with consultees, five themes were constructed: respecting the patient's autonomy; ascertaining the patient's preferences; family involvement; rotten (medical) compromise; and second and independent opinions. Participants across groups shared a perspective that the system is limited in allowing for for substantial inconsistencies depending on the individuals involved in any given decision. Communication was highlighted as the primary tool available to prevent and ease disagreements, though was recognised as limited in this ability. Both groups similarly expressed a desire for an improvement in resources available to support best interests decision-making processes.

DISCUSSION:

Participants overwhelmingly considered a lack of open and honest communication to worsen the already complicated and emotional process of best interests decisions. Legal scholarship highlights the importance of centring the patient in decisions, but participants' experiences suggest inconsistency in the extent of this – such that the patient is sometimes instrumentalised in maintaining relationships between the care team and family. For more consistent, collaborative best interests decision making that appropriately focuses on the needs of the patient, a more structured approach to the process is needed. We are now using the findings of this study to develop a suite of resources and training to support best interests decision making in renal care. Using co-production methods, we are designing guidance for professionals, decision aides for patients, and a resources website for patients and their families.

Poster number: 294

Submission number: 278

Does peer support help people with advanced kidney disease cope and adjust better to dialysis and transplantation? A study protocol

Dr Anna Winterbottom[1,2], Ms Eleri Wood[3], Professor Hilary Bekker[2], Mr Keith Bucknall[4], Dr Andrew Mooney[1]

[1]Leeds Teaching Hospitals Trust, Leeds. [2]Leeds Institute of Health Sciences - School of Medicine, Leeds. [3]King's College Hospital, London. [4]patient representative, _

Dr Anna Winterbottom

Biography
Anna is Senior Health Services Researcher (Leeds Teaching Hospitals Trust) and visiting Senior Research Fellow (University of Leeds). She uses her expertise in decision science, psychological theories and health services research methods, to investigate patients and professionals experience of treatment decision making for advanced kidney disease, what factors enable services to support people with kidney disease, and their families, to be involved proactively in their care. Further, her methods draw on shared decision making, health literacy and self-management support frameworks to develop the types of complex interventions needed to innovate practice, evaluating the integration of decision aid interventions on service delivery and patient outcomes, and working in collaboration with health professionals, patient partners, health service methodologists, and decision scientists.

Abstract

Introduction

Dialysis and kidney transplantation are life changing treatments. Some people successfully adjust to treatment; others experience poor psychological outcomes, find treatment burdensome, and experience frustration and disillusionment when treatments do not match expectations and quality of life goals. Health professionals provide information to help people prepare for kidney treatments, but it may be that 'peer supporters' who have lived experience with kidney treatments, could provide more easily understood and relevant information. Many people with kidney disease like to learn from peer supporters and feel more hopeful and confident after doing so. However, peer support provision across the UK is patchy; only 25% of units provide formal support from trained peers and little is known about the mechanisms that make peer support 'good' or successful. Using mixed methods, this research project will explore how different types of peer support can influence people's expectations of treatment and thus affect their lived experience of dialysis and transplantation.

Methods

Two mixed methods studies. Study 1 - Interviews with people with advanced kidney disease to develop an in-depth understanding of pre-treatment expectations and goals of care; lived experience of

treatment after commencing dialysis/post-transplantation; differences between the two; and how standard care and different types of peer support might influence expectations and experience of treatment.

Study 2 – questionnaire to broadly explore the impact of receiving peer support using patient experience, psychological, and decision quality measures.

Recruitment will take place at Leeds Renal Unit and King's College Hospital, London. These large inner-city hospitals include people with kidney disease from diverse social, religious, and cultural backgrounds. King's College Hospital kidney unit has had an active, formal peer support service since 2006; Leeds does not; therefore, we will be recruiting from populations with very different experiences of peer support.

Approximately 25 (study 1) and 160 people with advanced kidney disease (study 2) will be recruited at different points of the patient pathway. Group 1 - pre-treatment, Group 2 - after commencing dialysis/post transplantation, and the same people at both timepoints, pre- and post-treatment (Group 3). Purposive sampling will ensure participants are recruited into two groups of roughly the same size to include those who have and have not received formal peer support. Thematic analysis will analyse interview data (study 1), univariate and multivariate statistics will summarise quantitative data (study 2).

Results

A report will summarise our findings and identify the active ingredients of successful peer support. These findings will be used to improve peer supporter training and other elements of the Peer Support Toolkit.

Discussion

Providing peer support in kidney units is increasingly popular, yet provision is inconsistent and generally low quality. At present, little is known about its utility in making dialysis and transplant easier to live with. Providing an evidence base for using peer support will provide the impetus to move the provision of peer support up the agenda with renal clinicians and commissioners, help enhance pre-advanced kidney disease services to better suit the needs of those approaching that point, improve on the delivery of personalised care, and patient experience of care, and guide the optimal development of peer support programmes and efficient allocation of peer resources as we see the development of regional networks for this popular quality improvement initiative.

Poster number: 295

Submission number: 410

Kidney health inequalities during the COVID-19 pandemic: findings from a scoping review

<u>Dr Emily Beadle</u>[1], Professor Shivani Sharma[2], Professor Fergus Caskey[3,4], Professor Ken Farrington[1,5]

[1]University of Hertfordshire, Hatfield. [2]Aston University, Birmingham. [3]University of Bristol, Bristol. [4]North Bristol NHS Trust, Bristol. [5]Lister Hospital, East and North Hertfordshire NHS Trust, Stevenage

Dr Emily Beadle

Biography
Dr Beadle is a Research Fellow in Health Inequalities in Kidney Disease at the University of Hertfordshire. Her background is in health psychology, having completed her PhD in 2020.

Abstract

<u>Introduction</u>

A report on kidney health inequalities across the UK detailed the stark reality that disparity exists in the development, progress, treatments, and outcomes based on socio-economic status, ethnicity, gender, age, mental illness, geography, and the intersections of such factors[1]. Further, it is recognised that the COVID-19 pandemic amplified existing inequalities in society. The aim of this scoping review was to explore what is known about the impact of the pandemic on kidney health inequalities specifically.

<u>Method</u>

The review was guided by Arksey and O'Malley's[2] guidance. Comprehensive searches were conducted, limited to studies from the UK, related to kidney patients, health inequalities, and the COVID-19 pandemic. Searches were conducted in PubMed, CENTRAL and the WHO COVID-19 Research Database (includes Scopus, Web of Science, Embase, proquest, EuropePMC, medRxiv/bioRxiv). Articles were limited to English and published only since 2020. Duplicates were removed, and titles and abstracts screened for inclusion with full texts of relevant articles retrieved. Data were extracted and reported narratively given the aims of scoping versus other methodological approaches to evidence synthesis.

<u>Results</u>

A total of 1336 articles were screened, and thirty articles were included in the synthesis. The majority of studies (46.7%) clustered in one region: London. Most studies used observational designs, specifically observational cohorts and included in total more than a million patients with kidney disease. In relation to completeness of reporting demographics of patients that are important for considering inequalities, there was large variation. Ethnicity was reported in all bar five studies, deprivation was reported in 15 studies, and mental health comorbidity in one study. All studies reported sex or gender and age. Significant inequalities were reported primarily by age, with older patients being at greater risk of

hospital admittance, mortality and in some cases infection from COVID-19. In addition, several studies noted more infection rates by deprivation, especially more severe infection as well as greater infection rates for Black and Asian (especially South Asian) patients. There was inconsistency with the association between mortality and ethnicity, with greater mortality reported for Asian and Black patients in some studies only. Vaccine uptake studies showed that uptake was poorer and slower for younger, minority ethnic patients, and in addition to those in high deprivation, with severe mental illness, housebound or having end-of-life care.

Discussion

This review demonstrated how the pandemic has impacted inequality based on age, deprivation, ethnicity and health status, with poorer vaccine uptake, infection rates, admittance and mortality in some kidney patient communities. Reporting of key drivers of inequality needs to be more consistent. Future research should optimise outcomes working to redress disadvantage for patients who already carry the burden of disparity.

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Poster number: 296

Submission number: 323

A literature review of patients and carers experiences after an episode of AKI in hospital, and the role of social network members in supporting them?

<u>Mrs Becky Bonfield</u>

Association of Nephrology Nurses UK, Executive Board Member and Lead for Communities of Practice. UK Kidney Association, Co-Chair of AKI SIG Innovation and Improvement Workstream.. UK Kidney Association, Conference Committee member

Mrs Becky Bonfield

Biography
Becky is a NIHR Doctoral Research Fellow, with an interest in Acute Kidney Injury (AKI) and AKI avoidance, and the role that patients play in avoiding future AKIs. Becky's particular area of interest is the self-management and social network support of patients with AKI. Becky has several different national roles including the lead for Communities of Practice for the Association of Nephrology Nurses UK Executive Board. Becky is the co-chair of the UKKA AKI SIG Innovation and Improvement workstream.

Abstract

Introduction

There is little published literature about an individual's experience of AKI, how they self-manage, what social networks they utilise after an episode of AKI, and how these might affect outcomes. Supporting people following an episode of AKI can be challenging. In many healthcare settings there are not robust systems in place to ensure that people are informed and educated about the AKI and how they can protect against future complications, including further AKIs or CKD. People may lack awareness that they have had an AKI and what this implies for their health, including everyday changes that they may need to adopt (1,2,3). Awareness of AKI diagnosis may impact on people's ability to self-manage and utilise social networks to assist them in managing their health needs. There is a lack of awareness about the role of social networks, how they are mobilised or not for who and why.

Methods

This review was completed in line with PRISMA guidelines. Only published articles containing primary data were included in the review. Studies which recruited adult participants (aged 18 and over) who have experienced AKI were included. Eligible studies had to report peoples experience after an AKI as one of the outcomes of the study. Studies that included self-management or social networks within their data collection were also included. The review was not specific to gender, sex, ethnicity, age, or frailty and included people who had an AKI on a background of chronic kidney disease. The review was restricted to Western countries, where lifestyles, risks, prevention, treatment of AKI, and approaches to self-management and social networks were likely to be similar to those within the UK.

We identified published primary studies, text and opinion papers, and grey literature dedicated to the topic of self-management and social network support for patients after AKI. Searches were conducted electronically and manually; the latter was conducted by searching for relevant articles in the reference lists of the selected articles.

A 3-step search strategy was used in this review. An initial limited search of MEDLINE (Ovid), Embase, Psycho info and AMED was undertaken to identify articles on the topic, followed by an analysis of the text words contained in the titles and abstracts of retrieved papers and the keywords used to describe the articles.

Results

31 articles were found after inclusion/ exclusion criteria applied. The full papers were then reviewed by the author and categorised into appropriate to the systematic review, potentially appropriate and not appropriate. This list was then reviewed by 2 supervisors and conflicts were discussed and resolved. There was a distinct split between a very small number of qualitative articles that reviewed patient and their social network experiences of AKI, and a larger number of articles that included self-management and social support within a quantitative study, utilising Health related quality of life measurements- specifically EQ-5D.

Discussion

It is currently unclear what role those people who have experienced an AKI may play in assisting to reduce the complications associated with their AKI. Preliminary results suggest that there are very articles that include assessment of self-management and the roles that social networks play in supporting patients after an episode of AKI in hospital, and the impact that this may have on patient outcomes. Full analysis will be presented at conference.

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Collaborative approach to patient safety for patient hydration. Understanding the extent of the problem.

Mrs Becky Bonfield[1], Jane Murkin[2], Jane Robinson[2], Bella Dorman[3], Dr Matthew Beresford[4]

[1]Association of Nephrology Nurses UK, Executive Board Member and Lead for Communities of Practice. [2]NHS England, Patient Safety team. [3]NHS England, Nutrition and Hydration Strategy Group N. [4]NHS England, Patient Safety Team

Mrs Becky Bonfield

Biography
Becky is a NIHR Doctoral Research Fellow, with an interest in Acute Kidney Injury and AKI avoidance. Becky works as an Acute Kidney Injury Advanced Clinical Practitioner and is passionate about hydration and fluid balance documentation. Becky has a number of different national roles, and has led the Acute Kidney Injury Community of Practice Group under the Association of Nephrology Nurses. Within this work the group carried out a survey regarding fluid balance documentation, which was shared with Ruth May, Chief Nurse from NHS England. This work led to Becky being invited to take part in the NHS England Patient Safety Team work that was leading the updating of the NHS England Nutrition and Hydration Policy. Becky has led the Implementation and Best Practice Guidance.

Abstract

Introduction.

The NHS is committed to providing high quality care that is safe, effective, and person-centered care building a culture of continuous improvement.

Poor fluid management is a common cause of in-hospital deterioration and a significant patient safety and quality of care challenge. Harm is not experienced uniformly but disproportionately affects certain patients, such as those who are frail, however robust data on the precise groups that are most at risk is lacking.

Methods.

In 2022 the Association of Nephrology Nurses UK (ANNUK) AKI Special Interest Group highlighted inpatient fluid balance monitoring and management as a recurring theme for concern. An AKI SIG ANNUK survey demonstrated 65% of units reported that they felt their fluid balance monitoring was inadequate. This report was highlighted to the NHSE Chief Nursing Officer, who was very supportive of national level improvement activity to responds to the report's findings.

Alongside the work carried out by the ANNUK AKI SIG the NHSE Nursing Directorate and Patient Safety Team were leading a national diagnostic phase of work to understand the extent of harm that was experienced due to problems with fluid management, identify recommendations and improvement interventions to address the related issues impacting on the quality and safety of patient care.

Results

The National Patient Safety team identified 4290 severe harm events related to fluid mismanagement (including failures to prevent or recognise fluid disturbances, as well as harm related to inappropriate treatments) through the National Reporting and Learning System. In work by Hogan et al (Hogan 2012) problems with drug or fluid management were identified in 20% of deaths deemed preventable at retrospective case record review.

Objective tools to measure the magnitude of fluid disturbances are lacking, and this complicates how the impact of improvement initiatives are monitored, as well as being a key driver of the issue itself. Grouping all types of 'fluid disturbance' under a single umbrella produces a natural tension between interventions targeted at preventing and treating fluid deficits with those targeting fluid excess. Reducing the incidence of one type of disturbance, without increasing the other, is fraught with difficulty. Harm can result from failures in prevention, recognition, and/or treatment, and it is important that there is clarity about the area being targeted. Fluid disturbances can also lead to harm outside the hospital setting, including in long term care facilities, and being clear about the healthcare setting being targeted is key.

Discussion.

Following the meeting between the ANNUK, CNO the Nursing Directorate agreed a priority programme of work to undertake a diagnostic phase of work to address the related safety issues and concerns. Within the presentation we will summarise the diagnostic phase of work that has been undertaken in relation to improving the management of fluid management in hospital inpatients. This will include the strategic relevance of this work, providing detail on the nature of the patient safety issue, including the uncertainties that exist and why improvement work in this area is challenging. We will discuss the implications of the outcomes of the diagnostic work and will include findings, improvement approaches and solutions to assist in reducing harm and improving the quality and safety of care for patients. We will also discuss how to embed improvement into the updated NHSE Nutrition and Hydration Policy and the introduction of the Best Practice and Implementation Guide.

Poster number: 298

Submission number: 350

A propensity score-matched analysis of kidney replacement therapy outcomes for older adults stratified by frailty severity

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Arya Pontula

Biography
Arya Pontula is a fourth year medical student at the University of Manchester Medical School and a research fellow within the Duke University Department of Surgery and Duke Ex-Vivo Organ Laboratory. She aims to pursue general or cardiothoracic surgery. Her research interests include investigating clinical outcomes of solid organ transplantation and she is passionate about using this research to improve clinical practice.

Abstract

Introduction

Older people living with frailty who receive kidney replacement therapy (KRT) experience higher mortality and hospital readmission compared to their non-frail counterparts (1-3). Shared decision making with older people regarding the optimal KRT modality (haemodialysis [HD], peritoneal dialysis [PD], or kidney transplant [TX]) can present challenges due to the lack of research comparing KRT modalities stratified by frailty severity. The Hospital Frailty Risk Score (HFRS), which uses routinely collected clinical data to categorise frailty severity, has been shown to predict outcomes in advanced chronic kidney disease (CKD) (4). However, the HFRS has not been used to compare outcomes across KRT modalities. This single-centre project aims to explore outcomes between KRT modalities for older people stratified by HFRS frailty severity.

Methods

Adults aged 60 years or older starting KRT at our institution between December 2012 and January 2022 were included. HFRS was calculated at first estimated glomerular filtration rate (eGFR) result below 15 mL/min/1.73 m^2 and at start of KRT. Patients were stratified by KRT modality and their frailty severity (categorized as low, intermediate, or high according to their HFRS score). TX patients were then matched to 1:2 to HD patients and 1:1 to PD patients, based on patient age, HFRS category, and Charlson Comorbidity Index (CCI) at KRT start. Outcomes of interest were hospital readmission and

mortality, both overall and within 1 year of KRT initiation. Descriptive statistics compared HD, PD, and TX groups.

Results

Twenty TX, 20 PD, and 40 HD matched patients were included. Age (HD vs PD vs TX: 68.5 vs 67.6 vs 68.3 years, p = 0.50), proportion of males (57.5% vs 70.0% vs 55.0%, p = 0.66), and CCI (15.0 vs 13.0 vs 13.0, p = 0.95) were similar between cohorts. Frailty, as assessed by the HFRS, worsened or remained the same for most patients in all 3 cohorts between first eGFR < 15 and KRT start (81.0% vs 93.0% vs 83.0%, p = 0.61). All patients were either of low (85.0% vs 80.0% vs 85.0%) or intermediate (15.0% vs 20.0% vs 15.0%) frailty status at time of KRT start and the proportion of patients in each category did not vary with modality (p = 0.92).

Re-hospitalization within 1 year of starting KRT was similar between groups (32.5% vs 25.0% vs 10.0%, p = 0.12). Kaplan-Meier survival analyses also demonstrated similar survival among groups at 1 year (75.0% vs 95.0% vs 90.0%, log-rank p = 0.09), but better survival among TX patients overall (0.0% vs 66.1% vs 79.4%, log-rank p = 0.02). Overall and 1 year Kaplan-Meier survival for patients stratified by KRT modality and HFRS are shown in Figure 1.

Discussion

TX may optimize longer term survival for older people with low and intermediate frailty status and kidney failure. Furthermore, the HFRS appears to be a useful prognostic tool that could inform shared decision making with older patients regarding KRT modality choice.
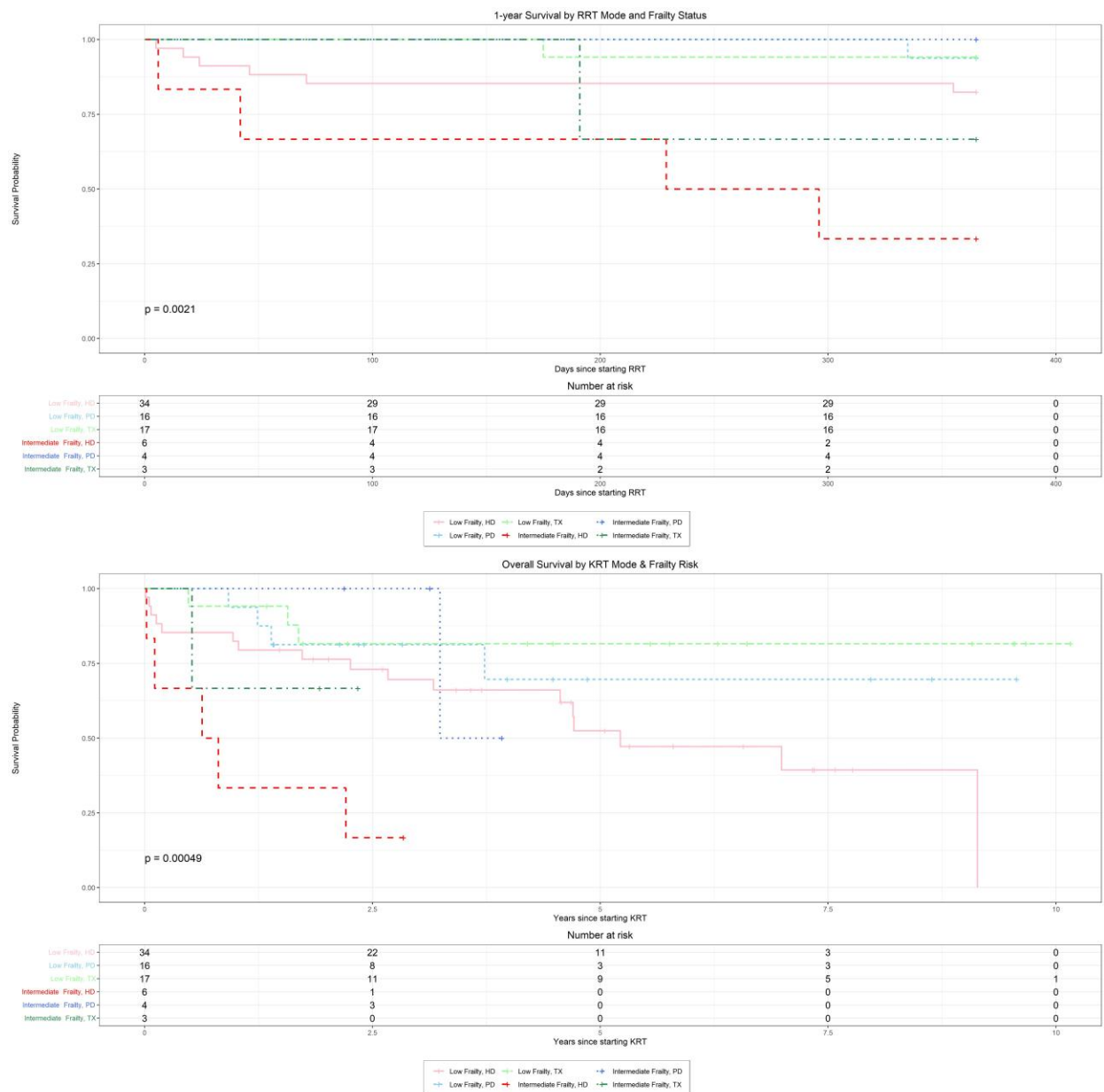
Figure 1. (A) One-year and (B) overall survival among HD, PD, and TX recipients stratified by HFRS frailty risk.

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Poster number: 299

Submission number: 108

Recruiting to a remote multicentre randomised control trial: the perceptions and experiences of research staff

Ms Gurneet Sohansoha[1,2], Dr Noemi Vadaszy[1,2], Ms Ella Ford[1,3], Dr Thomas Wilkinson[1,3,4], Dr Courtney Lightfoot[1,3], Professor Alice Smith[1,3]

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Ms Gurneet Sohansoha

Biography
I studied BSc Medical Sciences at university and have a clinical background working within the NHS. I am currently employed as a Clinical Research Assistant within the Leicester Kidney Lifestyle Team where I currently supports the clinical trial studies.

Abstract

Introduction

Remote trial methodology can provide a pragmatic, widely accessible and cost-efficient approach to the evaluation of appropriate interventions. We conducted a remote multicentred randomised controlled trial (SMILE-K) to evaluate a chronic kidney disease (CKD) self-management digital health intervention (My Kidneys & Me). SMILE-K had a pragmatic adaptive design with remote digital study processes to allow for minimal face-to-face participant contact. The perspectives of the research teams involved in clinical trials are valuable for improving the design and delivery of future remote trials. We conducted a qualitative study exploring research staff perceptions and experiences of recruiting to SMILE-K.

Methods

Clinical researchers at 25 recruiting sites across England were invited to take part. Semi-structured telephone interviews were conducted following the cessation of study recruitment. The interview topic guide explored participants' views on SMILE-K study processes, specifically recruitment to and delivery of the trial. Interviews were audio-recorded and transcribed verbatim. Data were analysed using thematic analysis.

Results

Thirteen participants comprising of Principal Investigators, research nurses, and research assistants (1 male and 12 females, mean years in current position:13 years (range:7-45)) were interviewed. Interviews lasted a mean of 30 minutes (range:20-47).

Six themes were identified:

- **Discordance between perceptions and experiences of recruiting participants**

Recruiting to a remote trial was expected to be easier and result in a higher number of recruits than traditional trials. Some participants reported unexpected challenges and struggles during recruitment.

- **Reallocation of available resources across research studies**

The remote study processes were described as "straightforward" and "easy to do", freeing up time and effort for more resource-intensive research studies e.g. COVID-19 studies.

- **More environmentally friendly**

Remote trials were considered environmentally friendly due to the reduced necessity for travel as well as electronic documentation which reduced paper use.

- **Onus on patients**

Participants discussed how after the initial invitation the online process was driven entirely by the patient which could potentially result in poorer engagement.

- **Engaging disadvantaged groups of patients**

The wide inclusion criteria of the trial were perceived to be inclusive, with the potential to engage a wide range of patients. Participants thought the study design could potentially disadvantage or exclude some patients, such as those with poor digital literacy, language barriers and disabilities. Research staff also reported having misconceptions about patients' age and related digital literacy.

- **Future considerations to improve recruitment**

Participants provided suggestions to improve the design and recruitment for remote trials including supporting disadvantaged groups and adopting a more personal approach to recruitment.

Discussion

This remote trial design was perceived by researchers to offer the potential to recruit a diverse and representative population, reduce the travel burden on participants, and be environmentally friendly. However, eliciting and maintaining interest from potential participants was considered challenging due to a lack of verbal communication with participants, misconceptions regarding age and digital literacy, and barriers to using the trial intervention such as low digital literacy and access to technology. These perspectives and experiences should be considered to improve the design of future remote trials to maximise recruitment and study delivery.

Poster number 300: WITHDRAWN

Poster number: 301

Submission number: 133

Blood pressure measurement in the clinic: does it matter which arm we use?

Dr Alexander Tham, Dr Mun Woo, Elizabeth Wilson, Julie Glen, Joanne Douglas, Julie Tortolano, Prof Colin Geddes

Queen Elizabeth University Hospital, Glasgow

Dr Alexander Tham

Biography
Dr Alexander Tham is a Foundation Doctor undergoing the Specialised Foundation Programme in research at the Queen Elizabeth University Hospital in Glasgow, and an Honorary Clinical Fellow at the University of Glasgow. Alexander Tham completed his medical training at the University of Glasgow and underwent an intercalated degree in Inflammation Medicine. He has a special interest in fibrosis and has been involved in both clinical and wet lab research in this topic. The research presented is from his time with the Glasgow Renal and Transplant Unit.

Abstract

Introduction

Interarm systolic blood pressure differences (IASBPD) are common; a difference of ≥10 mmHg is reported in 4-5% of disease-free patients, and 7-13% of patients with diabetes and hypertension. IASBPD is associated with an increase in cardiovascular and all-cause mortality for chronic kidney disease (CKD) and non-CKD patients and is an independent predictor of cardiovascular events in CKD patients.

Standardised office blood pressure measurement (SOBPM) technique is recommended in international guidelines and should include measurement in both arms on the first occasion to determine the correct arm for that individual in the future. This is seldom done in clinics due to infrastructure and time constraints. In 2022 we implemented SOBPM in three of our outpatient clinical settings; one general nephrology clinic, the autosomal dominant polycystic clinic, and the living kidney donor assessment clinic. The aim of this study was to assess the clinical implication of measuring IASBPD by SOBPM as per KDIGO guidelines in these outpatient clinics.

Methods

A retrospective comparison of CKD patients (n=205) and living donor candidates (n=97) who all underwent SOBPM using both arms was performed with living donor candidates regarded as healthy controls. Data extracted from the electronic record from the time of SOBPM measurement included age, sex, body mass index, diabetes status, kidney transplant status, eGFR.

Results

IASBPD ≥ 10 mmHg was observed in 54 (26%) CKD patients and 21 (22%) healthy controls.

IASBPD ≥ 10 mmHg was associated with higher median systolic blood pressure in both CKD patients (148 [interquartile range (IQ) 133-157] v 133 [123-144] mmHg; p < 0.01) and healthy controls (153 [145-163] mmHg vs 134 [124-142] mmHg, p <0.01), and with older age in healthy controls (55 [51-60] vs 48 [36-58] years, p = 0.04).

16% of patients with CKD had a systolic blood pressure ≥ 130 mmHg in one arm and <130 mmHg in the other arm.

Discussion

Our results show that IASBPD greater than or equal to 10 mmHg is common in both CKD and healthy patients, and more common than in previous published studies.

For a treatment systolic blood pressure target of <130 mmHg, 16% of patients are at risk of having an incorrect treatment decision depending on which arm is used on the day. Standardised blood pressure measurement technique can be implemented in routine clinics and has important therapeutic implications.

Systolic Blood Pressure Measurements in CKD Patients

- Both arms ≥130 mmHg: 50%
- Both arms <130 mmHg: 34%
- One arm ≥130 mmHg: 16%
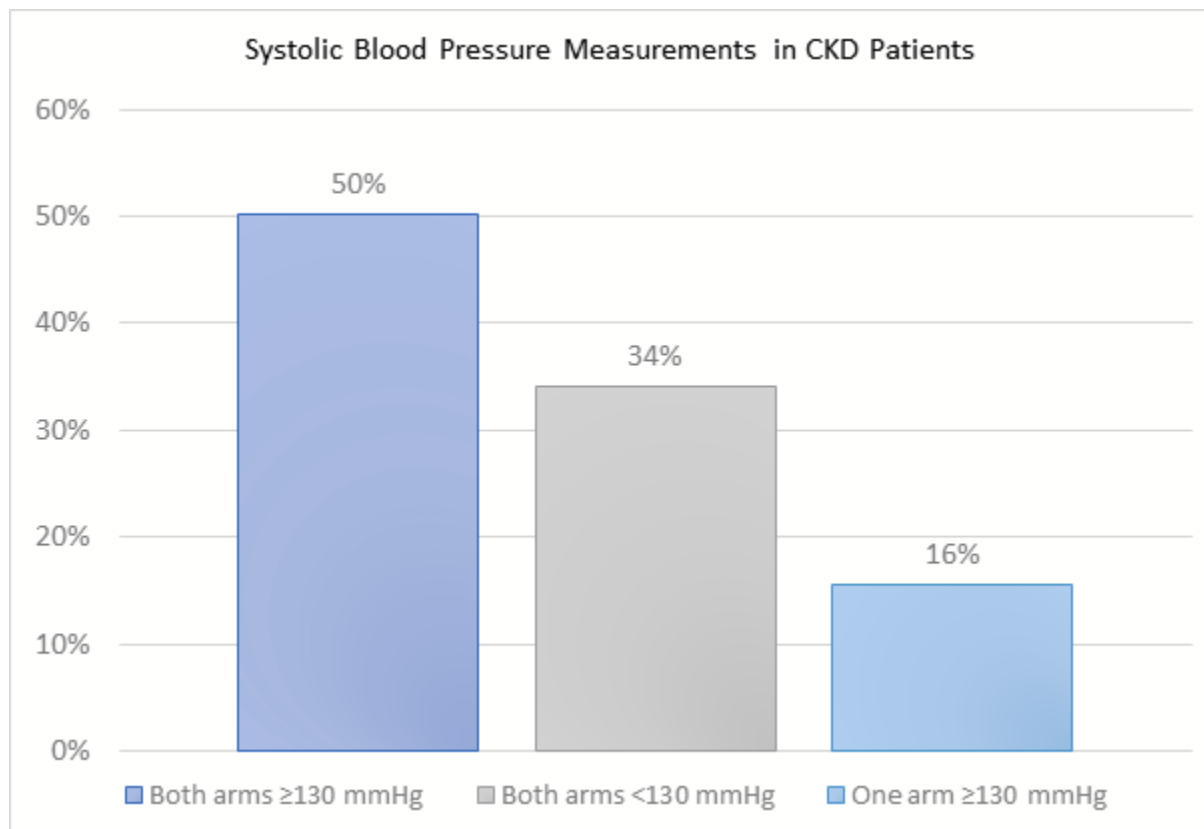
Poster number: 302

Submission number: 223

Monitoring of chronic kidney disease via the use of finger prick iohexol mGFR analysis.

Dr Reuben Roy, Professor Darren Green, Professor Philip Kalra

University of Manchester, Manchester

Dr Reuben Roy

Biography
MBChB, MRes, MRCP ST6 Trainee Renal Medicine North Western Deanery, England

Abstract

Introduction: Creatinine derived estimation of glomerular filtration rate (eGFR) is unreliable in many ethnic and socially vulnerable groups. The recommended correction of eGFR equations for black patients is now thought to lead to over-estimation of kidney function risking delayed referrals for advanced kidney care. Ultimately, there is the need for more frequent use of *measuring* rather than estimating GFR to ensure safe and timely treatment for people with chronic kidney disease, and to remove health inequalities in nephrology.

Determining measured GFR (mGFR) rather than estimating GFR in a clinical setting currently requires the use of isotope GFR scanning, which is time consuming, impractical and of relatively high expense.

The primary aim of this study is to show that determining iohexol mGFR can be undertaken with a high level of accuracy by healthcare professionals and patients together using microsampling test kits at home after an intravenous injection of iohexol at an outpatient appointment. A secondary aim is to demonstrate patient satisfaction with this process and willingness to adopt this as part of clinical care in advanced CKD.

Methods: The first part of this study involved recruiting inpatients admitted to our hospital under the care of our department. This was in order to validate the local microsample iohexol assay versus venous sampling assays and to undertake the first PDSA cycle QI evaluation of the home testing kits.

Patients recruited to the study received an intravenous 5 mL bolus of Omnipaque 300 (647mg/mL iohexol, GE Healthcare www.gelifesciences.com) followed by 10 mL of normal saline. This was followed by observation for 15 minutes and demonstration of the home testing kit, which consisted of three Mitra microsampling devices to enable finger prick blood sampling three, four and six hours post injection. A single plasma venous sample was taken at one of these time points to allow for validation of the assay.

The extraction and analysis of iohexol was undertaken using an in-house liquid chromatography-tandem mass spectrometry method (not published yet). GFR was then calculated from sequential iohexol levels from each blood spot using a standard 3 sample, 2 compartment model.

Results: A total of 21 patients were recruited to the first part of the study. Average eGFR (MDRD) was 29.5mL/min. No patients withdrew from the study.

Bland-Altman analysis comparing the Mitra finger prick iohexol to plasma venous iohexol demonstrated an excellent bias (0.5mcg/mL) and precision (standard deviation of the differences) (9.3 mcg/mL). r^2 (coefficient of determination) was similarly high (0.95) indicating low to minimal variance between the two test methods (figure below).

Patient satisfaction was relatively high. 17 out of 21 patients (81%) felt that the test was 'OK', 'easy' or 'very easy' to perform and 14 out of 21 patients (67%) agreed that they would be happy to perform such tests 'often' or 'frequently'.
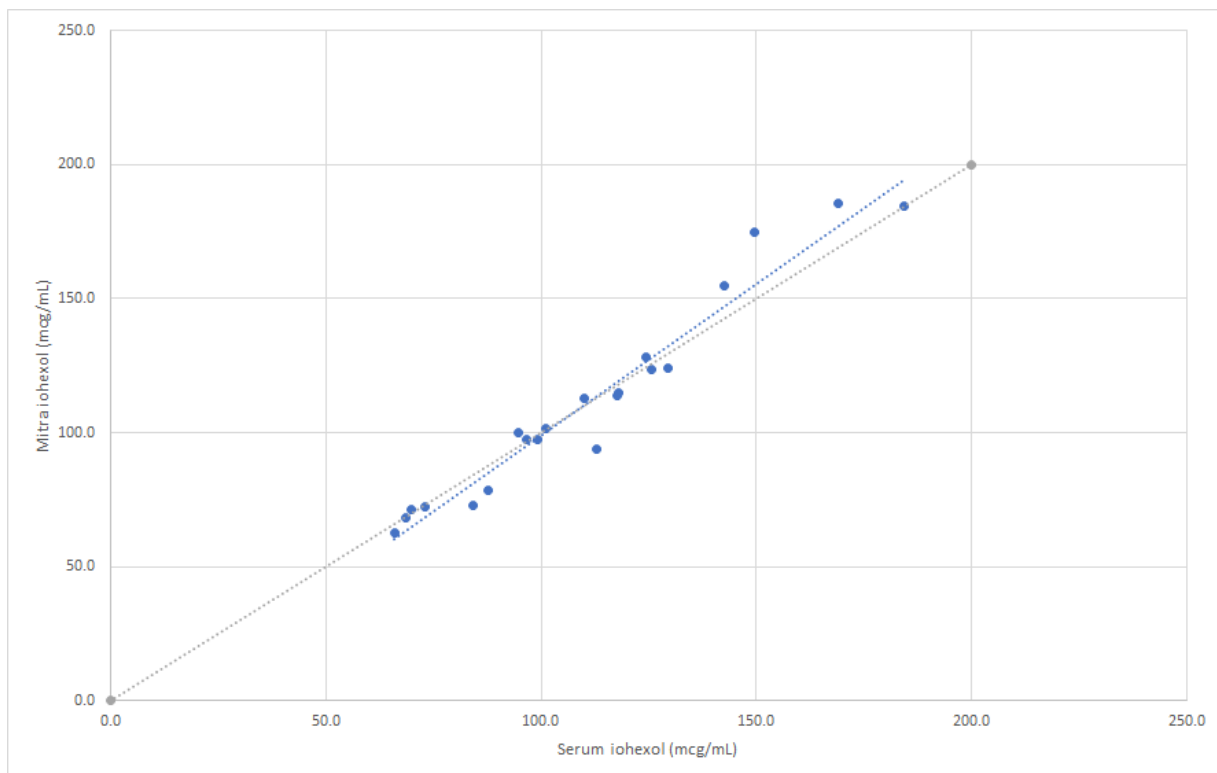
Discussion: The results of our pilot work demonstrate that patients are able to perform finger prick analysis using a microsampling devices without great difficulty and to some level of satisfaction.

The microsampling technology itself shows a high level of accuracy and is thus likely to play a role in future delivery of outpatient care for patients with chronic kidney disease with home monitoring being a distinct possibility.

We now plan to move this work into the outpatient setting and are preparing to recruit patients to this end.

References

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Study Registration Number

IRAS ID: 304466

Sponsor ID: S21KID09-S

Epigenetic profiles differ by level of kidney function in Idiopathic Nephrotic Syndrome.

Dr Samantha Hayward[1], Dr Matthew Suderman[2], Professor Gavin Welsh[1], Professor Moin Saleem[1]

[1]Bristol Renal, University of Bristol. [2]MRC-Integrative Epidemiology Unit, University of Bristol

Dr Samantha Hayward

Biography
I am a kidney doctor with an interest in genomics and molecular epidemiology. My PhD research focuses on people with Nephrotic syndrome; I am utilising machine learning to interrogate the genetic and epigenetic profiles of people with this kidney disorder to improve our understanding of disease drivers and our ability to predict prognosis.

Abstract

Introduction

DNA methylation (DNAm) is an epigenetic mechanism which can therefore induce changes in gene expression without any change to the underlying DNA sequence. Although generally quite stable, DNAm patterns in whole blood do vary across individuals, with DNAm levels associating with age and responding to environmental factors. We aimed to investigate whether peripheral blood cell DNAm associates with level of kidney function in patients with Idiopathic Nephrotic Syndrome (INS).

Methods:

Peripheral blood cell DNAm values were generated using the Illumina MethylationEPIC Beadchip (>850,000 CpG sites) for 293 INS patients recruited to the National Unified Renal Translational Research Enterprise–National Study of INS (NURTuRE- INS and NephroS). All patients were younger than 30 years old at INS diagnosis. An Epigenome Wide Association Study (EWAS) was performed using generalised linear models to evaluate associations between DNAm sites and estimated glomerular filtration rate (eGFR). Regions of differentially methylated sites were identified using the 'dmrff' R package. Sex chromosomes were excluded from the analyses and all analyses were adjusted for estimated cell type proportions, age, sex and technical variation. A Bonferroni adjusted p value of 5.88×10^{-8} was used as a significance threshold to adjust for multiple tests.

Results:

Of the selected 293 INS patients, 173 (59%) were male, 213 (73%) were white and the median age at INS diagnosis was 4 years old (IQR 2-10). One hundred and forty-three (48%) patients were steroid responsive at diagnosis and the remainder were steroid resistant. Sixty-eight of the steroid resistant patients had pathogenic NS variants.

We identified 6 CpG sites associated with eGFR ($p < 5.88 \times 10^{-8}$) in this cohort of INS patients, one replicating a previously reported association. We identified 3 differentially methylated regions, one coinciding with the transcriptional start site of an RNA binding protein which regulates alternative splicing, and another located in the body of a transcription factor regulator containing genetic variants associated with chronic kidney disease.

Discussion:

We have demonstrated variation in peripheral blood DNAm by level of kidney function in children and young adults with INS. Associations between DNAm and eGFR have previously been demonstrated in diabetic kidney disease and heterogenous chronic kidney disease cohorts, including one of the sites which we have identified in our study. Further work is underway to determine if these differences in DNAm are likely to be a cause or consequence of reduced kidney function, which will help to determine their potential clinical utility.

Figure 1. Associations between DNA methylation
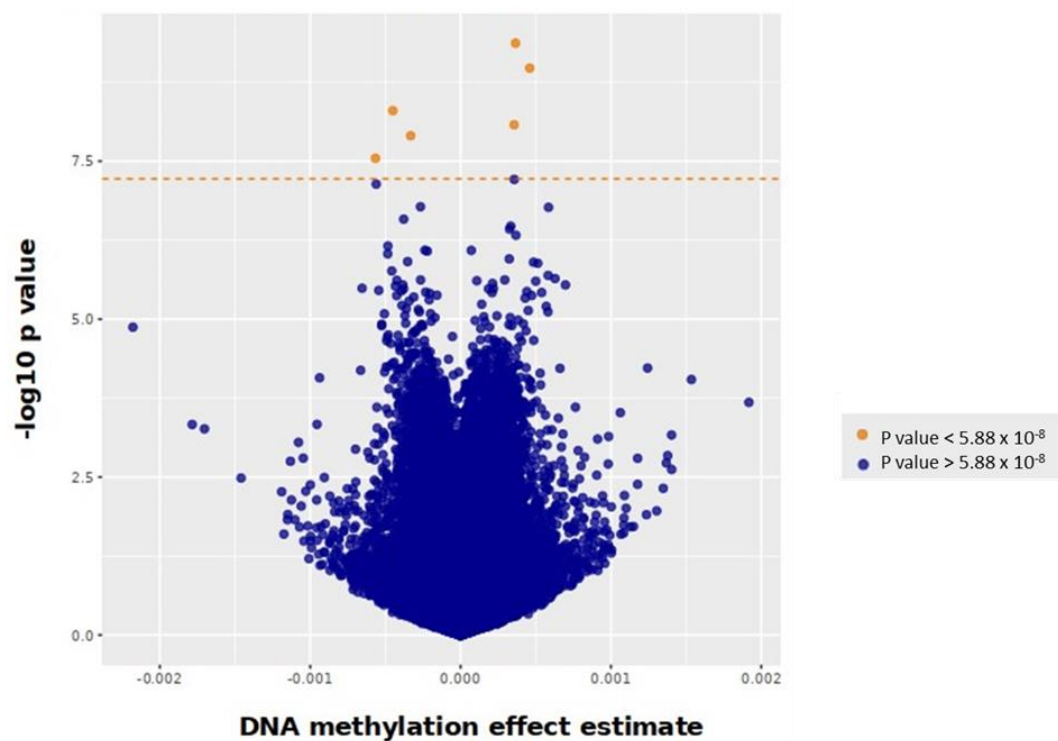
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Poster number: 304

Submission number: 279

Mapping serum creatinine in healthy pregnancy to define normal ranges and identify clinical risk-early results from the UK acute kidney injury in pregnancy cohort study

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Dr Laura Skinner

Biography
Laura Skinner MRCP (Nephrology) is a specialist registrar in renal and general internal medicine at North Bristol NHS Trust and a British Heart Foundation doctoral clinical fellow at the University of Bristol, with a specialist interest in pre-eclampsia and renal disease in pregnancy.

Abstract

Background

Physiological changes in healthy pregnancy result in a fall in serum creatinine, however, available reference ranges for UK women are derived from small studies. Outside pregnancy, acute kidney injury (AKI) is defined as a rise in creatinine of ≥26 µmol/L within 48hrs.[1] Diagnostic criteria for pregnancy-related AKI (PR-AKI) are ill-defined, but its incidence appears to be increasing.[2] PR-AKI is associated with 13.5-fold higher mortality and 10-fold greater risk of cardiovascular events.[2] A recent systematic review identified creatinine >77µmol/L in pregnancy as abnormal.[3]

Methods

The Acute Kidney Injury and Late Diabetes in Pregnancy (AKID; IRAS ID246444) was a prospective cohort study of pregnant individuals ≥16 years, without CKD or diabetes, receiving maternity care in our centre, between December 2019-October 2021. Serum creatinine was measured at booking, 28 weeks, 36 weeks, at birth and postpartum and adverse pregnancy outcomes (APOs) recorded. Creatinine trajectories throughout pregnancy in normotensive participants and in those with a hypertensive disorder of pregnancy, HDP, were compared.

Results

480 participants were recruited. Mean creatinine was 52µmol/L, 48µmol/L, 51µmol/L and 59µmol/L at booking, 28, 36 weeks and postpartum, respectively. In 9.2% creatinine increased to >77µmol/L and this occurred most frequently at birth. A rise in creatinine ≥26 µmol/L occurred in 2.5% between 36 weeks and birth. 2.6% with a repeat creatinine did not recover kidney function. Clinical recognition of creatinine elevation occurred in 31.9% cases.

Gestational hypertension occurred in 5.2% and pre-eclampsia in 2.7%. Comparison of creatinine trajectories between normotensive women versus those with HDP, suggest that creatinine is elevated in those with HDP from early pregnancy, prior to disease onset.

Discussion

This study is the largest prospective examination of kidney function in pregnancy in the UK population. Most women with a creatinine ≥77µmol/L recovered renal function post-partum. Despite recovery, recognition of these women remains clinically important as evidence suggests they are at increased risk of pre-eclampsia, prematurity and small for gestational age neonates in subsequent pregnancies.[4] On-going analyses will determine references ranges for creatinine in pregnancy, further examine the association between change in creatinine and APOs and propose a definition of PR-AKI. Improved understanding of kidney function in healthy pregnancy, will aid in the identification and diagnosis of AKI in pregnancy to ultimately improve outcomes.

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Study Registration Number

IRAS ID246444

Poster number: 305

Submission number: 88

Serum osmolality testing in severely hyponatremic patients and preserved GFR is associated with improved 30 day mortality.

Dr Oliver Fox[1], Mr Thomas Ash[2], Dr Kristin Veighey[3], Mr Cai Davis[3]

[1]Whittington Health Trust, London. [2]UCL, London. [3]University Hospital Southampton, Southampton

Dr Oliver Fox

Biography
JCF in Emergency Medicine

Abstract

Introduction

Despite UK guidelines advocating paired osmolalities and urinary sodium, inadequate investigation of hyponatremia is common. Although many hospitals suggest serum osmolality as an initial test, it is unclear whether this approach improves outcomes. We have built a logistic regression model to explore the association between serum osmolality (sOsm) testing status and mortality in severely hyponatremic patients. We also examined renal function to identify if this conferred greater risk.

Method

We analyzed sodium values on admission from 87,174 patients in a large UK tertiary hospital. We extracted U/E, measured osmolalities, age, and blood glucose. Since we wanted to isolate the effect of a sOsm test, it was important to control for its value. In the absence of a measured osmolality, we therefore derived a calculated osmolality using the first glucose and urea available within 24h. We validated this by regressing 753 measured and estimated osmolalities ($R2 = 0.6958$, $p < 0.001$). 30-day-mortality was modeled with covariates 'Sodium Result', 'sOsm value (calculated if measured not available)', 'age', 'GFR' and an interaction term identifying if testing was associated with improved mortality when sodium was <126meq/L.

Results

Testing for serum osmolality in patients with sodium values <126meq/L was associated with lower 30 day mortality (coefficient = -1.527, $p<0.001$), as was preserved eGFR ($p<0.01$) and younger age ($p<0.001$). Of 1187 patients with Na+<126meq/L, just 39.4% received a sOsm test within 7 days of admission.

Discussion

In this large hospital cohort, a low proportion of patients received a serum osmolality when severely hyponatremic. Performing serum osmolality testing is associated with lower 30 day mortality. Patients with impaired renal function were at increased risk. Not being able to identify patients who were admitted for palliation or identifying further clinical predictors of mortality were important limitations.

Conclusion

This is the first large study where sOsm has been calculated in place of a measured value to model the impact of the test itself on outcomes, a technique which could be used on other datasets. The results of this analysis have led to the adoption of an electronic alert to prompt sOsm testing, the impact of which will be measured in 3 monthly intervals.

Poster number: 306

Submission number: 381

CAR T-cells targetting FAP and uPAR does not alleviate UUO-induced kidney fibrosis in mice

Dr Mark Richards[1], Ms Naomi Hamada[2], Miss Lorraine Miller[3], Dr Lihuan Liang[1], Ms Lori Clarke[2], Ms Diana Moffat[2], Prof. Yasuhiro Ikeda[4], Dr Shrikant R Mulay[1], Prof Pernille BL Hansen[5], Dr Kevin Woollard[1]

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Dr Mark Richards

Biography
I obtained by PhD from the Unviersity of Bristol in 2016, specialising in cellular and molecular biology. Subsequently, I conducted my post-doctoral education a Uppsala University, investigating microvascular dysfunction. In 2022 I joined AstraZeneca as a senior scientist in renal biology.

Abstract

The expansion of senescent cells and myofibroblasts is a major feature of progressive kidney disease through the potentiation of inflammation and fibrosis, and therefore, are considered as attractive therapeutic targets. We hypothesised that chimeric antigen receptor (CAR) T-induced depletion of these cells will alleviate kidney fibrosis. Human and murine RNAseq datasets highlight the specific and enhanced expression of Fibroblast activation protein (FAP) in kidney myofibroblasts during disease. Furthermore, recent literature has identified urokinase plasminogen activator surface receptor (uPAR) as a broad marker of senescent cells. Here we aimed to investigate the ability of CAR T-cells targeting FAP and uPAR to clear myofibroblasts and senescent cells, respectively, from kidneys, and thus reduce fibrosis. At first, we generated CAR T-cells recognizing uPAR and FAP were generated from syngeneic T-cells through viral transduction and confirmed to target and clear uPAR and FAP-expressing cells in *vitro* and *in vivo* syngeneic tumours. Second, kidney fibrosis was induced in mice by unilateral ureteral obstruction (UUO), which upregulated *Plaur* and *Fap* gene expression in kidneys. This was also associate with a robust increase in inflammation and fibrosis over 14 days, as evident from gene and protein expression of αSMA, Fn1, Col1a1 and IL6. Next, we treated UUO mice with anti-uPAR, anti-FAP CAR T-cells, and un-transduced control cells post-operatively at days 3 and 10. An ALK5 inhibitor was used as a positive control. We observed significant decrease in renal expression of αSMA, Fn1, Col1a1 and TGFβ upon treatment with ALK5i, but not with either anti-FAP or anti-uPAR CAR-T cells. Therefore, we conclude that CAR T-cells targetting FAP and uPAR does not alleviate UUO-induced kidney fibrosis in mice under conditions tested. Future work is needed to address the potential reasons for the lack of efficacy, which might include, but are not limited to, timing of treatment and lack of translatability of *Plaur* and *Fap* gene expression and their proteins cell surface expression for CAR-T mediated cytotoxicity.

Poster number: 307

Submission number: 395

Artesunate Ameliorates Kidney Fibrosis by Suppressing Wnt/β-Catenin and STAT3 Signalling Pathway.

Dr Goran Mohammad, Mr Julius Kieswich, Dr Abhishek Kumar, Dr Kieran McCafferty, Professor Christoph Thiemermann, Professor Muhammad Magdi Yaqoob

Centre for Translational Medicine and Therapeutics / The William Harvey Research Institute / Queen Mary University of London, London

Dr Goran Mohammad

Biography
I completed my PhD in Biomedical Science at University College London in 2016 under supervision of Professor Stephen Pereira and Dr Dipok Dhar, where I investigated the role of metabolic enzymes in progression and development of pancreatic cancer, specifically I studied the PKM2 and LDH-A enzymes as a diagnostic marker and therapeutic target for pancreatic cancer. After PhD graduation, I joined prof. Lakhal-Littleton's group at department of Physiology, University of Oxford, as a Postdoctoral Research Assistant. Projects were focused on the role of hepcidin and ferroportin in the intracellular and extracellular iron homeostasis, and its effect on the human health. My project was focused on the study of the role of hepcidin/ferropertin axis in iron regulation in the heart, kidney, placenta, and vasculature, by utilising novel animal models of tissue-specific alterations in iron metabolism. Recently, I joined prof. Magdi Yaqoob's group at William Harvey Research Institute, Queen Mary University of London. Our group focusing on treatment and mechanism of chronic kidney disease (CKD) and how to stop the progression of CKD to kidney failure and fibrosis. I am currently focusing on the study of treatment and mechanism of kidney fibrosis both in animal model and human primary fibroblasts cell.

Abstract

Introduction: Chronic kidney disease (CKD) is a global health issue with high co-morbidities and mortality. The disease poses a serious risk to human health and often progresses to renal failure and premature death (1). Regardless of the causes of CKD, kidney fibrosis represents the final stage of renal disease which is characterised by excessive deposition of collagen and extracellular matrix (ECM) leading to impairment of renal function and accumulation of toxic waste products (2). The ECM accumulates in the space between tubules and the peritubular capillaries, causing impairment of renal function and irreversible nephron loss (3). Currently, there is no effective treatment for CKD, the only option being kidney transplantation or dialysis to reduce build up of toxic waste products. Artesunate is an anti-malaria drug, and it has shown anti-fibrotic effects in multiple animal models such as ocular (4), liver (5) and epidural fibrosis (6). However, the efficacy of Artesunate in the setting of CKD and renal fibrosis has not been explored, therefore, the efficacy of Artesunate will be evaluated in this study.

Method: The effect of Artesunate was investigated in two models of renal fibrosis, uniliteral ureteral obstruction (UUO) in mice and the effect of Artesunate in human primary fibroblasts (HKF) cell culture. Further mechanistic investigation, immunoblot analysis, immunohistochemistry, gene expression assay, ELISA and other tools have been used to study the underlying molecular mechanisms of antifibrotic effects of Artesunate.

Results: The results of our study showed that Artesunate ameliorated the expression of transforming growth factor beta (TGF-β), a master regulator of kidney fibrosis, in the UUO mouse model, and alleviated the expression of fibrosis markers alpha- smooth muscle actin (α-SMA), fibronectin, collagen I and vimentin, in both the in vivo and in vitro kidney fibrosis models. Further mechanistic investigation showed that Artesunate treatment abrogated the TGF-β/SMAD pathway. Additionally, in the UUO model, Artesunate treatment attenuated the Wnt/β-Catenin pathway and alleviated the accumulation of β-Catenin. In both in vitro and in vivo models, STAT3 phosphorylation was reduced. Furthermore, we saw that Artesunate treatment inhibited cell proliferation in the UUO model and induced ferroptosis in cultured human kidney fibroblasts.

In conclusion, our study demonstrated that artesunate treatment was able to improve renal function and protected the kidney against fibrosis in two renal fibrosis models by abrogation of fibroblast activation, attenuation of both canonical and non-canonical TGF-β pathways, and inhibition of cell proliferation. In addition in cultured human kidney fibroblasts it induced ferroptosis. Thus Artesunate may offer a potential treatment for kidney fibrosis in the future.

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Improving identification and preventing progression of chronic kidney disease in primary care through an iterative, multidisciplinary co-design process.

Mr Matthew Wyatt[1], Dr Neville Purssell[2], Dr Andrew Frankel[3,4], Joana Teles[3], Dr Tony Willis[2], Livi Bickford-Smith[5]

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Livi Bickford-Smith

Biography
Livi Bickford-Smith is an innovation service designer specialising in primary care clinical pathways. She has worked in the North West London Academic Health Science Network (AHSN) consortium 'DiscoverNOW' since 2020. She led the overall design strategy of the DiscoverNOW project focused on improving the identification and prevention of CKD progression in North West London (NWL).

Abstract

Chronic kidney disease (CKD) poses a significant public health challenge and is particularly relevant to the population of North West London (NWL). The majority of clinically at risk patients are not routinely screened in primary care. Those who are screened, often remain undiagnosed and unoptimized even with results indicating CKD until the disease progresses to advanced stages. The associated complications contribute to a substantial economic burden on the local Integrated Health System (ICS).

This project aimed to gain an in depth understanding of the barriers facing primary care clinicians and people with CKD in the early care pathway and co-produce effective solutions to address these barriers.

Evidence shows a multi-dimension approach is required for the successful transformation of a complex system. We created multi-agency partnerships between academia, public health, clinical networks, industry, primary and secondary care clinicians and patients to enable top down and bottom up transformation of early CKD care. A mixed-methods quality improvement action research approach was used with a focus on human centred design thinking. Steps one to three were completed from April 2022-November 2023. Step four is in progress as of January 2024.

1. Identification of opportunities and barriers to patient identification and optimisation through pathway mapping and semi structured interviews
2. Co-producing ideas to address priority areas
3. Idea iteration and testing feasibility of prototype solutions
4. Solution rollout and evaluation using real world evidence

The project's main findings and outcomes included:

- People with a CKD clinical risk factor and people diagnosed with CKD are not aware of the implications of a urine ACR test and are less likely to be tested if they don't bring a morning urine sample to their practice
- People with type 2 diabetes are the only clinically at risk cohort routinely invited to urine ACR testing in primary care
- People with test results indicating CKD are often not formally coded in primary care due to clinician uncertainty over coding options
- CKD reviews in primary care are uncommon and optimisation of CKD treatment is not focused when patients have other cardiorenal metabolic conditions

The following solutions were co-designed and made available to primary care to address the above findings:

- Searches to identify individuals on a practice list requiring screening, coding and treatment optimisation
- Visualisations dashboard to prioritise patients for action
- Automated pathology lab guidance to support coding decisions
- CKD electronic patient record (EPR) management template to integrate CKD optimisation into existing long term condition reviews
- Primary care referral to virtual patient education session and other educational content for early CKD

Two example of interim testing results for the virtual patient education session.

1. A total of 158 patients have attended the session between April 2023 and November 2023 with representation from all eight boroughs.

Area	N	Av. age	Age range	Gender	Av. IMD	IMD Range	Language
Total (Inc. out of area)	143	65	26-88	55% Female 45% Male	5	1-10	79% Unrecorded 9% English 12% Non-English
Hillingdon	32	68	32-83	26% Female 74%Male	6	2-10	87% Unrecorded 6.5 % English 6.5% Non-english
Harrow	26	63	26-88y	44% Female 56% Male	7.2	4-10	96% Unrecorded 4% English
Brent	27	61	33-84	54% Female 46% Male	3.5	1-8	77% Unrecorded 8% English 15% Non-English
Hounslow	12	64	30-86	33% Female 67% Male	5	3-8	58% Unrecorded 42% Non-English
Ealing	20	68	48-82	50% Female 50% Male	6	2-9	85% Unrecorded 15% Non- English
Hammersmith and Fulham	6	56	47-71	17% Female 83% Male	3.3	2-7	57% Unrecorded 14% english 14% Non- English
Kensington and Chelsea	4	72	66-82	25% female 75% Male	4	1-5	75% Unrecorded 15% English
Westminster	4	76	68-85	50% Female 50% Male	5	2-9	50% Unrecorded 50 % English

2. Patient attendance the primary care pathway increase from 10% April-July 2023 to 21% Aug-Nov 2023

Month	Virtual Clinic	Nephrology	GP		
April	7	0	1		
May	9	0	1		
June	7	0	2	Apr-July	
July	10	1	0	Total N38 87%-VC, 3%-N, 10% GP	
August	18	4	2		
September	7	6	7	Aug - Nov	
October	22	7	5	57%% VC 21% N 21% GP	
November	12	5	8	Total N 103	
December					
				Total = 65% VC 18% GP 16% N	

Chart Title — Virtual Clinic, Nephrology, GP
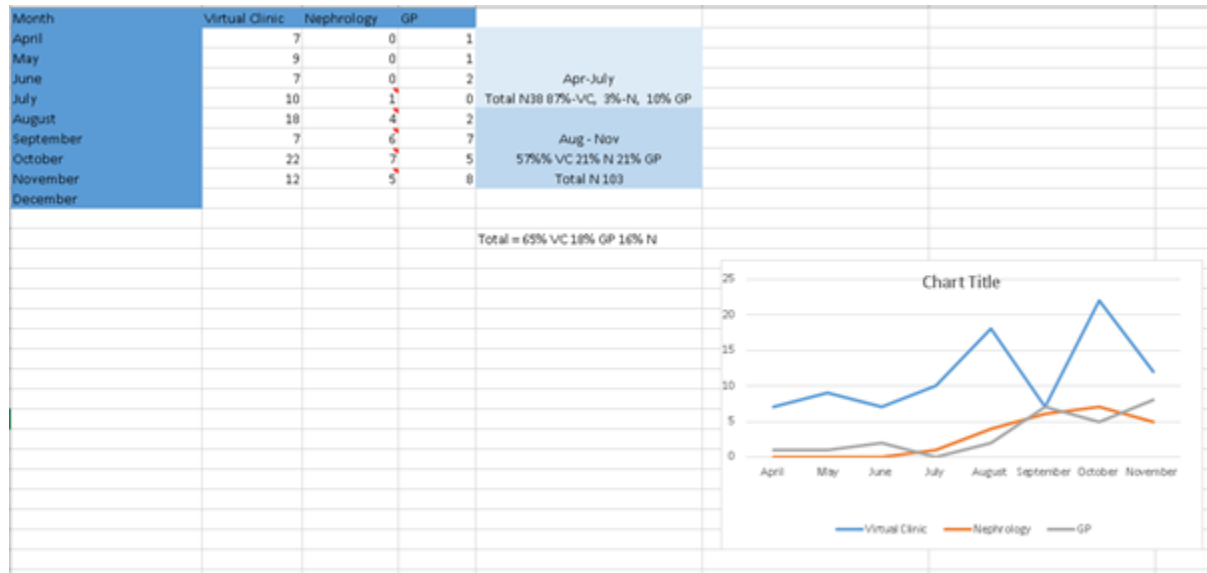
Solutions are being evaluated against quality metrics for early CKD and rate of adoption in primary care.

The project has resulted in solutions that target the actual challenges experienced by primary care clinicians and people with CKD in the recognition and effective treatment of CKD. The solutions are integrated into existing pathways such as type 2 diabetes and hypertension. This will enable primary care to move away from costly siloed management of long term conditions to a patient centred model.

Poster number: 309

Submission number: 530

Resolving an inflammatory, senescence-related cell state as key mediator in human kidney disease

Maximilian Reck, Dr Bryan Conway

Centre for Cardiovascular Science, Edinburgh

Maximilian Reck

Biography
I am a PhD student at the University of Edinburgh, Centre for Cardiovascular Science, studying kidney diease pathology. I am interested in applying single-cell and spatially omic techniques to gain insight into molecular mechanisms of human CKD development.

Abstract

Development of novel therapeutics for chronic kidney disease relies on detailed understanding of complex interactions of cell types and cell states in their tissue context. Previous studies using single-cell genomics have implicated maladaptive repair in subset of injured proximal tubule (PT) cells with incomplete tissue repair in a range of mouse models of AKI and CKD. However, currently there is knowledge gap how PT maladaptive repair translates to human kidney disease and if maladaptive repair has functional implications for disease pathology.

To this end, we performed paired snRNA-seq and snATAC-seq on human kidney tissue from patients undergoing tumour nephrectomy, where the ureter was either obstructed by tumour or remained unobstructed. We observed comparable cellular phenotypes and molecular pathways to those identified in patients with diabetic and hypertensive kidney disease, suggesting that they represent a stereotypical response to tubular injury. In obstructed kidneys a discrete subset of proximal and ascending thin limb of loop of Henle tubular cells acquired a pro-inflammatory phenotype in association with markers of cellular senescence which was distinct from epithelia with a generic injury transcriptome. Ligand-receptor analysis identified pleiotrophic signaling pathways from the pro-inflammatory phenotype to monocytes, macrophage, T-cells and fibroblasts to mediate leucocyte recruitment and myofibroblast activation. To confirm the pathological relevance of the inflammatory phenotype, we performed high-plex molecular imaging with single-cell resolution and localized the inflammatory phenotype to the inflamed fibrotic niche. Furthermore, the proportion of inflammatory tubular cells inversely correlated with eGFR.

To understand the gene regulatory underpinnings activating an inflammatory phenotype we leveraged the paired chromatin accessibility data. We constructed gene regulatory networks by correlating chromatin accessibility and transcription factor (TF) binding sites with gene expression. Using this approach, we identified the collapse of a HNF4A-driven network as a central feature causing the downregulation of key PT genes. Simultaneously, we identified AP-1 and NF-κB TF motifs as the key transcription factors activating a pro-inflammatory and senescence gene program. Finally,

administration of a small molecule AP-1 inhibitor in a murine model of ischaemia-reperfusion injury ameliorated renal injury, inflammation and fibrosis and decreased expression of predicted AP-1 target genes.

In conclusion, we identified a subset of PT cells in injured human kidneys which exhibited a pro-inflammatory, senescence-like phenotype and localized to the fibrotic niche and validated AP-1 as a key transcription factor promoting this cell state to mediate kidney inflammation and fibrosis. Taken together, we comprehensively describe the spatially resolved transcriptome, epigenome and cellular interactions of a novel cell state and our Multiomic atlas will be a key resource for further research into the pathophysiology of human kidney disease to reveal new therapeutic strategies.

Poster number: 310

Submission number: 169

Implementing Online Space for Awareness and Research – Paediatric and Adult Nephrology Perspectives

<u>Mr Shahid Muhammad</u>

Coventry University, Coventry

Mr Shahid Muhammad

Biography
I am an Author, Specialist Biomedical Scientist, HCPC Scientist, Chartered Scientist, writer, presenter, Academic Lead, lecturer, supervisor, researcher, blogger, and Finalist for Scientist of the Year under Advancing Healthcare Awards (2018), (2022), Jenny Kitsen Safety Award Winner (2022) Winner, Royal Society of Medicine (RSM), Nephrology President's Day Prize Presenter (2022), Jenny Kitsen Safety Award Winner (2023) and shortlisted for the Synnovis Award for Innovation in Healthcare Science, under Advancing Healthcare Awards (2023). I am the Chief Scientific Officer (CSO) for the Renal Patient Support Group (RPSG) and acting Academic Lead for the Kidney Disease and Renal Support (KDARs) Group for Kids. I am a Fellow for the Institute of Biomedical Sciences (FIBMS) and a Chartered Scientist under the Science Council (CSci). My experience surrounds Paediatric Nephrology, Blood Sciences and General Pathology. I have acquired skill-mix across scientific practice. I have been involved in the development of key practices through several working groups/ panels. I was a member for the NHSBT Paediatric Kidney Advisory Group (PKAG-sub-committee 2009-2011) and was a member of the British Association of Paediatric Nephrology (BAPN) (2011-2014).

Abstract

Introduction:
Online Spaces have allowed patients with Long-Term Conditions to access information through websites, portals, and patient-centred organisations. This work looks at retrospective pilot descriptive analysis of tagged themes between two online social media platforms, to understand how healthcare service between online and physical space, service users and providers, can be enhanced.

Methods:
Between two research social media platforms (i.e., the Renal Patient Support Group and the Kidney Disease and Renal Support Group for Kids), initially co-developed themed topic tags, which had been applied against threads. Thereafter, a target sample was implemented to seek 100 responses between two surveys, one for Patients and a second one for Allied Health Professionals (AHPs) to understand how healthcare service for patients could be enhanced. Survey URLs/ links for participants to complete were actioned through RPSG platform. Participants were invited to complete survey only once. Qualtrics software was used to analyse data.

Results:

19 surveys were completed by Allied Health Professionals (AHPs) and 45 were completed by CKD patients. The highest responses were from Allied Health Professionals (AHPs) were Female (57.14%) vs. Males (42.86%). Relating CKD Patients, Females (55.00%) vs. Males (38.89%). Types of AHPs included: Healthcare Scientists (47 %), Nephrologists (17.65 %), AHPs (17.65 %), GPs (5.88 %) and patients cohort included: Transplant Patients (60.53%), Haemodialysis Patients (13.16%), and CKD Patients (stages 3-5) (10.53%).

Discussion:

This is the first international pilot retrospective investigation that examines a need for patient and healthcare professional involvement through social media and/ or online space, and between paediatric and adult nephrology cohorts.

Keywords:

Chronic Kidney Disease, Social Media, Nephrology, Paediatric Nephrology

Best practice for the selection, design and implementation ok UK Kidney Association guidelines: a Delphi consensus approach.

Professor James Burton[1], Dr Joe Chilcot[2], Katie Fielding[3], Dr Andrew Frankel[2], Niraj Lakhani[1], Pam Nye[4], Kathrine Parker[5], Dr Will Priestman[6], Fiona Willingham[7]

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Professor James Burton

Biography
James is Professor of Renal Medicine and a Consultant Nephrologist in Leicester as well as the medical Clinical Vice President of the UK Kidney Association.

Abstract

Introduction

Evidence-based practice, using guidelines supported by research, is at the heart of modern clinical practice. Whilst there has been much research into how to effectively develop and implement evidence-based recommendations into clinical practice, there is no overarching standard for this. What is clear from the available literature is a need for effective and transparent engagement with stakeholders, to help develop guidelines which are simple and practical. This research, undertaken on behalf of the UKKA Clinical Practice Guidelines Committee, aimed to gather consensus from healthcare practitioners, patients, and patient representatives on what constituted best practice for guideline development and implementation, and how the organisation could practically align itself to these ideals.

Methods

A multi-disciplinary panel of experts in kidney healthcare from across the UK developed 35 statements on the issues surrounding the selection, development, and implementation of nephrology guidelines. Following a modified Delphi methodology, consensus with these statements was determined by agreement using an online survey. Two surveys were created, one with all 35 statements distributed to healthcare practitioners, and a second condensed survey of 20 statements circulated to people with kidney disease and their families. The consensus threshold was defined as 75% agreement.

Results

419 responses were received. Of the 364 healthcare practitioners, a significant number had over 20 years of experience in their role (n=123) and most respondents were nephrologists (n=95). Of the 55 non-clinical respondents, the majority were people with kidney disease (n=41) and the rest their carers or family. Participants were from across England, Northern Ireland, Scotland, and Wales. Consensus between healthcare practitioners was achieved in 32/35 statements, with 28 statements reaching ≥90%

agreement. Consensus between patients and patient representatives was achieved across all 20 statements, with 13/20 reaching ≥90% agreement.

Discussion

The current results have provided the basis for six recommendations for improving the process by which the UKKA selects, designs, and implements its guidelines (see table). It is hoped that actioning these recommendations will help improve the accessibility and engagement with clinical guidelines, contributing to the continuing development of best practice in UK kidney care.

RECOMMENDATIONS:

Based on the levels of consensus seen within this study, the Steering Group were keen that the UKKA's process for creating guidelines should be updated in response to the results of this work. As such the steering group posed the following recommendations:

1. A more equitable approach to proposing guideline topics should be adopted, allowing input from HCPs, patients, and their representatives
2. UK commentaries on international guidelines that outline regional applicability and more focussed implementation are as valued as full UK guidelines
3. All guidance should focus on the end user, with simple and appropriate language to ensure accessibility for HCPs and people with CKD, and encourage engagement
4. Standardised, multi-faceted implementation techniques or 'practice points' to maximise the uptake of their recommendations into clinical practice should be developed and included
5. Connections across disciplines should be fostered, not only to ensure a multi-disciplinary approach to their guideline development but ensure perspectives from nephrology are considered in CPGs created by other professional bodies
6. Guideline groups should outline strategies to address the sustainability agenda, wherever possible

Utilising the complexity of renal medicine to co-develop an effective, clinically orientated, electronic patient record system for the NHS.

<u>Dr Gang Xu</u>, Dr Tim Bourne, Mr Aaron Vogel, Mr Graeme Hall, Mr Andrew Carruthers

UHL, Leicester

Dr Gang Xu

Biography
Gang Xu is transplant nephrologist, and deputy medical director at University Hospitals of Leicester

Abstract

Introduction

The potential for digital workflows to improve the quality of care delivered to patients in the NHS has long been recognised. Despite electronic patient records(EPR) systems being deployed in the NHS, many Trusts are still reliant on paper-based care processes, causing both clinical frustration and safety risks.

Methods

In 2019, University Hospitals(UHL) of Leicester NHS Trust, one of the largest in England, signed a ground breaking 'co-development' EPR contract with a UK-based IT vendor. The aim is to co-develop a clinically focused, innovative EPR, built on a modern, mobile orientated code base, specifically tailored to the needs of NHS organisations.

Co-developing any new-to-market clinical IT system is inherently risky. We chose to tackle clinical complexity first in order to fully understand potential unforeseen risks. A system that demonstrated an ability to operate safely in the most complex clinical setting would allow fast and safe organisation-wide rollout.

To ensure patient safety, a robust clinical governance process was put in place, along with a clear standard operating protocol(SOP), streamlined error reporting and robust 'stop' lines agreed by all stakeholders.

Results

In September 2020, less than 12 months after signing the EPR contract, a brand new, previously undeployed Electronic Prescribing and Medicines Administration(EPMA) product was rolled out across 3 nephrology wards at UHL, including the renal high dependency unit. In October 2020, the pilot area was expanded to cover the renal transplant ward. The EMPA product included digital prescribing of Haemodialysis(Figure 1) and Peritoneal dialysis(Figure 2).

The SOP developed for the renal ward was used as the basis for roll out of the EMPA product across the rest of UHL. An adapted version of the SOP has since been shared with other NHS trusts, who have deployed the same EMPA product with no patient safety concerns.

The project team is currently on track to deploy a new-to-market, previously undeployed outpatient notation, order comms and digital prescribing solution, with a concurrent roll-out of a new Patient Administration System(PAS) by the end of 2024. Renal services is one of the pilot areas chosen to ensure the new system is equipped to manage clinical complexity.

Discussion

EPRs form the basis of a much needed digital revolution in the NHS. We have found deploying systems in the renal department to be one of the most effective ways to truly test system capability. Through deploying NHS specific co-developed products first in the renal department, all stakeholders gain confidence in the ability of the system to function in other clinical areas.

We hope as more EPR capabilities are deployed, tools such as a patient facing applications with results forwarding and direct peer-to-peer communication, will allow new care pathways to be developed. The complexity of renal medicine should not be seen as a challenge for digitalisation, but instead offer IT vendors a robust clinical challenge for their products, whilst allowing renal teams and their patients access to the best digital tools to enable safer and higher quality care.

Figure 1: Electronic haemodialysis prescription.

Figure 2: Electronic Peritoneal Dialysis prescription.

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Poster number: 313

Submission number:

What is a sustainability kidney scholar?

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Dr Rosa Montero

Biography
Dr Rosa M Montero is a Kidney and Transplant Consultant at St George's University Hospitals NHS Foundation Trust/gesh and Honorary Senior Lecturer at St George's University London. Dr Montero was appointed as a Scholar in Sustainable Kidney Care as part of CSH's and UKKA's group scholar programme. She is currently focused on driving sustainable changes in dialysis and kidney transplantation both locally and nationally. A member of the Sustainable Kidney Care SIG in the action and learning subgroup. She is the NHSBT workstream lead for work-up care pathways in transplantation. Dr Montero is part of the ABCD/UKKA guideline diabetes-kidney team and contributes to national BTS/UKKA guidelines. Other roles include the co-chair of the UKKA Living Well with Kidney Disease SIG, T-year academic lead at St George's University London and the QI and audit lead for the MBBS course. Her translational research focuses on biomarkers in diabetes kidney disease, transplantation and cardiovascular measurements.

Abstract

Introduction: The impact of climate change is being increasingly felt around the world with the NHS contributing to 4-5% of all carbon emissions in the UK. 40% of the public sectors emissions are due to NHS England, leading to Greener NHS England's pledge to reach net zero for emissions directly controlled by the NHS by 2040. Kidney care has a high environmental cost arising from procurement of complex machines, materials, pharmaceuticals together with high energy and water consumption. The carbon cost of a kidney patient is approximately 161kgCO2 equivalents per bed day compared with the average 80kgCO2 equivalent per bed day of secondary care patients.

Methods: I applied to the UKKA/CSH sustainability scholarship programme that is open to all renal staff. I furthered my skills in sustainability with the scholarship providing an understanding of the impact of kidney care on climate change, how to incorporate sustainability in quality improvement (SusQI) and learning carbon footprinting of healthcare. SusQI in particular ensures that high standards of patient care and population outcomes also incorporates the triple bottom line looking at social, financial and environmental outcomes providing sustainable value.

Results: This role allowed me to support the UKKW 2023 climate pop-up stand that allowed us to raise awareness following which 11 renal units came forward with Green Champions. I went on to join the Trust's Sustainability team as a Kidney Sustainability Lead and local departmental Kidney Green Champion. In our department I looked and assessed activities on the acute dialysis unit. With the dialysis education nurse and renal IT we introduced online priming to avoid waste of normal saline bags, provided teaching with the 'right bag, right bin', fistula on/off packs and mapped our dialysis patients to their nearest satellite dialysis unit to improve patient experience and reduce our carbon footprint. We are moving towards paperless documentation in dialysis and encouraging our dialysis providers to adopt the same method of working. I organised a Green week at the Trust and medical school that led to Green Champions across the Trust and the environmental sustainability group at the University. As QI Lead in the medical school I am looking to embed SusQI in the curriculum. I encouraged transplant colleagues in NHSBT to formalise a sustainability working group following the British Transplant Congress. We are now looking at pathways to reduce our carbon footprint in pre-operative workup, theatre, post-operative care and follow-up nationally. I have participated in the UKKA sustainability webinars that have helped increase awareness of the Green Kidney Sustainability Agenda. Working with estates and CSH we have developed a green renal build checklist providing guidance for new builds including dialysis buildings.

Conclusion: This programme has provided me with the opportunity to use a combination of top down and bottom-up approaches to increase awareness of the impact of dialysis and transplantation on climate change whilst also delivering and supporting local and national projects. As a community we can make a direct impact on reducing our carbon emissions. I urge everyone to take action before it is too late. If your unit does not have a Kidney Green Champion ask yourself why and decide to come forward and make a difference. No Planet, No Life.

Poster number: 314

Submission number: 430

Ten year partnership of UK Renal unit with Port Harcourt, Nigeria – lessons learnt

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Dr David Lewis

Biography
Consultant Nephrologist at Salford Royal Hospital, main clincal interests interventional nephrology, peritoneal dialysis and procedure training. Has participated in 3 teaching and training visits to Sub-Saharan Africa

Abstract

Our UK Renal Unit has a 10-year history of partnership with Port Harcourt Nigeria under the auspices of the International Society of Nephrology (ISN) Sister Renal Centre (SRC) Programme. The project has gone from local ISN educational ambassador to Level C, Level B and culminated in graduation from Level A. Here we summarise the journey and share lessons from the experience.

Methods

ISN SRC programme provided funding support for educational activities, capacity building including travel. Additional resources for research initiatives for early detection and management of acute kidney injury (AKI) and for the design of sustainable maintenance renal replacement therapy were sought from investigator-initiated research funding from industry and via ISN Clinical Research Grant Scheme respectively. Resource for hands on training were sought via industry partners.

Results

Level C: collaboration at this stage was long distance teaching and training. The hospital wide MDT was involved in online seminars in general and specialist areas of nephrology.   Funding via the ISN for improved Wi-fi and internet subscription and battery backup was crucial due to frequent power failures and served for monthly zoom calls during the COVID-19 pandemic.

Levels B & A:

Visits:

2018: Visit to the UK by Nigerian nephrologist observing clinical practice, establishing links to UK Renal Registry, and receiving mentoring in practical procedures.

2019 & 2023. 3 UK nephrologists undertook weeklong visits to Port Harcourt. These included work on AKI, teaching for the MDT and hospital grand rounds, undertaking practical procedures with local clinicians and planning peritoneal dialysis pathways. POC ultrasound device that was provided by Ballater Medical Ltd, UK, made possible teaching on procedures as local ultrasound device was not functional at the time of visit.

Research projects:

1. AKI project: A three staged research programme for early detection and management of acute kidney injury using point of care (POC) creatinine in Nigeria was launched in 2019 following a multidisciplinary workshop. The programme completed the first 2 stages (1) and is now recruiting in the third stage. Point of care devices were loaned by the UK centre and consumables were provided for free via investigator-initiated grant from Nova biomedical.

1. "Goal directed peritoneal dialysis in Nigeria" research project was awarded the ISN Clinical Research Programme Grant. Recruitment was challenging due to lack of awareness and patients' mistrust to peritoneal dialysis. The project was temporarily suspended after the emigration of a key member of the Nigerian team.

Challenges

Japa is a term used to describe "self-exportation of Nigerians abroad" and poses a major risk for renal initiatives that rely on a very limited number of specialists in Africa. Regional networks, driven by ISN, can aggregate renal resources and ensure sustainability and effectiveness of research educational initiatives.

Transfer of medical equipment and consumables is challenging and requires established links with local authorities.

Travel required careful planning, and appropriate security arrangements as the region has significant security challenges.

Conclusion

It has been a privilege to contribute to improving healthcare in Nigeria. There is a steep learning curve and difficulties to overcome in all aspects of these projects. Nevertheless, we would encourage and support any centre forming links abroad.

Acknowledgements

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Poster number: 315

Submission number: 456

Implementation and Impact of the Making Every Contact Count (MECC) Approach in Renal Services: A Training Initiative in a dialysis unit

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Mrs Tadala Kolawole

Biography
Tadala is a senior renal dietitian providing nutrition education and counseling for patients with chronic kidney disease. Working in one of London's most ethnically diverse boroughs, she is passionate about increasing diversity in dietetics and educating her colleagues on culturally appropriate foods to provide better outcomes for her patients. Driven by a commitment to address health inequalities and the wider determinants of health, She works with organisations and local schools to promote the profession and encourage healthcare as a career path for the residents of North east London. Tadala has been acknowledged for her contributions to Equality, Diversity, and Inclusion (EDI) and garnered multiple awards in recognition of her work in this area. Tadala has presented at conferences and has lent her expertise to higher education institutions in the UK and internationally, delivering lectures on EDI and renal dietetics. With over a decade of experience in working with patients living with long term conditions, she values the healthy conversation skills she has acquired and is looking forward to sharing them with her renal colleagues via the MECC training program.

Abstract

Introduction:

Research has shown that telling people what to do is not the most effective way to help them to change (1). Making Every Contact Count (MECC) is a behaviour change approach aimed at delivering consistent and concise healthy lifestyle information opportunistically and enables individuals to engage in conversations about their health. Patients are empowered to seek out their own solutions to support their health (2).

Barts Health is one of the largest renal services in the UK, with over 1200 haemodialysis patients. The renal team recognised that staff across the service have multiple contacts with individuals and are ideally placed to support health and wellbeing. Training staff to make every contact count means providing staff with the leadership, training and information they need to deliver the MECC approach at all stages of the patients CKD journey.

Methods:

In August 2023 funding was provided for three members of the renal multi-professional team to attend a train the trainer programme. MECC training comprises group education session split over 2 half days, facilitated by two trainers.

In 2023 392 patients commenced in-centre haemodialysis at Barts Health, of whom 30% were not previously known to renal services, therefore a decision was made to train all staff in the New Starters Dialysis Unit in MECC.

To date 12 people (50% of New Starters staff) have been trained over the course of a total of four half day sessions, with more dates planned for 2024. Pre and post session evaluation forms were completed, with plans for a further survey sent to participants 6 months later. A survey was sent out to the first cohort of participants to check whether staff were still using the skills and whether they remembered the skills and principles of a healthy conversation.

Results:

Immediately post training staff were asked how valuable they felt the training had been on a scale from 1 to 10, with a median rating of 8. Feedback forms reflected increased confidence in applying learned skills to support their patients in making lifestyle changes. A key change in the post evaluation forms was a reduction in "telling" patients what to do and the use of open discovery questions.

At 6 months post training, 100% of the staff reported still using the skills with their patients and 50% were able to recall all 5 key skills.

Discussion:

The lack of pre-dialysis care in patients presenting late to renal services is known to be associated with adverse outcomes (3). Improving outcomes in this cohort requires a need to address patient factors in a non-confrontational or judgmental way. Training staff to use MECC and the multi-professional approach to improve behaviour change through routine care provides better support for those who are unable or unlikely to engage in formal intervention programmes. Embedding MECC training and supporting staff to use their skills across all new starters, and other services such as pre-dialysis and post-transplant follow up empowers both staff and patients to work towards a more holistic delivery of care.

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The value of bite-sized training on autism spectrum conditions in a Renal Unit

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Caroline Anderson

Biography
Dr Caroline Anderson is Principal Clinical Psychologist providing care for renal patients based in the Wrexham Maelor Hospital in North East Wales. Caroline's work within Health Clinical Psychology is influenced by her background in research and physical health care settings. Completing her first research based doctorate in neuroscience, Caroline then moved to qualify and provide clinical psychology support in services for those with long-term conditions including neurological impairments and autism spectrum conditions. This informed her move to renal care and focus on service development. Recently Caroline has also worked with Popham Kidney Support to help establish peer support services in North Wales.

Abstract

Autism spectrum conditions (ASC) are neurodevelopmental and primarily characterized by challenges in social interaction and communication, along with restricted and repetitive behaviours. Those exhibiting traits associated with autism, with or without learning difficulties (LD), often experience unmet healthcare needs due to individual, service-level and systemic factors[1].

There is growing evidence that ASD and chronic kidney disease (CKD) have some overlaps with genetic mutations and environmental factors contributing to a shared role in their development[2]. Though the prevalence of ASC in those with CKD is not yet known, there is evidence that 25% of adults with ASC and LD are also found to have CKD[3].

Autism-specific care plans are optimal to optimise care for those with ASC[4]. However, knowledge and understanding of ASC may be limited[5] especially within physical healthcare multidisciplinary teams (MDTs). Following an observed increase in referrals to Renal Clinical Psychology in relation to issues potentially relating to ASCs a training need was identified. Issues were also identified in making training accessible to a busy MDT staff group.

The study aims to assess the benefits of bite-size teaching sessions, each lasting approximately 30 minutes, designed to address these challenges by offering concise and accessible training to Renal Service MDT staff.

This brief pilot study will use a pre-and-post assessment design to measure the value of a brief, bite-size, training session(s) on ASC within a renal service, staff understanding of ASC and confidence levels when meeting the needs of patients with CKD. The surveys will use quantitative and qualitative measures

focusing on MDT staff perceptions of their understanding of ASC and confidence working with individuals with autism spectrum conditions. There will also be opportunity to reflect on barriers for MDT staff to accessing training.

The results of this study will help inform both future training on ASC for renal MDT staff and optimal methods of training delivery for a time-pressured service.

Note: The diagnostic terminology is Autism Spectrum Disorder (ASD) however, the term Autism Spectrum Condition (ASC) is used here as it communicates a neutral rather than negative and stigmatising perception associated with the term 'disorder'.

This abstract is submitted with preference for a poster, not oral, presentation

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Poster number: 317

Submission number: 87

Reducing the carbon footprint of renal biopsy procedure: Navigating toward net zero NHS

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Dr Saeed Ahmed

Biography
Consultant Interventional Nephrologist and Clinical Director South Tyneside and Sunderland NHS Foundation Trust

Abstract

Introduction

The carbon footprint encompasses the cumulative greenhouse gas (GHG) emissions attributed to a specific process. The GHGs commonly includes six different types of gases, each characterized by its unique global warming potential. These quantities are commonly expressed as "carbon dioxide equivalents" (CO_2e).

While renal biopsy has retained its pivotal role as a medical procedure for decades, aiding in precise diagnosis, prognosis, and treatment planning, it also brings forth a range of associated costs, encompassing patient transportation, hospital expenses including medical and surgical apparatus employment, and the management of resultant organic waste. Regrettably, these activities contribute to the emission of greenhouse gases into the atmosphere. We as healthcare professionals recognize the environmental damage associated with the delivery of kidney care and our responsibility to future patients to leave resilient and sustainable services on a live-able planet. This study aims to ascertain the carbon footprint associated with renal biopsy procedures and endeavors to curtail said footprint, thereby advancing towards the overarching objective of achieving net-zero carbon emissions within the National Health Service (NHS).

Methods

The methodology employed herein entailed the assessment of carbon emissions stemming from diverse resources and actions related to renal biopsy procedures. Notably, this encompassed the evaluation of GHG emissions generated by the deployment of assorted medical and surgical instruments, electric energy consumption during procedural execution, and the energy outlay connected with the waste incineration of products employed in said biopsy procedure. The carbon emission was quantified utilizing their respective GHG emission factors. These emission factors were sourced from the Greener NHS 20/21 database.

It is noteworthy that certain elements, such as patient and staff travel, were omitted from the scope of this study

A concerted effort was exerted to curtail the carbon footprint of the procedure. This was achieved through judiciously minimizing the quantity of instruments deployed for the biopsy, leading to a tangible reduction in per-biopsy cost by £5.14 and a decrease in instrumentation weight by 319 grams.

Results

As a result of the changes implemented, the total carbon footprint of one single renal biopsy decreased from 30.87kgCO2e to 27.433kgCO2e. Hence for every single biopsy the carbon footprint was reduced by 3.43kgCO2e. An average of 150 renal biopsies are performed in SDIN. So over a period of one year the emission of GHGs was successfully reduced by 514.5 KgCO2e.

Discussion

This initiative aligns with the overarching objective of achieving a carbon-neutral NHS. As deliberated during the UK Kidney Week 2023, we earnestly encourage healthcare professionals to accord heightened attention to this facet, fostering a collective endeavor towards realizing the aspiration of net zero NHS carbon emissions and fostering an environmentally sound healthcare milieu.

References

Greener NHS 20/21 database

Perspectives of clinical research nurses on delivering clinical research trials in nephrology

<u>Ms Kulli Kuningas</u>[1], Dr Brand Sarah[2]

[1]University Hospitals Birmingham, Birmingham. [2]Nottingham University Hospitals NHS Trust, Nottingham

Ms Kulli Kuningas

Biography
Kulli has been Lead Renal Research Nurse at University Hospitals Birmingham for several years. She is also active in the Research Community of Practice of the Association of Nephrology Nurses UK (ANNUK)

Abstract

Introduction

Research is crucial to the quality of care offered to patients and clinical research trials are fundamental to this. In the UK these clinical trials are delivered in a variety of ways within Renal Units, but clinical research nurses are pivotal in their successful delivery.   Understanding the training, development and support needs of these nurses, as well as the challenges which they face is crucial in enabling them to function effectively and therefore support robust clinical research delivery in the renal field.

Methods

An online survey was circulated within the renal clinical research nursing community. This utilised networks developed by the Association of Nephrology Nurses (ANNUK) and was also publicised by clinical trials units which were hosting national clinical trials within the UK. The survey collected demographic data, as well as that on training and support opportunities for clinical research nursing staff, challenges faced by these teams and finally, perspectives on what development and support would be beneficial to this group of staff.

Results

31 responses were received.

- Half of respondents (15/31) worked in multi-disciplinary clinical research teams rather than specialist renal clinical research teams
- Less than half of respondents (13/31) had access to specialist renal education or training
- Half of respondents (16/31) felt that nurses in clinical areas supported and encouraged research activity in the clinical area
- Main challenge faced was lack of staff, but others were time constraints, working across multiple specialities, inadequate resourcing and lack of speciality training.

- Respondents were interested in having education in a range of renal topics as well as research specific areas. Financial aspects and audit/monitoring/inspections were the most highly requested research training area.
- An identified challenge was poorly defined career pathways for clinical research nurses and a need was highlighted for support with development in research leadership, clinical academic career opportunities and role development as a Principle Investigator.

Discussion

As well as good study design and a potential patient pool, successful clinical research delivery largely relies on the individuals who are carrying out study procedures. Having knowledgeable and well supported research nurses and practitioners is fundamental to this. Understanding their perspectives both in terms of support and development needs as well as the challenges they face is important to then design and implement interventions and support which will improve their ability to deliver clinical research effectively and efficiently.   Understanding renal speciality specific issues provides a nuanced understanding of clinical research delivery and ensures that where necessary, bespoke focused support can be provided to meet the needs of renal patients, staff and processes. This will lead to research-positive cultures within organisations delivering renal care, ultimately widening access to clinical research for kidney patients.

Findings from this study will be used by ANNUK to develop a strategy to support networking and establish educational and development opportunities for clinical research nurses delivering studies focused on improving the quality and outcomes of kidney care.

Factors determining late cancellation of elective day case procedures among patients admitted to the renal day unit - single centre study

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Renal Unit, St. Helier Hospital, Surrey UK

Dr Christy Rajeevkumar Ratnakumar

Biography
I currently work as specialty registrar in Nephrology at St Helier hospital. I have graduated MBBS in Sri Lanka at University of Sri Jayewardenepura (2008-2014) with First class Honors. My postgraduate qualifications are MD Medicine from postgraduate Institute of Medicine, University of Colombo, Sri Lanka and MRCP UK. I am a trainee in Nephrology in Sri Lanka, who has successfully completed the postgraduate MD program in Medicine and currently undergoing my overseas post MD specialty training in Nephrology. My vision is to improve the quality of care provided to patients with kidney diseases and to contribute to the development of the field of Nephrology internationally. I had broad exposure to inward care, intermediate care and outpatient care of patients with kidney diseases. I have had good experience in renal transplantation and interventional nephrology as well. I have wide range of interests in nephrology, especially glomerular diseases, renal transplant medicine and intervention nephrology. During my training in UK I have developed special interest in research, quality improvement projects and teaching. I look forward to gain more experience in United Kingdom

Abstract

Introduction

Late cancellation of elective procedures in renal patients is a major challenge faced by UK health system. Renal patients have a higher than average cancellation rate on the day of procedure due to various reasons. Cancellation of procedures exacerbates health cost and negatively affect patient outcome.

Method

Data was collected retrospectively using Renal day unit (RDU) daily performance record, between July 2021 and March 2023 in a tertiary care center. RDU is mainly designed for outpatient elective day procedures such as kidney biopsy, haemo dialysis and peritoneal dialysis catheter insertion. Patients whose procedure cancelled after admission to the RDU were identified and their basic characteristics such as age, sex , distance , urgency of procedure and factors that could have contributed to the cancellation were reviewed. Data was analyzed using Microsoft excel.

Analysis

Over this period the total number of procedures performed on the RDU were 1326 and 75 were cancelled (5.6%). Among those, patients` aged above 60 years were 39(52%), whereas age below 30 were 4(5.3%). 16(22%) were found to be urgent cases. Out of all type of procedures Kidney biopsy was found to be the commonest one (n=54,72%) to be cancelled with native biopsy 42(78%) and transplant biopsy 12(22%)(figure 1). Cancellation of kidney biopsies were predominantly due to elevated blood pressure (>150/90 mm Hg) in 21(38%), non biopsiable kidneys on bedside imaging 7(13%) and improvement in kidney function on the day of procedure (eGFR/proteiuria) 9 (16 %) (figure2). Among the patients cancelled due to elevated blood pressure only 2(3.7%) were urgent cases.

Conclusion

Cancellation rate of elective day case procedures was relatively low in our center. Out of all the cancellations majority were kidney biopsies and major causes identified are elevated blood pressure , non-biopsiable kidneys on imaging and improvement in kidney function on the day of procedure. Optimization of Blood pressure , imaging of the kidneys and reviewing the kidney function prior to the procedure day may help to reduce the late cancellations and can improve cost effectiveness and patient outcomes.

Figure 1

Procedures that were cancelled
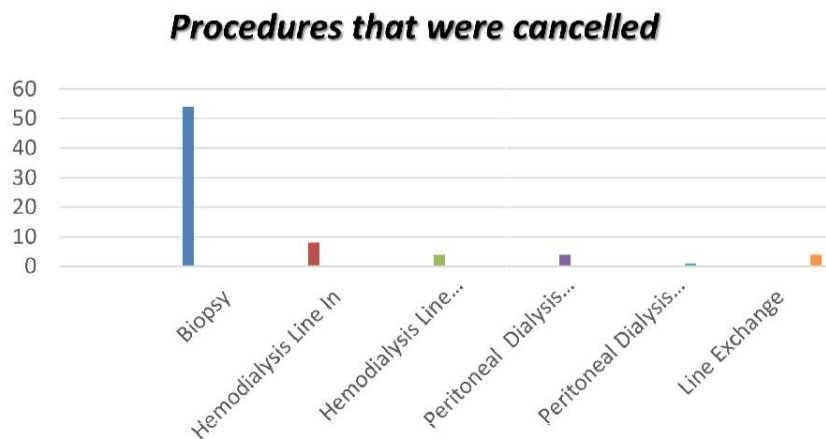
Figure 2

Reasons for cancellation of biopsy
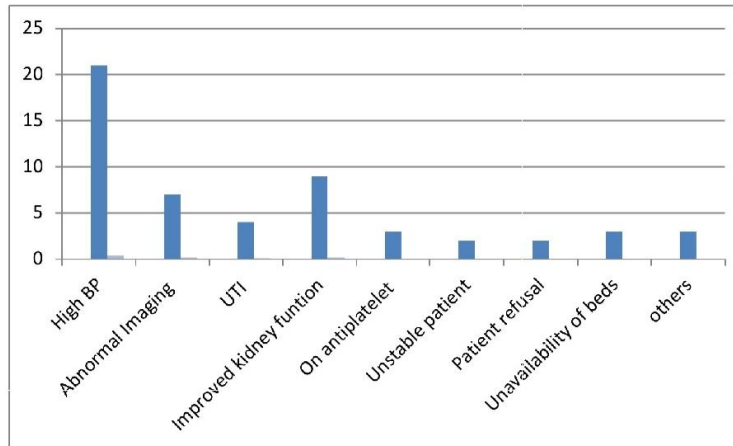
Poster number: 320

Submission number: 427

Examining results from the needling patient reported experience measure (NPREM)

Ms Amanda Busby[1], Miss Rebecca Flanagan[1], Fez Awan[2], Dr Helen Ellis-Caird[1], Catherine Fielding[3], Dr Kieran McCafferty[4], Dr Sabine van der Veer[5], , Prof Ken Farrington[1], Dr David Wellsted[1], Dr Currie Moore[6]

[1]University of Hertfordshire, Hatfield. [2]Independent, n/a. [3]University Hospitals of Derby and Burton NHS Trust, Derby. [4]Barts Health NHS Trust, London. [5]University of Manchester, Manchester. [6]University of Salford, Salford

Ms Amanda Busby

Biography
Amanda is a Research Fellow and Medical Statistician who has been working at UH since 2017. She specialises in providing statistical support for clinical and other studies, having obtained her MSc in Medical Statistics from the London School of Hygiene and Tropical Medicine (University of London) in 2019. Since joining the university, Amanda has analysed the ongoing annual Kidney Patient Reported Experience Measure (Kidney PREM) as well as working with data from two UK based Rheumatology cohorts. She also contributes to statistics on projects supported by the Clinical Trials Support Network (CTSN), providing unique and valued expertise within the team.

Abstract

Introduction

People on haemodialysis rely on having reliable access to their vascular system, often via surgically created arteriovenous fistula or graft. At the beginning of each dialysis session, needles must be inserted. While 'needling' is a key step, an annual UK survey shows that needling is one of the lowest scoring areas of reported experience for individuals receiving haemodialysis in a kidney centre or satellite unit. Qualitative research indicates that needling can be painful and cause anxiety. Despite these findings, no reliable way to assess patients' experience of needling existed. Therefore, we developed and validated the Needling Patient Reported Experience Measure (NPREM). It consists of 28 items across five themes of care (Communicating with the Team, My Fistula/Graft and Needling, Steps in Needling, Working Together, My Personal Experience) and Overall Needling Experience. Here we report the results of an in-depth examination of the NPREM.

Methods

Between February-April 2023, eight NHS kidney centres recruited participants (aiming for 500 participants). Participants completed either online or paper versions of the NPREM, alongside additional sociodemographic/clinical questions. Responses were captured on 7-point Likert scales (7= positive needling experience, 1= negative needling experience).

Summary NPREM scores (27 questions excluding Overall) were estimated if participants had provided a response to >80% of the questions within the measure. Similarly, theme scores were estimated if the minimum number of responses was met. Descriptive statistics (means, standard deviations [SDs], medians, interquartile ranges) were estimated to describe differences between participant characteristics and between centres.

Results

N=468 participants [67% male, mean age 66 years (SD 14), 76% white, 95% access via fistula, 76% first access] completed the NPREM. Of these, 427 (91%) answered sufficient questions to be included in analysis. Participants reported 'Communicating with the Team' to be the most positive theme of care, with 'My Fistula/Graft and Needling' and 'My Personal Experience' the scoring the lowest (Table 1). Items with the lowest scores related to painfulness of needling, who will needle, longevity of the fistula/graft, and being nervous beforehand (>30% selected 1-4 as response). Participant characteristics (e.g., age, ethnicity) were not associated with any statistically significant differences in needling experience. However, significant differences existed between centres in Overall Experience (mean 5.91 [SD 0.31], Figure 1) and across every NPREM theme (means 5.11-6.00 [SDs 0.32-0.46], ranges 0.82-1.38), other than for the highest scoring theme, 'Communicating with the Team' (mean 6.20 [SD 0.23]), in which the range of centre scores was lowest (0.60).

Discussion

These results suggest that NPREM captures variation in patients' experience of needling across themes. This demonstrates that NPREM can assist clinicians in pinpointing any area(s) of care negatively impacting patients' experience of needling in their service, allowing implementation of meaningful improvements. The variation across centres provides an opportunity for centres to learn from each other regarding specific aspects of needling. The NPREM offers the first reliable and validated way to quantify needling experience and thus begin to better understand it.

Table 1. NPREM scores by theme, overall experience, and summary score

	N	Mean (SD)	Median (IQR)
Communicating with the Team	411	6.23 (1.02)	6.6 (5.8, 7.0)
My Fistula/Graft and Needling	410	5.15 (1.51)	5.3 (4.3, 6.3)
My Personal Experience	421	5.21 (1.34)	5.5 (4.3, 6.3)
Steps in Needling	409	5.64 (1.10)	5.8 (5.0, 6.5)
Working Together	413	6.03 (1.10)	6.4 (5.5, 7.0)
Overall Needling Experience	413	5.96 (1.28)	6.0 (5.0, 7.0)
NPREM Score	427	5.69 (1.02)	5.9 (5.1, 6.5)

Figure 1: NPREM Overall Needling Experience Scores and 95% Confidence Intervals by centre
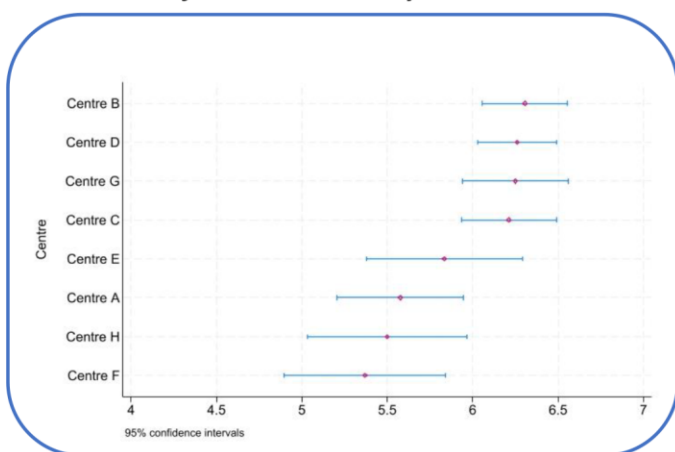
Poster number: 321

Submission number: 447

London Transplant Collaborative Patient Co-Designed Pathway for Mutual Aid

Ms Lisa Silas[1,2], Mr Ismail Mohamed[1,3], Dr Sapna Shah[1,4]

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Ms Lisa Silas

Biography
Lisa Silas has worked extensively within in a nephrology and transplantation setting for over 30 years. She has experience of working with dialysis and pre dialysis patients and more recently in the field of transplantation. She was appointed as an Advanced Nurse Practitioner for Living Donation and recipient work up at Guy's & St. Thomas' NHS Foundation Trust in 2010. Apart from leading the pre transplant nursing team for one of the largest living donor transplant programmes in the UK, she contributes to the national agenda for living donation by participating in the Living Donor forum, reviewing and contributing to national best practice guidelines. She is currently co-chair of the London Kidney Network Transplant Collaborate workstream

Abstract

Introduction

The London Transplant Collaborative's mutual aid programme was implemented in 2020 to address an acute lack of capacity for deceased donor kidney transplantation as a result of the COVID-19 pandemic. When a deceased donor transplant cannot be facilitated in one of the London transplant centres for logistical reasons, the patient can be transferred to another centre to receive their transplant within the framework of the mutual aid programme.

This initiative was initially designed by clinicians to fulfil an acute clinical need without patient involvement. The programme was reviewed in 2023 and patients transplanted with the assistance of mutual aid, provided feedback. Following this, formal invitation for patient participation to consider patient perspectives, preferences, and needs was made. We planned to seek patient views from different stages in their renal journey to recognize the potential for varied experiences, concerns, and insights based on their distinct positions in the transplant process.

Methods

Two virtual patient focus groups were held on Microsoft Teams, one including patients who had never received a kidney transplant and one including those who had already received a transplant.   The patients invited were active volunteers from the London Kidney Network (LKN) Patient Partnership

Engagement (PPE) group with lived experience. The groups were facilitated by the LKN PPE lead and attended by three co-chairs of the LKN Transplant Collaborative workstream.

The pre-transplant group included 4 patients, one on peritoneal dialysis, 3 pre-dialysis patients, one of whom was a patient representative from the LKN young adult group. Two of the London Hospitals were represented.

The post-transplant group included 8 patients who had received a transplant and there was representation from all 5 London transplanting centres.

Both focus groups used the same structured format, including a presentation from a surgeon, open discussions about the participants' reactions to mutual aid. Both groups were asked what information they would like to receive about the mutual aid programme, what information would be helpful, when they would like to receive the information how they would like it to be delivered.

Results

None of the patients in either group were aware that the mutual aid programme existed, but saw it as a positive initiative. Both groups wanted reassurance that information shared between units was securely shared and comprehensive enough to ensure their safety in an unfamiliar environment.

The pre-transplant group originally thought they would like detailed information about the programme and the hospitals they may potentially attend. On reflection, they realised that the possibility of them requiring mutual aid was low, so they ultimately came to a similar conclusion to the post-transplant group-see table below.

The table below shows an amalgamation of the discussion outcomes from both groups.

Assessment

- Inform patient about existence of mutual aid programme (minimal)
- Signposting for further information
- Leaflet
- Brief information about London units

Before Transfer

- If required, more detailed conversation about mutual aid
- Contact information for family and carers

At Transplanting Centre

- Contact information for family and carers
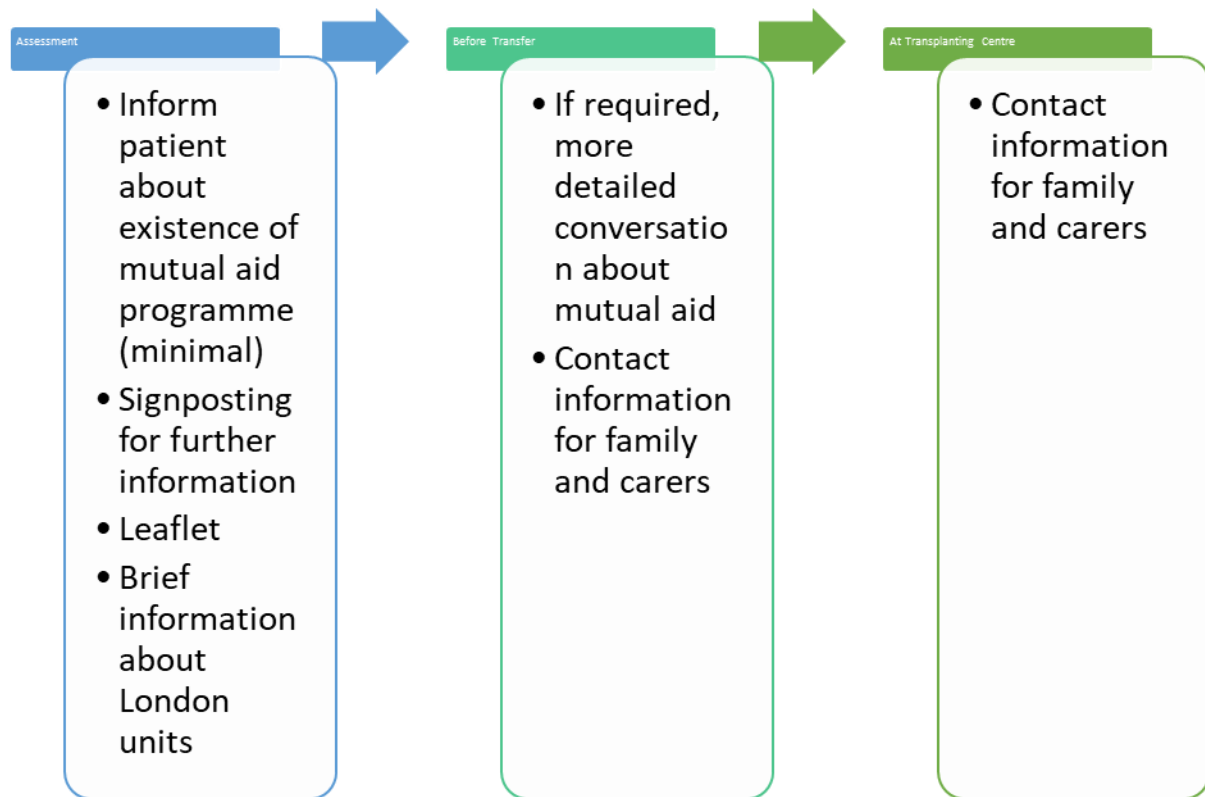
Discussion

We believe that as a result of our focus groups and listening to our patients, we can improve the service we offer to patients. Greater engagement and better shared decision-making leads to better outcomes, both in terms of patient experience and clinical outcomes.   By actively engaging with our patients in this way, we hope to build on the culture of shared learning within the LKN.   If patients as stakeholders demonstrate their investment and make their voices heard, it presents us with the opportunity to get greater buy-in from other stakeholders.

Poster number: 322

Submission number: 451

"I don't think there's a one-glove-fits-all." Barriers and facilitators to providing person-centred renal care

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Dr Lucy Selman

Biography
Dr Lucy Selman is Associate Professor in Palliative and End of Life Care at the University of Bristol, where she co-leads the research group. As part of an NIHR Career Development Fellowship (2019-2024) she is leading the OSCAR study (Optimising Staff-Patient Communication in Advanced Renal disease). Specific current research interests include treatment decision-making and communication; family care-giving and bereavement; widening access to services; and public health approaches to end-of-life care and bereavement. She has published over 100 peer-reviewed papers and regularly contributes to discussions about end-of-life care and bereavement in the media. In 2020 she founded Good Grief Festival, a public engagement initiative which has now reached over 30,000 people.

Abstract

Introduction

For many older patients with kidney failure, dialysis provides modest or uncertain survival benefits, and transplant is usually not medically possible. Conservative kidney management (CKM) can be a beneficial alternative. However, there is significant variation in treatment rates among older patients with kidney failure in England and Wales, ranging from 5% of older people receiving dialysis at some renal units to 95% at others (Roderick et al. 2014). This variation suggests decision-making is inconsistently patient-centred. We aimed to understand and explore barriers to and facilitators of person-centred care at four renal units.

Methods

A qualitative study was conducted in two phases: (A) Ethnographic, non-participant observation of clinical consultations and outpatient waiting areas, to understand the context of each renal unit. (B) Semi-structured interviews with renal clinicians, exploring potential barriers and facilitators to person-centred care.

The observation schedule and topic guide were developed using Normalisation Process Theory (May et al. 2009) (which addresses the factors needed for successful implementation and integration of

interventions into routine work) and the Theoretical Domains Framework (Cane et al. 2012) (a theoretical lens to view cognitive, affective, social and environmental influences on behaviour).

Observations and interviews were conducted iteratively, with observations contributing to interview topics and clinicians suggesting areas to observe to include aspects that were most challenging to them in relation to supporting patients' decision-making. Interviews were conducted in-person or online and transcribed verbatim.

Analysis: Observation fieldnotes and interview transcripts were analysed thematically using inductive and deductive coding and a team approach.

Setting: Four UK renal units with differing dialysis rates for older people. Units were located in different urban and peri-urban locations and served diverse ethnic communities.

Results

(A) Fieldnotes were collected through 68 hours of observation of outpatient appointments, remote appointments and group patient education sessions, and in outpatient waiting areas. (B) 22 interviews were conducted with renal consultants (n=12), registrars (n=2), junior doctors (n=1), specialist nurses (n=6), and a renal psychologist (n=1).

Table 1: overview of themes of barriers and facilitators to patient-centred care

Barriers:	Time	*I mean, I... I do... I've sort of been questioning recently, with all the advanced care planning as well, whether, you know, the...the NHS sort of outpatient model is fit for purpose, in terms of, you know, the kinds of decisions we're make... asking people to make are very difficult...* **1-C-20, consultant**
	Service pressure	*But organ-specific care is the way the NHS is going, it's dreadful, it's dreadful. No one's interested in the whole person.* **1-C-03, consultant** *There's constantly a... it feels like there's constantly a push from the powers that be to... you know? At the moment, it's home therapies. We should be putting everyone on PD, or home haemo... Because that's... you know? There's either funding decisions, or that's the best thing for patients, that we're told. Or, you know, there's a push for people to... just to... to... to dialyse through a fistula rather than line. And that's just because, you know, there's targets associated with that rather than that... necessarily thinking about what the... the best thing for the... for the patient is.* **3-C-09, consultant**
	Availability	*Unfortunately, due to lack of resources in the last few years, we haven't been able to offer assisted peritoneal dialysis to the level that we really want.* **4-C-08, consultant**
	Perception that discussing CKM emotionally challenging	*Talking about supportive care [takes]... 10 times more courage... In general giving dialysis is a much easier option... more relaxed with the patient doctor relationship. There's no strain, everyone is happy and you have given them something.* **1-R-07, Registrar**
Facilitators:	Role perception	*from my perspective, I view it as saying, "Okay, I have this chunk of information, I know this thing about you, I think this will happen to you in the future, I think these are your options. How do I get you to understand that? How can I teach you this stuff about dialysis? How can I teach you how dialysis works and what it's doing in a way that will be useful to you when you make your decisions?" And I think that's probably the role, and I realise that's probably more of the touchy-feely end of things, and some of my colleagues would be much more, "My job is to say what I think you should do and persuade you to do it." I think I'm more that patients should be given, should be given the information as a passive thing, they should be taught what dialysis is, which is very different to just saying, "Here's a book, this is what dialysis is, this is the knowledge you need." It's more about learning what it's doing for you, how it's going to make you feel, how you might fit it into your life, how something else might fit in," and getting people to a point where they can make an educated decision and say, "I think this is the best thing for me on balance."* **1-C-08, consultant**
	Supportive approaches	*You can have a discussion that you think is being open, and then you look back on things and think actually, the way I presented that very much weights things one way or the other. So, the ideal thing is allowing a patient to make a shared decision with us, but an informed decision that puts their values and their priorities at the forefront in terms of the decision that they are making, but to be able to do that, we need to be able to communicate the options in as neutral a form as possible with their priorities as a focus.* **3-R-16, registrar**
	Presenting information in unbiased way	*Give information, yeah, try not to bias, and try and support them and support the patient's decisions with their family.* **1-N-11, nurse**

Clinicians spoke of a divide between "new" and "old school medicine," the latter characterised as less person-centred. We noted disparities across all sites between the stated values of clinicians (generally emphasising patients' priorities) and the time allotted to the discussion of priorities in consultations. Systemic barriers to person-centred care were identified, including time-pressured consultations, prioritisation of dialysis, and an emphasis on decision-making over exploration of options. Some clinicians were reluctant to raise CKM for fear of upsetting patients. Facilitators of person-centred care

included dedicated time to explore patients' priorities, and clinicians perceiving themselves as educators and guides as opposed to decision makers or information givers.

Discussion

Barriers to person-centred care include service-level preferences for dialysis; a lack of time for discussing patients' priorities; and clinician discomfort in discussing CKM. Shifting the clinician's role towards educator and guide (rather than prescriptive decision-maker) may enable clinicians to better facilitate patient-centred decisions.

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Poster number: 323

Submission number: 457

The Hospital Frailty Risk Score lacks service planning and decision-making utility in End Stage Kidney Disease

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Dr Andrew Mooney

Biography
Dr Andrew Mooney is a Consultant Renal Physician at Leeds Teaching Hospitals NHS Trust. His previous work with Connected Bradford has shown that frailty scores are a powerful predictor of survival for patients undergoing dialysis treatment for Chronic Kidney Disease (CKD).

Abstract

Introduction

Survival time for patients commencing dialysis is poor (median 2.0 years in our data) and treatment is invasive. While the age of patients commencing dialysis has increased significantly, the survival advantage diminishes with increasing comorbidity and frailty. The Hospital Frailty Risk Score (HFRS) is a recently-described score derived from ICD-10 codes which has been shown to correlate with outcomes in patients aged >75 years admitted to acute hospital settings. As part of a wider initiative to improve service planning and patient decision-making in the renal setting, we investigated the utility of the HFRS in modelling the survival time of dialysis patients with chronic kidney disease (CKD) both prior to reaching end-stage kidney disease (ESKD), and at dialysis start date.

Methods

A secondary care dataset was obtained of all patients who attended pre-dialysis clinic at a single renal unit in the north of England between 2006–2019 (n=2,573). Patients choosing dialysis and conservative management were included in the cohort; 1,081 eventually underwent dialysis including 329 patients who were aged ≥70 years when they commenced dialysis. 62.9% were male. Retrospective survival analysis was conducted using the HFRS prior to, and at, dialysis start date and estimates compared using the log-rank test.

Results

HFRS on dialysis start date was associated with survival time in patients aged ≥70 years (Low frailty Median=2.5 years; CI=[2.1 – 3.0 years] vs. Intermediate frailty Median=1.5 years; CI=[1.0 – 2.0 years] vs. High frailty Median=1.3 years; CI=[0.2 – 2.2 years]; p=0.005). No association was found between HFRS and survival in the same patients (aged ≥70 on dialysis start date), at any of 3 timepoints prior to

dialysis: eGFR level of 20, 15, or 12 (p=0.18, p=0.63, p=0.38 respectively). However, only 150/329 patients (46%) had HFRS recorded prior to eGFR level so sample size was limited. 60 patients' HFRS had also worsened by dialysis start date (8 had improved). Additional analyses including all age groups found a weaker association between HFRS on dialysis start date and survival (Low frailty Median=2.1 years; CI=[1.9 – 2.3 years] vs. Intermediate frailty Median=1.7 years; CI=[1.5 – 2.0 years] vs. High frailty Median=2.1 years; CI=[1.3 – 2.4 years]; p=0.04). HFRS and survival were associated at eGFR 15 for all ages (p=0.02) but not eGFR 20 or 12.

Discussion

We identified issues with the HFRS and its implementation that present challenges to its utility for treatment decision-making or service planning in a renal setting. While the HFRS has previously been shown to be predictive of 30-day outcomes in an acute admissions unit, it performed poorly in our cohort of patients with CKD, a long-term condition where HFRS may worsen or improve between treatment choice and dialysis start. Although HFRS did predict outcome from dialysis start in patients aged ≥70 years, this is of limited use given the abundance of validated tools that predict outcome at ESKD. More work is needed to refine the HFRS for pre-ESKD decision-making in a renal setting.

Key words: hospital frailty risk score, HFRS, renal, dialysis, survival

A single centre retrospective study of biopsy complications following a change in the post-biopsy observation protocol.

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Royal London Hospital, London, UK

Miss Aleksandra Lopuszko

Biography
I am a final year medical student at Barts and The London School of Medicine, Queen Mary University of London. My areas of interest are transplantation surgery and laparoscopically-assisted kidney surgery. My research background is the MSc in Laparoscopic Surgery and Surgical Skills.

Abstract

Introduction:

Kidney biopsy is used for the histopathological diagnosis of kidney disease in both acute kidney injury and chronic kidney disease. It carries a small but significant risk of bleeding. Post-procedure protocols for kidney biopsy vary among institutions. This may include stratification into high and low-risk categories, differing periods of bed rest for observation, and need for inpatient stay. Several studies have looked into renal biopsy protocols and correlation with complication rates. Barts Health does approximately 500 biopsies per year, and after review of the literature changed its post-biopsy monitoring protocol to reduce bed rest time from 6 hours post-biopsy to 4 hours in 2019. The aim of this study was to compare complication rates before and after the protocol change and assess the safety of the new protocol.

Methods:

All percutaneous non-directed kidney biopsies before and after between January 2017 and August 2021 were identified from histopathology records, and complication rates were compared between 1000 biopsies under the old protocol and 1000 after the protocol change. A total complication rate of 10% is quoted to patients during the consent process, with a major complication rate of 1-2%. Data collection included patient demographics, biopsy findings, pre-procedure investigations, blood pressure, and technical aspects of the procedure including operator and number of passes and cores obtained. Complications including haematuria, transfusion, severe pain, need for admission and need for further investigations were analysed. The data were analysed using statistical tests and IBM SPSS software.

Results:

The results of the study show that there were no significant differences between the old and new renal biopsy protocols in terms of demographics, complication rates, and side effects. Both groups had a

similar distribution of sex, ethnicity, and mean age. The majority of patients underwent outpatient procedures, and native kidney biopsies were more common than transplant biopsies in both cohorts. The overall complication rate was 2.85%, with 1.20% classified as minor complications and 1.65% as major complications. In the old protocol cohort, the complication rate was 3.6% with 36 complications, and the new protocol cohort had a complication rate of 2.1% (21 complications). There was no statistically significant difference in complication rates between the two cohorts (p=0.06). The most common complications were macroscopic haematuria, haemoglobin drop, and pain. The biopsy diagnoses varied, with acute tubular injury and IgA nephropathy being the most common findings.

Discussion:

The study compared the complication rates between the old and new protocols for renal biopsy. The study found no significant difference in complication rates between the old and new protocol cohorts, indicating that reducing bed rest post biopsy from 6 hours to 4 hours was safe. The results also showed lower complication rates than is quoted in the consent process, and in comparison to the published literature. It also establishes that day case outpatient kidney biopsy is safe even in higher risk biopsies, with no evidence of worse outcomes in patients with low eGFR. Further work is being undertaken to identify which factors correlate with higher risk of bleeding.

Poster number: 325

Submission number: 559

A collaborative regional approach to sustainable Peer Support

Eleri Wood[1], Dr Rebekah Cheung Judge[1], Mr Richard Endacott[2], Michael Diaz[3], Janette Lezada[4], Elizabeth Dalby[5], Helen Watts[6], Paul Bristow[7]

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Eleri Wood

Biography
Eleri has specialised in kidney nursing since qualifying in 2000 and is currently a Nurse Consultant at King's College Hospital, London. She works clinically in early and advanced CKD where her focus is supporting people with kidney disease to take control of their health and maximise their quality of life. This has led to a particular interest in education, decision support, and other interventions which increase patients' activation. She has led the patient-to-patient peer support service at Kings since its inception in 2005 and has a number of local research studies and quality improvement projects around peer support. She collaborates with UK kidney charities and is co-lead of the national peer support working group with the aim of ensuring everyone affected by kidney disease across the UK has access to high quality peer support.

Abstract

Introduction

Peer support is desired by and of benefit to people living with kidney disease 1 and a recommended component of kidney care in the UK 2. However, only 25% of units in the UK offer high quality peer support from trained volunteers, with lack of time, leadership, and expertise persistently cited as the barriers to the establishment and sustainability of peer support programmes 3. Because peer support is not a commissioned component of kidney care, innovative approaches are required to overcome these challenges. This abstract describes the first year of a pilot regional approach to the development and running of peer support. The aim was to increase the efficiency, quality, and availability of peer support services across the whole region through collaborative working.

Method

One kidney unit reached out to personal contacts across the region, inviting collaboration to develop a peer support network. One or more health care professionals known to have an interest in peer support in each kidney unit were approached. Snowballing of the invitation was encouraged to capture all peer support champions and enthusiasts be they professional or lay, and regardless of degree of experience. People with lived experience of kidney disease or peer support were particularly

encouraged, as were patient involvement leads. Kidney Care UK (KCUK) and the regional kidney network representatives were included. This informal group met bi-monthly and was chaired by a clinician with significant peer support leadership experience.

Results

Through 2023 meetings were held bi-monthly with participation of all seven kidney units plus KCUK and the regional network. Membership of the working group is diverse and includes 2 peer volunteers, 12 nurses, 4 doctors, 1 psychologist, 2 KCUK professionals, and 2 patient involvement leads. It will soon also include a regional peer-support co-ordinator, which is a newly created post, financed and managed by KCUK but with responsibility for collaborating with each of the kidney units on the administration and development of peer support across the region. Two trusts have begun sharing peer support volunteers. One joint training session has been held, led by the most experienced trainer in the group and attended by 24 peer volunteers and nine members of the working group. All units have progressed their peer support programme, five of them significantly (Figure 1).

Discussion

Developing and maintaining a regional, collaborative, peer support programme is a valuable way to expand the availability of peer support training and share best practice – with the ultimate outcome of enhancing collective capacity to support people living with kidney disease. Sharing of resources such as volunteers and training sessions has already begun to improve the efficiency and ease with which the needs of individuals can be met. We plan to evaluate the programme by gathering quantitative and qualitative data about process, costs, outcomes, and patient and staff experience. This will included analysis of the impact of the regional peer support co-ordinator role. To maximise sustainability of the programme we will continue to utilise digital platforms to meet, extend the "train the trainer" model, and encourage clinical leads of each renal unit to formally commit to the collaboration. We will disseminate successful components to other regions across the UK via symposia, the national peer support working group, and an emerging WhatsApp community.

FIGURE 1: Peer support service in each of the region's kidney units, comparison between January 2023 and January 2024.
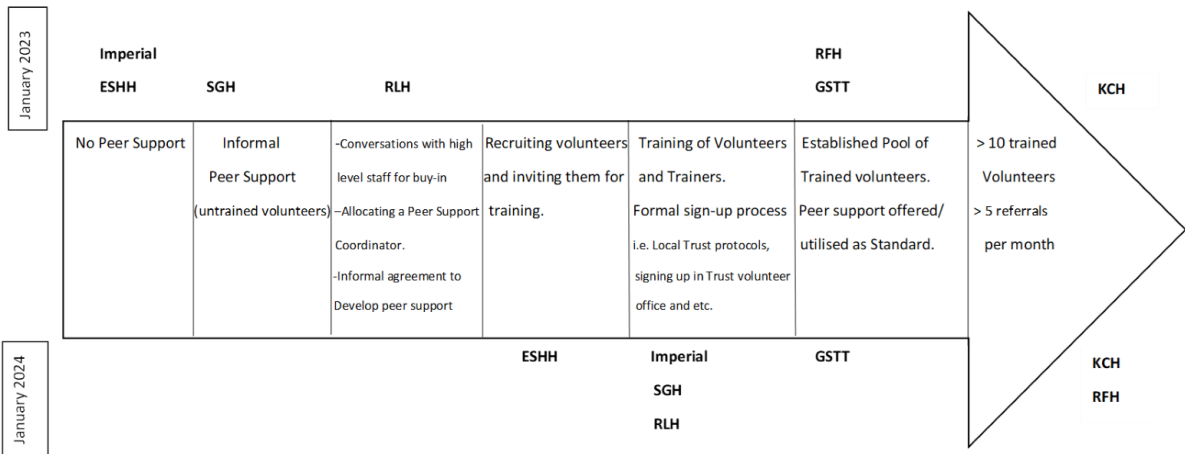
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Poster number: 326

Submission number: 565

Supporting shared-decision making for anticoagulants in people with advanced kidney disease

Miss Kathrine Parker[1], Abigail Needham[2], Professor Jecko Thachil[1], Professor Sandip Mitra[1,3], Dr Penny Lewis[3]

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Miss Kathrine Parker

Biography
Kathrine has worked as a specialist renal pharmacist at Manchester University NHS Foundation trust since 2010. In 2016 she completed her Masters in clinical pharmacy exploring immunosuppression in elderly transplant recipients. In 2019 she received a personal funding award from the NIHR to investigate anticoagulant use in advanced kidney disease as part of a clinical academic doctoral fellowship. Her other interests include drug dosing in dialysis, symptom management in advanced kidney disease, kidney transplantation immunosuppression in the elderly and PD peritonitis. Kathrine prescribes for patients on dialysis unit and in the kidney transplant clinic. Kathrine is the current co-lead for the renal pharmacy group research group, co-chairs the UKKA symptom workstream within the supportive care SIG and sits on the clinical practice guideline committee. She is the current UK Kidney Association Academic Vice President representing the multi-professional team.

Abstract

Introduction:

Patients with chronic kidney disease (CKD) are at higher risk of both thrombotic and bleeding episodes. This makes anticoagulant treatment decisions challenging. At present there are no decision support tools for patients with CKD who are initiating an anticoagulant. The aim of this work was to co-produce patient materials that can support shared-decision making (SDM) regarding anticoagulant use in CKD.

Methods:

Focus groups were used to gain the views of patients who had taken anticoagulants with an eGFR<30ml/min/1.73m2. Under 18year olds were excluded and anticoagulant use did not have to be current to capture those who may have ceased due to adverse events. Transcripts were deductively analysed based on a model of key elements of SDM derived by Makoul and Clayman, and inductively to identify any other emerging themes. Development of the patient information was an iterative process, undertaken in conjunction with kidney patients, clinicians and KP based on the main themes identified from the focus groups.

Results:

Nine participants were involved in two focus group discussions lasting 90-120minutes. All themes from the SDM model were identified which included: Explanation of the problem, presentation of treatment options and monitoring, risks and benefits, professional's recommendations, check understanding, patient preferences and arrange follow up. Six patients from the focus group agreed to support the development of patient materials. The decision from the participants, guided by a renal pharmacist, was the document would be a list of questions that patients could use for a discussion with clinicians at the time anticoagulation was initiated, table one. This would allow individualised information specific for them. Co-production of the final patient materials involved three meetings with participants. Firstly, to look at pre-existing materials and determine a preferred format, secondly to review a draft document and thirdly to agree a final version after there had been input from a haematologist and nephrologist. Recommendations for health professionals were also developed to support SDM.

Discussion:

Shared- decision making is an important element when initiating new treatments and to ensure the best outcomes for patients. NICE recommends that the first step is providing patients with information to help them think about what matters to them and questions they may like to ask during a discussion. This work provides a document, co-produced with patients and clinicians, that could be used as part of SDM for anticoagulant initiation in people with CKD. Although further testing for acceptability of this document in the clinical setting would be required this document could be used within a national guideline for anticoagulation in advanced kidney disease.

Table 1. Questions included in the final co-produced patient materials relating to shared decision making themes

Theme	Questions	Comments
Explanation of the problem	Why am I taking an anticoagulant? How long will I need to take my anticoagulant for?	
Presentation of treatment options and monitoring	What kinds of anticoagulants can be prescribed for me? What monitoring do I need to have, for example specific blood tests? Can I choose where this monitoring can be carried out?	
Risks and benefits / Factors affecting the risks	What are the main side effects? When do I need to seek medical attention? Does my diet or medicines affect my anticoagulant? What happens if I need a tooth removing or surgery?	
Professional's recommendations	None	There were no specific questions arising from this theme as it relates to how the interaction with the clinician and patient is framed. The clinician is there to make recommendations to support the patient's decision, however, the previous question 'Why am I taking an anticoagulant?' and the three questions developed for treatment options and monitoring are likely useful for patients when seeking professional recommendations to support their decision-making.
Check understanding or defer follow up	None	This requires an individual assessment from the clinician that the patient requires time to digest information and/or discuss with family/carers, as well as frank honesty from the patient highlighting to clinicians that they would like to discuss this again further.
Patients preferences	Who will follow up on my treatment?	Includes questions under the theme treatment and monitoring preferences. The final co-produced materials also contain a list of resources for patients to access specific to their needs.
Arrange follow up	Who will follow up on my treatment? Who can I contact if I need help or advice?	

Elevating patient experiences: nurturing care and ensuring satisfaction through feedback

Dr Molefe Rapalai, Dr Johann Nicholas

Shrewsbury, Shrewsbury

Dr Molefe Rapalai

Biography
Born on April 22, 1969, in Mochudi, Botswana, my early fascination with the complexities of medicine and a profound desire to aid others laid the foundation for my professional journey. Following a rigorous academic path, I pursued my medical degree at the University College Dublin. As a junior doctor, the allure of nephrology captivated my imagination, sparking a keen interest in haemodialysis and renal procedures, including dialysis catheters. My passion lies in enhancing patient outcomes, particularly in the realms of haemodialysis and renal interventions.

Abstract

Introduction

In the ever-evolving healthcare landscape, patient feedback is crucial for refining the quality of medical journeys. Notably absent in current literature is feedback specifically from kidney biopsy patients. Our study aims to fill this gap, presenting the first analysis of patient experiences in this context. Our dual objectives are to assess patient experience of the service and identify areas for improvement. By delving into the intricacies of the kidney biopsy journey, we strive to provide insights that can enhance overall care standards. This study aspires to catalyse positive changes, emphasising patient-centricity as a cornerstone for healthcare excellence.

Methods

Individuals attending the renal department for a renal biopsy (either as outpatients or already admitted) during the period from May 2022 to October 2023 were the focus of the patient experience feedback survey. The survey encompassed the patients' experiences period from the moment they became aware of the need for a kidney biopsy to 1 month after the procedure. Patient consent was secured at the time of the biopsy. The survey was administered 1 month following the biopsy, using either Google Surveys or telephone interviews for those without email access. Survey results were compiled and analysed upon the completion of the survey.

Exclusion criteria applied to individuals whose consent was not obtained at the time of the biopsy and those who were missed beyond 1 month post-biopsy.

Results

Between May 2022 and Oct 2023, 86 patients underwent kidney biopsy, with 50/86 (58.14%) participating in an experience feedback survey. Among respondents, 20/29 (69%) had biopsies within a month. Almost all (28/29, 96.6%) felt well-informed and supported, with 100% understanding the information provided. The majority (24/28, 85.7%) were discharged the same day. At the point of survey some patients reported having experienced various post-procedure symptoms, including pain (5/28, 17.8%). Results were received within 1 week by 13/29 (44.8%), and 10/29 (34.5%) within 1-2 weeks. Age distribution was 25 – over 80 years with 11/29 (37.9%) between 40-60 years, and gender distribution was 13 male and 16 female respondents. Overall, the majority expressed satisfaction with the journey, though a few reported delayed results and post-procedure symptoms.

Discussion / Conclusion

The frequently performed kidney biopsy procedure lacks published insights into their experiences and how our patients interact with the service. We aimed to gather insights over the emerging themes over the care.

The themes that emerge are:

Theme 1: Information

Crucial comprehensive information for preparedness and decision-making; 96.6% received written and verbal.

Theme 2: Consent

Highlight on adequate cooling-off for informed consent. All participants agreed

Theme 3: Procedure

Emphasises the significance of feeling supported and reassured. 28/28 respondents felt supported.

Theme 4: Managing expectations.

Identified as a crucial aspect of a positive experience.

Theme 5: Post-Procedure
All participants received vital information on potential complications; crucial for positive experience.

Theme 6: Ongoing Support

Emphasises timely results and reviews; 27/29 received results. Gaps in care noted, stressing the need for continuous support

Theme 7: Delayed Complications
Highlights addressing delayed complications post-discharge, with 21/28 reporting no symptoms. Emphasises the need for information and support post discharge.

Theme 8: Staff
Emphasises vital support from a professional, empathetic healthcare team for positive experiences.

Theme 9: Efficiency of Service

Emerged as a crucial aspect of participant satisfaction. Emphasises the importance of a streamlined and prompt healthcare service, contributing to a positive overall experience.

Poster number: 328

Submission number: 601

Improving the renal procedure patient experience with immersive virtual reality experience.

Dr Sophie Seager, Dr Jennifer Whitehead, Dr Thomas Fairhead, Dr Saeed Ahmed

Sunderland Royal Hospital, Sunderland

Dr Sophie Seager

Biography

I am currently a Foundation Year 1 doctor in the Northeast, and I graduated from Newcastle University in 2023, where I completed my MBBS. In my medical training so far, I have been interested in a variety of medical specialties. However, nephrology has stood out as fascinating and complex, with often very acutely unwell inpatients as well as patients under long term follow up in settings requiring broad multidisciplinary involvement such as the dialysis nurses, dieticians, vascular surgeons, and transplant coordinators. I am excited to learn more about the evolving specialty and I hope to be able to explore this further in the future.

Abstract

Introduction

Renal patients frequently undergo invasive procedures such as renal biopsy for diagnostic purposes or establishing access for dialysis. Procedures can be a source of anxiety for patients. Potential contributing factors are discomfort and an unfamiliar clinical environment.

In addition, procedures are often undertaken at a time of increased anxiety such as a new period of illness, a dialysis start, or following access failure. As well as impacting the patient experience, anxiety may also contribute to altered haemodynamics leading to procedure cancellation.

Studies have shown that the perception of pain is exacerbated by a patient's concentration on the painful stimuli. Existing literature supports a reduction in pain and anxiety with the use of virtual reality (VR) for medical procedures such as venepuncture.

The aim of this quality improvement project is to explore whether immersive virtual reality could improve the renal procedure patient experience with a particular focus on reducing anxiety.

Methodology

Patients in a single centre renal unit were given the option of using a VR headset from Healthy Minds. The use of the headset is supported with a standard operation procedure (SOP) document. Included in

the document are detailed instructions on the use of the headset. This means a practitioner new to the technology could implement its use.

The VR is visual and can include audio. Patients were given a choice of theme for their experience. They completed a feedback form following the use of VR. The form included a subjective quantitative measure of anxiety and a section for qualitative free text comments.

Results

Six patients completed feedback forms in this pilot study of VR. They were asked to grade their anxiety on a scale of 0 (none) to 10 (maximum) before and after the use of VR. They were also asked about their level of satisfaction overall as well as the areas of comfort, graphic quality, sound quality, and feeling of relaxation.

All of the patients experienced a reduction in reported anxiety using the VR. The majority were very satisfied with their overall experience. All of the patients wished to use VR if they required a further procedure and would recommend it to others.
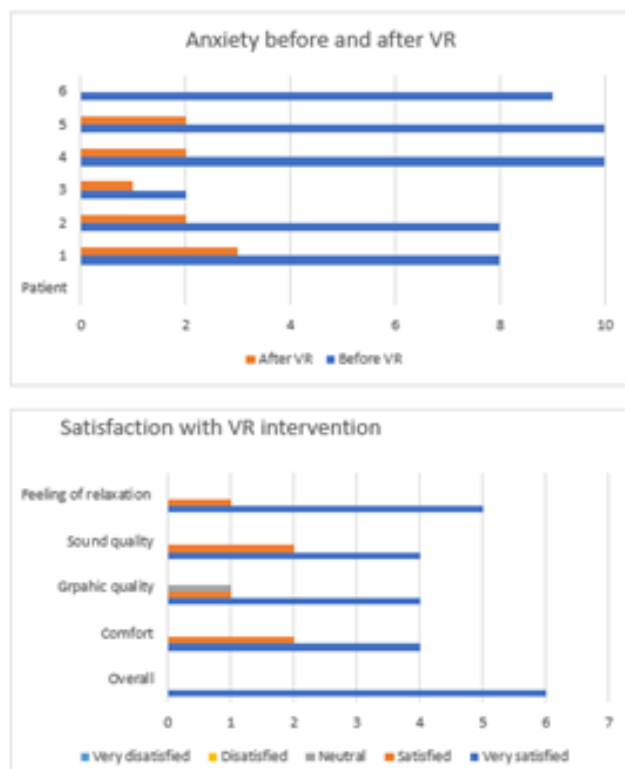
Discussion

Our results showing the benefits of VR for patients undergoing renal procedures are in keeping with other studies demonstrating reduced patient anxiety. VR is a promising intervention to improve the patient experience.

A clear advantage of VR is the avoidance of pharmacological intervention which is associated with side effects and potentially an increased length of stay. The intervention is patient-centred giving a choice of VR experience.

A limitation of our quality improvement is the small sample size. However, the initial results are promising and through a SOP with clear user instructions, VR can be efficiently implemented by other renal units.

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Poster number: 329

Submission number: 621

Development and Validation of the Kidney Symptom Burden Questionnaire (KSB-Q)

Professor Derek Kyte[1,2], Dr Benjamin Fletcher[2], Dr Mike Horton[3], Dr Sarah Damery[4], Dr Olalekan Lee Aiyegbusi[2,4,5,6], Dr Nicola Anderson[2,4,5], Mr Andrew Bissell[2], Professor Melanie Calvert[2,4,5,6], Professor Paul Cockwell[2,7,8], Dr James Ferguson[2,5], Professor Muirne Paap[9], Professor Chris Sidey-Gibbons[10], Professor Neil Turner[11], Mr Rav Verdi[2], Dr Anita Slade[2,5]

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Professor Derek Kyte

Biography
Derek Kyte is a Professor of Physiotherapy at the University of Worcester and an expert in the use of patient-reported outcomes in clinical trials and routine clinical practice.

Abstract

Introduction

Measurement of the somatic symptoms that matter most to patients with Chronic Kidney Disease (CKD) currently requires completion of multiple patient-reported outcome (PRO) measures. This may lead to questionnaire fatigue, lower levels of completion and resulting missing data. Moreover, many PROs used in CKD lack evidence of important measurement properties and were not developed using contemporary psychometric methods.

The objective of this study was to develop and validate a single accessible short-form kidney symptom burden questionnaire (KSB-Q), using a Rasch measurement approach to psychometrically assess the measurement characteristics of the item pool.

Methods

In this mixed-methods prospective study (Figure 1) the conceptual framework for the candidate item pool was developed following a global systematic review and meta-analysis of symptom burden and health-related quality of life in CKD. Somatic symptoms identified in the review were mapped to the World Health Organisation (WHO) International Classification of Functioning, Disability and Health (ICF) and cross-mapped against published qualitative literature and established CKD core outcome sets including SONG (Standardized Outcomes in Nephrology) and ICHOM (International Consortium for Health Outcomes Measurement).
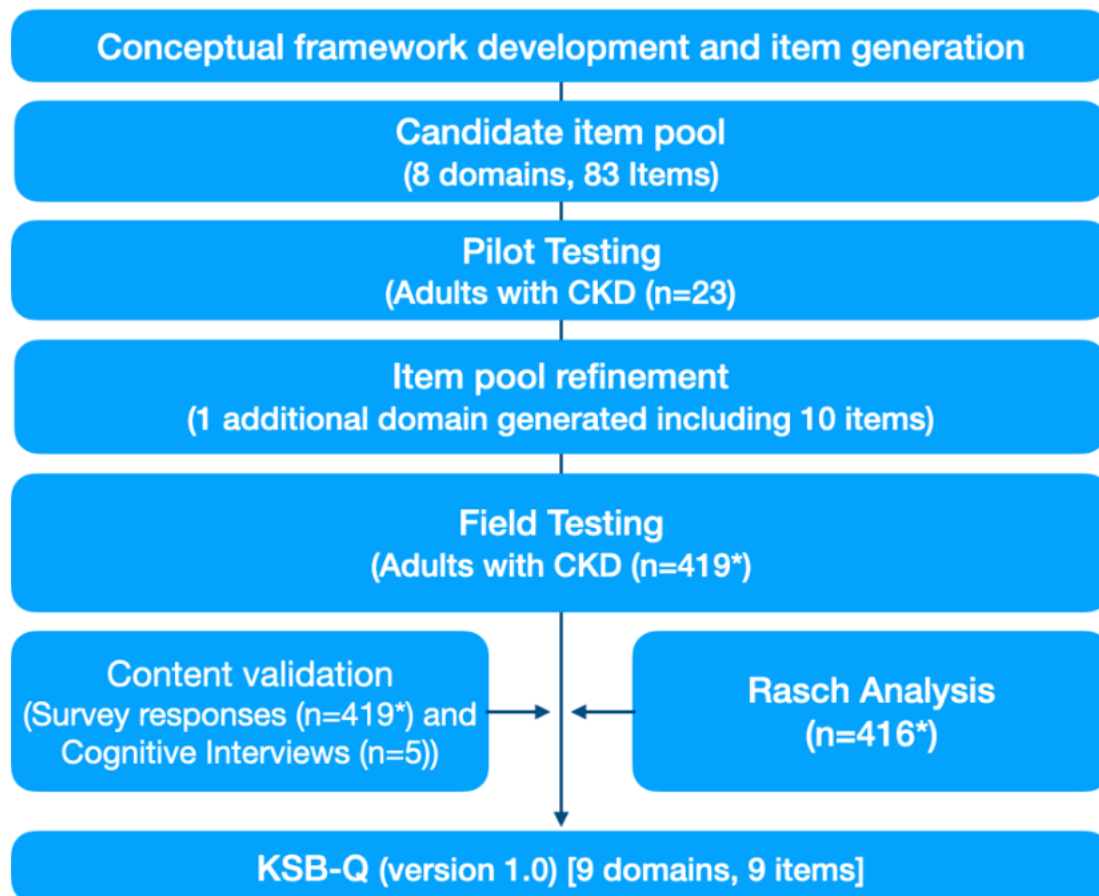
Fig 1. Development of the renal symptom burden questionnaire (KSB-Q). *Includes internal pilot data.

The results of the mapping exercise were reviewed by the study management group, which included patients (n=2), clinicians (n=4) and psychometricians/outcome methodologists (n=4). Those somatic symptom domains with both quantitative and qualitative evidence of prevalence, severity and impact were selected for inclusion in the candidate item pool.

Following a pilot, an item pool survey was distributed to adults (≥18years) with stage 3-5 CKD across 3 clinical groups: (i) not receiving kidney replacement therapy (KRT), (ii) receiving dialysis, and (iii) with a functioning kidney transplant.

Rasch analysis was conducted on the short-form KSB-Q, constructed from the 9 'root' domain-level items (fatigue, pain, memory/concentration, poor sleep, skin problems, gastrointestinal problems, dizziness, restless legs, and shortness of breath) within the candidate item pool. Cognitive debriefing interviews were conducted in order to evaluate content validity.

Results

A total of 1,464 item pool surveys were posted to patients and 419 participants returned questionnaires (29% response rate). The sample included 60% male respondents; 70% were white, with 26% reporting other ethnic backgrounds. Rasch analysis indicated that items representing 9 key symptom areas formed a fitting (chi-square p=0.12), well-targeted, reliable (PSI=0.80, Cronbach's alpha=0.87, test-retest reliability ICC=0.82, 95% CI 0.69-0.89), unidimensional (2.3% significant p=0.05 t-tests) measure of somatic kidney symptom burden (0-100 scale, higher scores representing greater burden, minimum detectable change 15.43).

The majority of survey respondents indicated that the items across the pool were relevant (81.6%), comprehensible (97.4%) and comprehensive (74.7%). Participants involved in cognitive interviews (n=5) did not raise any substantial issues with face validity, missing items, response or recall options, the design of the KSB-Q or its comprehension.

Discussion

The KSB-Q represents a short, accessible, symptom PRO with evidence of strong psychometric properties. Rasch analysis indicated that items representing 9 key symptom areas (fatigue, pain, memory/concentration, poor sleep, skin problems, gastrointestinal problems, dizziness, restless legs, and shortness of breath) formed a valid, well-targeted, reliable, unidimensional measure of somatic kidney symptom burden. Both cognitive debriefing and item pool survey responses provided evidence of content validity encompassing relevance, comprehensiveness, and comprehensibility.

Poster number: 330

Submission number: 623

Enhancing patient participation within Middlesbrough in kidney Patient Reported Experience Measure (PREM) 2023

Dr Ji Ching Lee

NA, NA

Dr Ji Ching Lee

Biography
Ji Ching Lee is currently a renal registrar working in James Cook University Hospital, Middlesborough. Having earned her BMBS degree from University of Southampton, she commenced her training in Nephrology in 2023. She embraces the holistic approach to kidney health and is committed to patient-centred approaches in kidney management.

Abstract

Introduction

In the United Kingdom (UK), patients with kidney disease are encouraged to partake in an annual survey, Patient Reported Experience Measure (PREM) via their renal unit. It provides a national overview of patient experiences, highlighting areas for improvement. Sufficient study sample size is pivotal for validity and reliability of a study as it ensures accurate population representation. In 2022, only 75 patients with kidney disease in Middlesbrough took part in this survey. The satisfactory overall score of 6.34/7, although surpassing the national average of 6.25, is potentially underrepresenting the population. This project aims to increase patient's engagement in PREM 2023 and identify staff challenges in a fully digital data collection process.

Methods

A number of action plans were implemented to increase patient participation. To enhance digital inclusion, an electronic tablet was donated to each satellite dialysis unit (SDU) in Middlesbrough. PREM leaders were appointed from each SDU with the primary responsibility to share information and provide local support to staff. Patient lists were generated for each SDU and shared on a drive online, aiding staff in patient recruitment. These new action plans were summarised in a staff poster and distributed across SDUs. Volunteers from the North East Kidney Patient Association (NEKPA) also assisted SDUs needing additional support. Online feedback forms were circulated post-PREM to gather staff experiences. Quantitatively, the project measured PREM 2023 patient participation and staff awareness of PREM posters and patient lists. Qualitatively, it aimed to uncover staff barriers in PREM recruitment, alongside staff perception towards patient barriers.

Results

PREM 2023 results, released in February 2024, saw a two fold increase in patient responses from 75 to 187 (250%), compared to 2022. 73% (11/15) of staff were aware of staff posters, while only 60% (9/15) were aware of patient list. The main challenges encountered by 60% (9/15) of staff include inadequate staffing levels and the time-consuming nature of PREM questionnaire. 13% (2/15) admitted their limited knowledge about PREM and 7% (1/7) found certain parts of the questionnaire overly personal and awkward, posing challenges for staff in assisting patients to complete the questionnaire. Staff perception of patient barriers include unfamiliarity with technology, lack of knowledge, disinterest, time consuming and lack of accessibility to internet.

Discussion

Effective communication and education among team members remained crucial for staff and consequently, patient recruitment to PREM. The PREM 2023 outcome has been communicated to all Middlesbrough SDUs, with emphasis on positive feedback to boost team morale and address areas requiring improvement. The majority of communication with staff members occurred via email and Teams meeting with SDU leaders, limiting the opportunity for personal interaction and relationship-building with SDU staffs. To overcome this, future endeavours should prioritise on-site educational visits for staff and patients. Also, patient volunteers can be an effective strategy to alleviate staff burden in patient recruitment. Further initiatives to explore barriers from patient's perspective can be valuable in impacting future patient recruitment.

PREM – Staff Information Sheet (Middlesborough)
Patient Reported Experience of kidney care (PREM) UK 2023

What is PREM

This is a national annual survey of kidney patients led by The UK Kidney Association. It aims to:
- Help teams understand how patient feels about their experience of care
- Show where improvement can be made
- Give the UKRR a national picture of people's experience of care

PREM 2023 will be launching in **11th September 2023 to 6th November 2023** across the UK

Information learnt from PREM 2022 specific to Middlesborough?

Only 75 kidney patients from all our units took part in the survey (0.7% of UK kidney patients who responded) Hence the outcome of the survey for Middlesborough might be underrepresented.

Patient scored their overall experience at our units at 6.34 out of 7, compared to national score of 6.25 out of 7

We score above the national average in communication. Other domains like privacy &dignity, access to the team, patient information, support and sharing decisions needs further improvement.

Action plan to improve patient's participation in 2023

1. PREM is going 100% digital nationally
2. Recruiting PREM champions across satellite units
3. Clear information sheet for staffs
4. Online patient participation list to be updated by PREM champions
5. Mid-survey catch up - 3rd October 2023
6. Volunteers to support satellite units

How to access NHS share drive? It's in your email.

1. Log in to your NHS email. You will have received the link to access share drive named **'PREM Middlesborough 2023'** on 'One Drive'.

2. Click the link → Access excel sheet named under your satellite unit (DO NOT download list to protect patient's confidentiality.)

3. Select **patient's name** → select the drop down box under **'Survey Completed'** column to mark the completion of survey using dropdown box.

   Provide a reason if patient declined to complete survey.

4. This is a live list that will automatically update as you fill in. You do not have to save a copy.

How you can help?

1) Make sure you can access the online share drive patient list in your unit. If you have trouble accessing, please contact jiching.lee5@nhs.net.

2) Independent patients should be encouraged to scan QR code below to complete this survey on their phone.

3) Elderly patients who struggles digitally will need help from the staffs or volunteers. Each unit will be given an ipad for this reason. Please assist them through the survey.

4) Please ensure to update your individual patient list on share drive once your patient has completed the survey.

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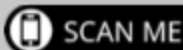
Supportive Contacts

Dr Ji Ching Lee – PREM Champion JCUH
jiching.lee5@nhs.net

Mrs Clare Allinson – PREM Champion JCUH
clare.allinson@nhs.net

Mr Brian Child – North East Kidney Patient Association Chairman
brian.child44@outlook.com

For more information, visit:
https://ukkidney.org/kidney-patient-reported-experience-measure

Poster number: 331

Submission number: 626

Using Kidney Patient Reported Experience Measure to drive quality improvement – implementing a UK programme to support and share improvement projects.

Leeanne Lockley[1], Catherine Stannard[1], Paul Bristow[2]

[1]UK Kidney Assocation, Bristol. [2]Kidney Care UK, Alton

Leeanne Lockley

Biography
I have been working with the UK Kidney Association, Kidney Quality Improvement Partnership (KQIP), for 6 years after working as a registered nurse in an acute trust for 17years. I support the North West and Yorkshire & Humber regions build QI capability, leadership and confidence.

Abstract

Introduction:

The UK kidney community has been capturing patient experience of kidney services since 2016 with the annual Patient Reported Experience Measure (PREM) survey. The annual survey is run in partnership between UK Kidney Association (UKKA) and Kidney Care UK (KCUK) and covers 13 themes of experience including Support, Transport and Communication. Each question is scored from 1 (worst experience) to 7 (best experience). The aim of the PREM is to put the patient voice at the heart of service improvement by helping teams understand how patients feel about their experience of care, showing where improvement can be made and to provide a national picture of people's experience of care.   Most theme scores nationally have remained relatively stable year on year, however these averages mask a wide variation in scores seen across centres, and changes within centres year on year. This indicates an opportunity for improvement and shared learning between centres, however the extent to which the Kidney PREM has inspired improvement activity is unknown and there is no central source for case studies or resources on improvement to patient experience. The Kidney PREM 2023 report showed just 11.9% respondents has been spoken to about the previous year's results (**Table 1**).

Table 1: Kidney PREM participants who have been spoken to about previous year's Kidney PREM report

	Question C: Spoken to about last year's Kidney PREM Frequency (%)
England	
East of England	96 (13.2%)
London	258 (10.5%)
Midlands	340 (19.4%)
North East & N Cumbria	77 (10.5%)
North West	66 (8.4%)
South East	115 (8.3%)
South West	113 (9.5%)
Yorkshire & Humber	79 (12.8%)
Northern Ireland	33 (14.6%)
Scotland	27 (7.5%)
Wales	88 (12.5%)
Unknown centre	57 (15.2%)
Total	**1,349 (11.9%)**

The UKKA's Kidney Quality Improvement Partnership (KQIP) team has developed a national programme - Using PREM to Drive Improvement - aiming to turn the Kidney PREM data into action.

Method:

In February 2024, a national framework of support was designed to support local improvement initiatives. This involved:

- Meeting with regional PREM champions to demonstrate what PREM data is available, how to access it, and find out what QI activity if any has been undertaken to date in response to the Kidney PREM data.
- Facilitating breakout rooms for each organisation within the participating region to look at local level data and themes and discuss action plans.
- Identifying individuals and/ or teams interested in improving kidney patient experience and what theme/s they want to focus improvement efforts on.

Results:

Three regional events have been delivered, with 56 healthcare professionals (HCP) and 7 patients in attendance. Of these, 17 HCP and 4 patients have expressed an interest in improving patient experience and joining national action learning sets (ALS) to share activity, ideas and resources around the theme of experience they are focussing on **(Table 2).**

Using PREM to Drive Improvement Events delivered	Date	Attendance - HCP	Interest in joining ALS - HCP	Attendance - patients	Interest in joining ALS - patients
East of England	14.02	23	7	2	1
Yorkshire and Humber	19.03	15	8	4	3
North East and North Cumbria	20.03	18	2	1	0

Using PREM to Drive Improvement Events planned	Date	Registration - HCP	Registration - patients
North West	24.04	15	4
Midlands	26.04	18	1
Sout East	26.04	4	0
Scotland	15.05		

We asked attendees for feedback on the events based on KQIP's principles. Of the 63 attendees so far, 32 gave feedback **(Table 3):**

Measure	Result
Rate the overall experience of the event	91% gave the event 5/5
Did this event build positive relationships	87% rated 5/5
Did this event promote patient involvement	91% rated 5/5
Did this event create a collective learning	86% rated 5/5

Conclusion:

The next steps for the Using PREM to Drive Improvement programme are:

- Host Using PREM to Drive Improvement events in remaining regional networks including Scotland, Wales and Northern Ireland
- Map out improvement efforts nationally
- Buddy up units across the UK working on improving similar areas of experience, forming action learning sets
- Create an 'Improving Kidney Patient Experience' knowledge hub where best practice, case studies and resources are shared against themes of experience
- Plan a face-to-face UK wide Kidney Patient Experience event in early 2025 to share improvements using the Kidney PREM and to plan the next round of local improvements and support.
- Develop a communication plan to provide feedback to patients under a "You said we did" model

Poster number: 332

Submission number: 627

Pilot Paediatric Patient Reported Experience Measure: results from the 2023 survey

Ms Rebecca-Leigh Flanagan[1], Ms Amanda Busby[1], Ms Lucy Mackintosh[1], Prof Ken Farrington[1], Dr David Wellstead[1], Ms Catherine Stannard[2], Ms Julie Slevin[2], Dr Ben Reynolds[3], Dr Andrew Lunn[4], Kay Elson[2]

[1]University of Hertfordshire, Hatfield. [2]The UK Kidney Association, Bristol. [3]NHS Greater Glasgow and Clyde, Glasgow. [4]Nottingham University Hospitals NHS Trust, Nottingham

Ms Rebecca-Leigh Flanagan

Biography
Rebecca-Leigh Flanagan is a research assistant at the University of Hertfordshire. Rebecca has a Psychology BSc (hons) degree and is currently supporting a number of Kidney PREM-related projects as part of their role.

Abstract

Introduction

The validated Kidney Patient Reported Experience Measure (Kidney PREM) is a national annual survey of adult kidney patients facilitated by the UK Kidney Association and Kidney Care UK. Since 2016, it has enabled individual centres to understand their patients' experience of care. Currently, no validated tools exist to capture the experiences of children/young people (CYP) or their parents/carers in paediatric nephrology centres. In 2022, the pilot Paediatric PREM (pPPREM) was developed, based on questions from the adult Kidney PREM. Following the success of the initial survey, pPPREM was repeated in 2023.

Methods

The pPPREM was unchanged from 2022, utilising existing online data collection methods used for the adult Kidney PREM. All UK paediatric nephrology centres encouraged participation by CYP aged 12 years and older and by parents/carers of CYP of all ages. For each question, participants scored their experience from worst (1) to best (7). Data were analysed to describe the demographics and responses in accordance with methods used to analyse the adult PREM.

Results

The survey was available for eight weeks in autumn 2023. A total of 312 responses were received across all 13 UK paediatric centres, 264 responses from parents/carers and 48 from CYP themselves, an 11.1% increase from 2022. All age groups (0 to 17 years) were represented and individuals from many ethnic groups participated; notably there was a higher proportion of Asian respondents than in Kidney PREM (12.5% vs 9.5%), but a lower proportion of Black patients (4.2% vs 9.0%). There were more respondents

of White ethnicity compared to the most recent UK Renal Registry data (77.2% vs 64.3%). As in 2022, over half of responses were from those not receiving kidney replacement therapy (KRT).

All themes were well scored; the highest scoring were Privacy & Dignity (6.73), Patient Information (6.54) and Access to the Kidney Team (6.49). The lowest scoring themes were Communication (5.94), The Environment (5.88) and Support (5.77). However, there was some variation in theme scores between CYP and their parents/carers (Figure 1), notably with CYP scoring more poorly in Support and Privacy & Dignity themes.

Figure 1: pPPREM 2023 theme scores by respondent type
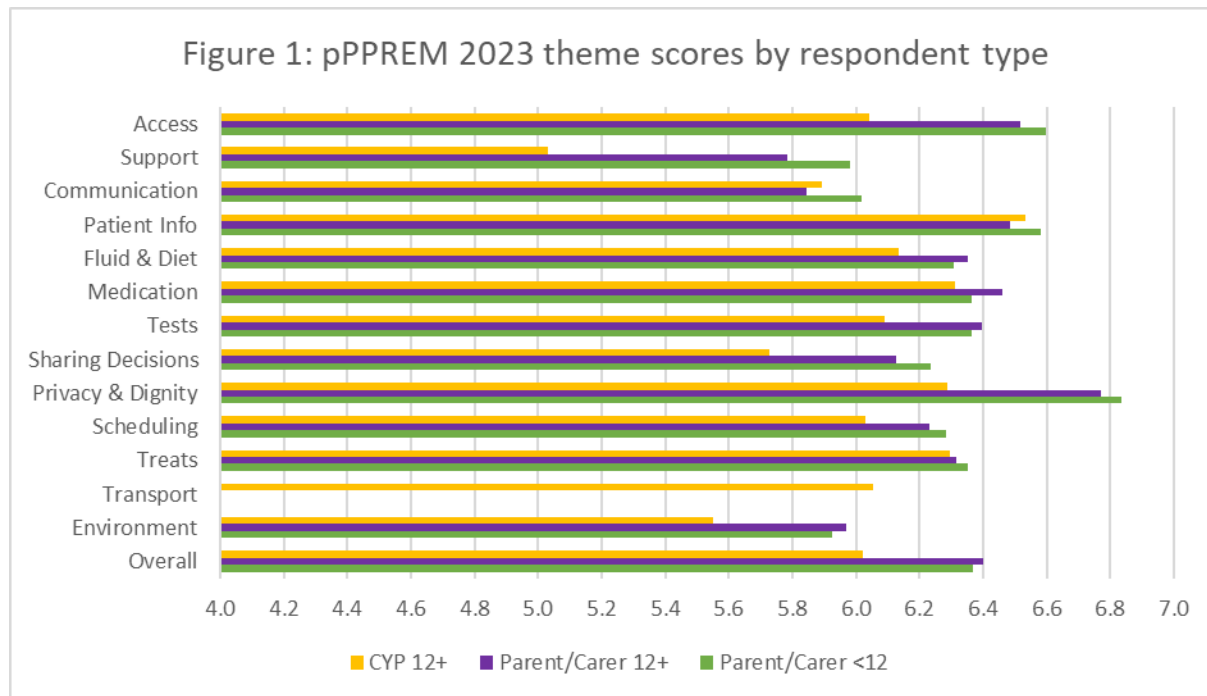
Discussion

Reassuringly, pPPREM participants at all centres scored their experience of care highly, although with some notable variation between CYP and parents/carers. Unlike the adult kidney population, CYP are more likely to have their CKD management (non-KRT) in secondary care than via their GP. The continued success of the pPPREM, with responses from all UK centres, shows that there is an appetite for measuring kidney patient experience amongst CYP, their parents/carers and renal teams.

This year, a successful NIHR funding bid was made to develop and validate questions that can be used for children under 12 years and improve questions for parents/carers and CYP over 12. The aim is to provide a measure that will guide quality improvement and improve patient care and experience. There is confidence in achieving this through continued work with a community of CYP with kidney disease, parents/carers, and healthcare professionals to achieve the long-term goal of an all-age Kidney PREM.

Poster number: 333

Submission number: 629

Driving quality improvement; the results of the additional questions in Kidney PREM 2023.

Miss Lucy Mackintosh[1], Ms Amanda Busby[1], Miss Rebecca-Leigh Flanagan[1], Catherine Stannard[2], Kay Elson[2], Paul Bristow[3], Dr David Wellstead[1], Professor Ken Farrington[1]

[1]University of Hertfordshire, Hatfield. [2]UK Kidney Association, Bristol. [3]Kidney Care UK, Alton

Miss Lucy Mackintosh

Biography
Lucy Mackintosh is a senior research assistant at the University of Hertfordshire. Lucy has a background in psychology and is currently doing a PhD investigating the impact of COVID-19 on patient experience of kidney care. Predominantly, Lucy's research focuses on patient experience of kidney care and analysing the patient free text comments in response to Kidney Patient Reported Experience Measure.

Abstract

Introduction

The national Kidney Patient Reported Experience Measure (Kidney PREM) is a validated questionnaire facilitated annually by the UK Kidney Association and Kidney Care UK, working with all UK kidney centres. Designed to embed the patient voice at the heart of local service improvement, Kidney PREM measures patient experience over 13 themes of kidney care. In 2023, as part of the drive for quality improvement, three additional questions were asked at the end of the Kidney PREM to better understand people's experience of certain aspects of their care.

Methods

The Kidney PREM working group, in collaboration with experts by experience, developed three additional, one-off questions for Kidney PREM participants (Table 1). The number of responses for each option were recorded per question. Free-text responses in Kidney PREM were coded following thematic analysis with comments relating to the additional questions being grouped under the theme *Additional Questions.*

Results

The additional questions achieved a high response rate (>97%), with 149 individuals also leaving a free-text response relating to topics covered in these questions.

A. Clinic letters:

Over half (51.4%) of participants reported that letters were sent to themselves and copied to their GPs. A further 11.9% stated that they were sent only to themselves, and 22.2% reported that letters were sent directly to the GP. However, over a tenth (12.3%) did not know who their clinic letters were sent to. Fifteen individuals commented that they received no clinic letters regarding their kidney care, and three stated they were happy to be sent their clinic letter with their GP copied in.

B. Wellbeing:

Only a third (36.8%) of respondents reported that staff had discussed their wellbeing in the previous year. Individuals describing mental health support (147 comments) reported that staff rarely asked how they were and that they were not offered mental health support (70% of comments), whilst others (24% of comments) gave examples of the kidney team showing concern for their wellbeing.

C. Last year's PREM report:

Just 11.9% of participants reported discussing Kidney PREM 2022 results at their centre. Feedback from Kidney PREM was mentioned in 25 comments with most (60%) noting they were not informed of their centre's results. The remaining 40% included examples of kidney units displaying Kidney PREM results or suggested actions for quality improvement.

Discussion

Reassuringly, progress has clearly been made on sending letters to patients, although with considerable room for improvement. It is disappointing that, despite both the Getting it Right First Time (GIRFT) initiative and Renal Service Transformation Programme (RSTP) including psychosocial support as a critical cross-cutting theme, broader patient wellbeing and mental health aspects of care are still not being routinely discussed.

Despite establishing a national patient experience survey, there appears to be insufficient patient engagement once results are published, running the risk of survey fatigue if action is not taken to keep patients updated. Kidney PREM results give centres the ability to understand where quality improvement initiatives could benefit patient experience, so centres should be encouraged to share findings with patients, working together to improve experience for all.

Table 1 – Kidney PREM Additional Questions

A. Who are your kidney clinic letters addressed to?
Me only, Me and copied to GP, GP only, GP and copied to me, Either, Don't know
B. Have your kidney team talked to you about your wellbeing in the last year? For example: benefits/housing/mental health
Yes/ No
C. Has anyone from your unit talked to you about last year's PREM report?
Yes/ No

Transplantation research

Poster number 334: WITHDRAWN

Poster number: 335

Submission number: 193

Acute Coronary Syndrome in Renal Transplant Recipients, A Retrospective Study

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Abstract

Background:Acute coronary syndrome (ACS) is associated with instant decreased flow of blood to heart causing cardiac arrest in some cases. In renal transplantrecipients it is one of the major reasons for complications and death.

Objectives:To determine the frequency of ACS in Renal Transplant Recipients (RTR).

Methodology: This retrospective study was carried out at a public kidney center in which data of patients was included from 2017 to 2022. This included previously recorded data of 450 renal transplant recepients (RTR) from a public hospital over a period of five years.Patients between 15-70 years of age of either gender admitted for renal transplant patient were included in the study. Patients with pre-existing acute coronary syndrome or with incomplete data were excluded from the study. SPSS version 23.0 was used for data analysis. For qualitative variables, mean and standard deviation were reported while for quantitative variables, frequency and percentages were reported.

Results: The findings showed that RTR were predominently male 342(76%) versus female 108(24%) from total of 450. Age wise middle aged patients were high in number 142 (31.56%). Acute Coronary Syndrome was reported in 15 (3.33%) patients. Death occured in 09 (1.86%) RTR patients of ACS. Readmission for up to 30 days were 83 (18.44%) patients, out of which 4 (4.82%) were for ACS, 3 (75%) for NSTEMI and 1 (25%) for STEMI.

Conclusion: Based on this research findigs it is concluded that ACS in RTR is worth considering a problem.

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The Kidney Transplantation in Older People (KTOP) study: impact of frailty on outcomes.

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Biography
Dr Amarpreet Thind is a Renal Registrar in Noth London and a recent Clinical Research Fellow at Imperial College London and the Imperial College Renal and Transplant Centre. Having graduated from Newcastle University in 2012 with an intercalated MRes degree, she is currently completing her PhD in geriatric nephrology. She is part of a multi-disciplinary team conducting the Kidney Transplantation in Older People (KTOP) clinical study.

Abstract

Introduction: For older people with end-stage kidney disease (ESKD), quality of life (QoL) changes from kidney transplantation (KT) may be a greater consideration than survival. Older people with ESKD are vulnerable to frailty which can impact on all aspects of KT. Achieving a better understanding of older peoples' experiences on the waitlist (WL) and following KT, and how this varies with frailty, is crucial to supporting discussions and decision making.

Methods: Kidney Transplantation in Older People (KTOP): impact of frailty on outcomes study, is a single-centre, prospective, longitudinal study. Older people (aged ≥60) activated onto the KT WL were recruited, and questionnaires assessing frailty, QoL, and patient experiences were completed on the WL (12, 24 months) and following KT (3, 12 months). Clinical event data was concurrently collected. The study was powered for detecting QoL differences. Descriptive, comparative, and mixed-effect analysis determined trajectories over time and frailty variations

Results: 210 participants were recruited, 120 of whom were transplanted;17.2% (32) were frail, 19.4% (36) were vulnerable, and 63.4% (118) were not frail. Frailty status was stable in majority on WL (63.9%) and declined in22.2%. Following KT frailty initially worsened before recovering, resulting in 49.2% maintaining the same frailty status as pre-KT, 24.6% improving, and 26.2% worsening.

A trend towards poorer WL and KT clinical outcomes in vulnerable/frail participants was observed (table 1). WL vulnerable/frail participants were more likely to experience major infection events, a single suspension episode, and spend longer suspended. After KT vulnerable/frail recipients were more likely

to have delayed graft function and poorer 12-month graft function. Additionally, participants with declining frailty status prior to KT were more likely to, and spent longer, hospitalised during the 1st year after KT.

Poorer QoL and patient experiences were reported throughout as identified frailty status worsened. On WL, QoL showed stable physical component scores (PCS) in not frail candidates, and declining scores in vulnerable/frail over time (figure 1); mental component scores (MCS) improved in both groups. . Post-KT, not frail PCS declined before recovering, whilst PCS stabilised in vulnerable/frail. MCS declined then improved in not frail recipients and worsened in vulnerable/frail (figure 1).

All recipients reported improved treatment satisfaction and less illness intrusion following KT, whilst vulnerable/frail recipients reported greater symptom burden. Generally, not frail participants experienced stability in their QoL and patient experience on the WL and following KT, whilst the vulnerable/frail participants experienced more fluctuations.

Discussion: The KTOP study has provided a holistic description of older peoples' WL and KT experiences. Frail/vulnerable older people had worse clinical outcomes and greater fluctuation in their QoL both on the WL and post-KT. KT did not drastically change QoL for either group during the first year. The KTOP study has demonstrated that assessing frailty is integral to improving older peoples' care, enabling bespoke counselling and risk assessment, and introduction of targeted interventions to optimise outcomes.

Table 1. Waitlist and transplant outcomes by frailty status.

Clinical Outcome	Not Frail	Vulnerable/Frail	p value
WL mortality	13 (23.2)	11 (33.3)	0.32
WL major infection episode	13 (23.6)	24 (72.7)	<0.001
WL single suspension episode	38 (61.3)	30 (83.3)	0.03
WL multiple suspension episodes	24 (38.7)	6 (16.7)	
WL total time suspended (days) (mean, ±SD)	307 (244)	434 (295)	0.03
Transplanted	62 (53)	36 (52.2)	0.914
KT mortality	7 (11.1)	4 (11.1)	1.0
Delayed graft function	12 (19.1)	14 (38.9)	0.03
All cause graft loss	11 (17.5)	4 (11.1)	0.06
Graft function at 12 months (ml/min/1.73m^2) (mean, ±SD)	49.9 (18.8)	39.1 (17)	0.01
KT major infection episode	34 (54)	26 (72.2)	0.07
	Change in frailty status on WL		
	Frailty status same/better	**Frailty status worse**	**p value**
Hospitalised in 1st year after KT	44 (55)	17 (94.4)	0.001
Total LoS in 1st year after KT (days) (mean, SD)	13.6 (22.6)	35.4 (38.2)	0.002

Data presented as n (%) *unless* otherwise specified. WL–waitlist, KT-kidney transplantation, LoS-length of stay, .

Figure 1. Predicted quality of life changes on the waitlist and following transplantation.
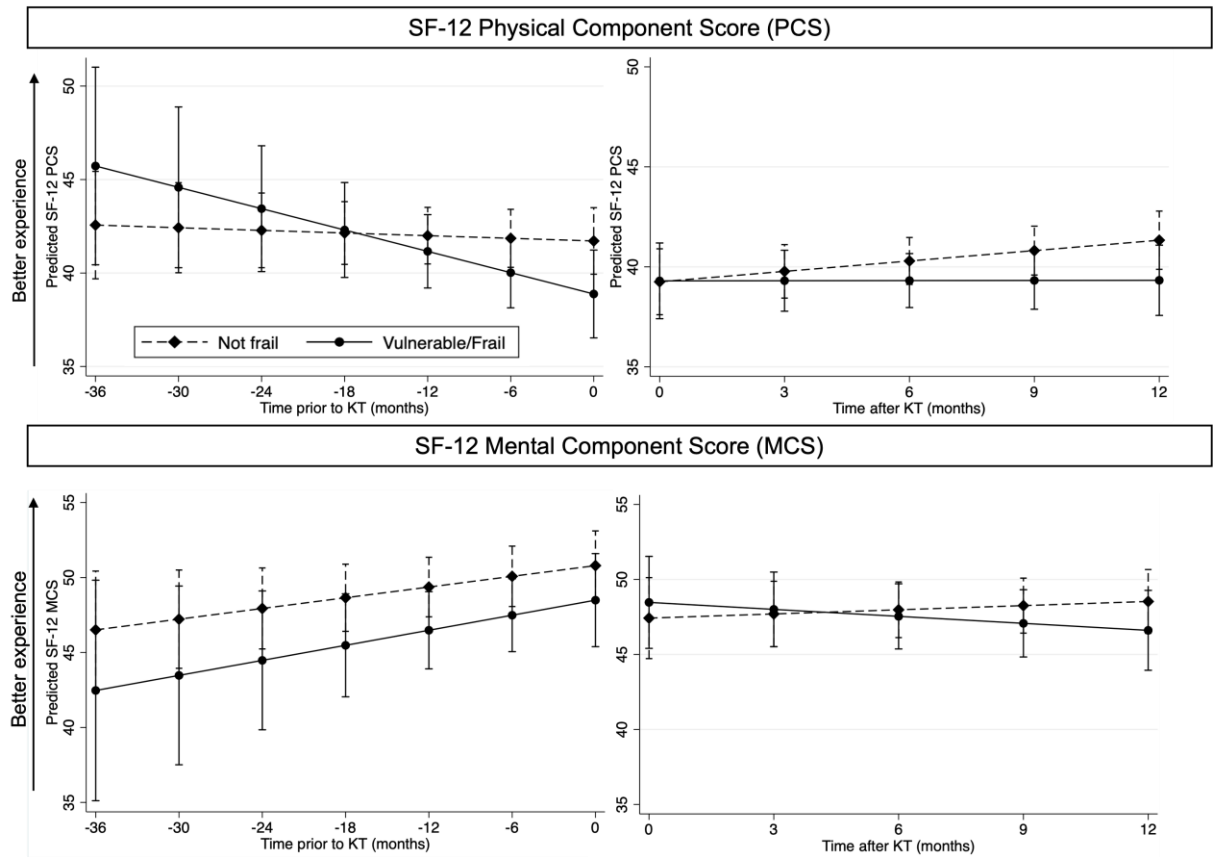
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Submission number: 290

Torque teno virus: A biomarker of immunosuppression in kidney transplantation, an observational single centre study

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Biography
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Abstract

Balancing the adverse effects of over-immunosuppression such as infection and malignancy, to the risk of rejection, remains the central challenge for day-to-day clinical practice in transplantation. A quantitative measure of immunocompetence remains elusive. In the absence of such quantitative measures, immunosuppression drug concentrations and clinical events, such as organ rejection, infection, malignancy etc. are used as surrogate markers of immunocompetence to guide therapy.

Discoveries in the human virome have brought us new opportunities; quantification of the viral load of ubiquitous viruses may be used as a surrogate marker for immunocompetence. Torque teno virus (TTV), a single-stranded DNA virus which is ubiquitous and non-pathogenic has been reported as a possible biomarker for immunosuppression in several studies. In our previous work we have demonstrated that Torque teno virus is detectable in a diverse cohort of kidney transplant recipients with BK viraemia and in them, it could be a better predictor of BK viral load than calcineurin inhibitor concentrations in the whole blood. Here we present the protocol of a single-centre study to determine whether TTV viral load can be used as a surrogate marker for immunocompetence in a diverse cohort of kidney transplant recipients in a tertiary care renal unit in the United Kingdom.

The primary outcome of the study is biopsy-proven graft rejection, with secondary outcomes being infections including bacterial, fungal, viral, and opportunistic, any new episodes of malignance cutaneous or otherwise and biopsy-proven CNI toxicity. The target n of the study is 400. We intend to measure the TTV viral load at the time of transplant and at weeks 2, 4, 6, 8, 12 and 24 weeks. The predictive power of TTV viral load will be assessed by first describing the linear association between TTV viral load and outcome episodes, and then by replacing the continuous TTV titre variable with a logical variable (greater than or less than in the pre-selected log TTV titre) The predictive power of each log level will be assessed separately either from a multivariable generalised linear model or binary logistic regression. We shall report the sensitivity, specificity, and positive and negative predictive values for different log TTV titres.

All consenting single-organ renal transplant recipients in a tertiary renal transplant centre will be eligible to participate in the study. So far, we have recruited 200 participants in this study. The median age of the recruited population is 53 years, (42.8 - 60.5 years), 40% female. 145 (72.5 %) participants have completed six months in the study, and in them, 28 (19.3%) have had at least one episode of rejection within six months. The mean time to rejection within six months is 42.3 (+/- 9) days. The population is ethnically diverse, with Afro-Caribbean and Caucasian contributing 26% each, 25% is South Asian, other constitutes 13% of the population, and the rest have not stated their ethnicity. We intend to complete recruitment by the end of 2024.
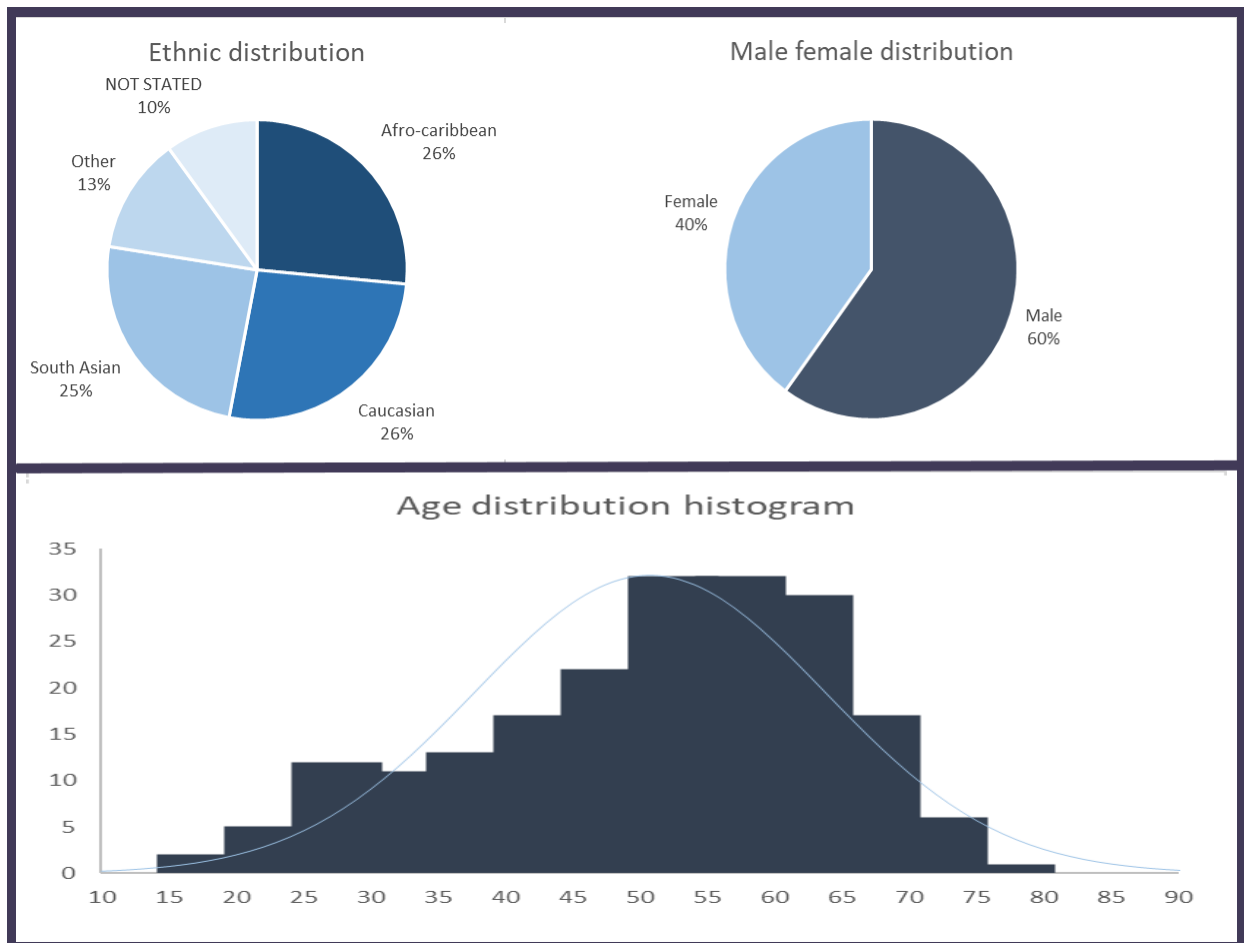
Study Registration Number

NCT05756036

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Assessing the response to antimiR-21 in a human model of kidney ischaemia reperfusion injury

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Dr Emily Glover

Biography
Nephrology trainee in the North East of England with an interest in transplantation and currently out of programme doing a PhD looking at the effect of antimiR21 in models of kidney ischaemia reperfusion injury.

Abstract

Introduction

Therapies that target ischaemia-reperfusion injury (IRI) in kidney transplantation have the potential to improve transplant survival, thereby benefiting recipients and those on the kidney transplant waiting list. MicroRNAs (miR) are potential targets through which to modulate these injury pathways and rodent studies have suggested a benefit from blocking miR-21 in kidney IRI. We have delivered a miR-21-5p inhibitor (antimiR-21) to human proximal tubule epithelial cells (PTEC) in an *in vitro* model of IRI to explore the changes in gene expression in human cells. This work will allow us to better understand its potential as a therapeutic target in this context.

Methods

PTEC were isolated from human kidneys (n=4) declined for transplantation and maintained in culture without passage. To mimic ischaemia-reperfusion, 6 days after isolation cells were incubated in 1% oxygen for 24 hours before return to normal conditions for 24-48 hours of reoxygenation. 40nM antimiR-21 or scrambled oligomer was added to cell media at the point of reoxygenation. Cell lysates were collected at end of reoxygenation and matched with normoxia controls. Paired samples were analysed by bulk RNA sequencing and data independent acquisition mass spectrometry (DIA-MS) proteomics. Apoptosis assay was performed with flow cytometry to assess toxicity from antimiR-21. Fluorescent microscopy confirmed oligomer uptake by detection of the FAM label.

Results

Over 5000 proteins were identified with DIA-MS and included in differential gene expression analysis. A high number of significantly differentially expressed genes were identified between normoxia and hypoxia-reoxygenation samples in the transcriptome and proteome. A low dose of 40nM antimiR-21 delivered at the point of reoxygenation and without the use of transfection reagents was sufficient to detect cellular uptake by fluorescence and significantly alter gene expression at both the RNA and protein level in PTEC after 24 hours. There was further differential gene expression after 48 hours of antimiR-21 treatment. These results are summarised in the Figure (adjusted p values are used). Consistency between the transcriptome and proteome is suggested and will be further explored with correlation and pathway analysis. AntimiR-21 treatment in combination with hypoxia-reoxygenation only increased cell death when hypoxia began early after cell isolation (day 4) and if antimiR-21 was given before hypoxia rather than at reoxygenation.

Discussion

We use the combination of high throughput proteomic and RNA sequencing techniques to elucidate the mechanism of antimiR-21 in human kidney cells. Differentially expressed genes identified between antimiR-21 and scrambled oligomer treatment samples have been cross-referenced with known miR-21-5p targets. This data, available at both the protein and RNA level, allows for a better understanding of how antimiR-21 exerts its effect in human PTEC. The significance of this altered gene expression will be further assessed in ex vivo human kidneys, as we have maintained normothermic machine perfusion of the kidney for 24 hours and this system has been effectively used to deliver oligomer to tubular cells.

AntimiR21 vs scrambled
24hr reoxygenation
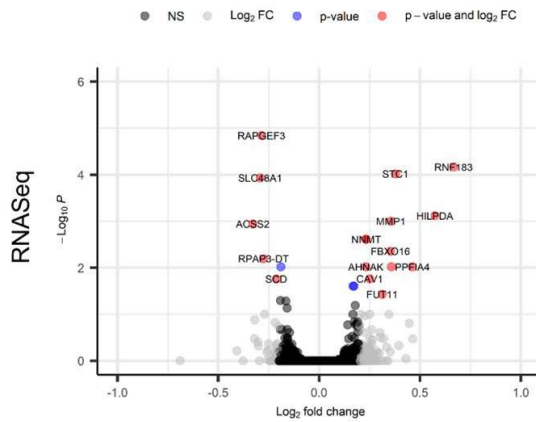
AntimiR21 vs scrambled
48hr reoxygenation

RNASeq
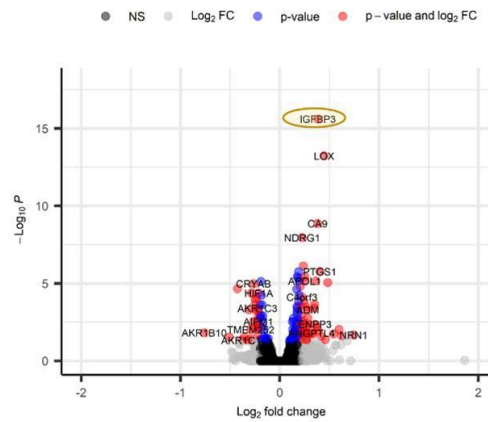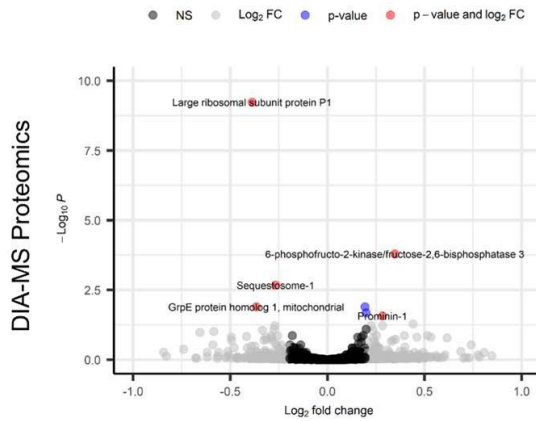
DIA-MS Proteomics
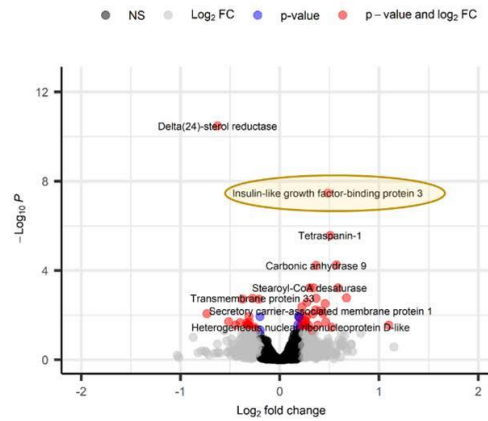
Example of gene upregulated at both RNA and protein level

Poster number: 339

Submission number: 105

Meta-analysis of Association between TCF7L2 rs7903146 and Risk of New-Onset Diabetes After Transplantation

Dr Muhammad Tassaduq Khan

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Dr Muhammad Tassaduq Khan

Biography
i am working as a transplant physician and nephrologist in karachi pakistan .i started my carrier in uk after completing my MRCP AND FRCP i did my Msc in organ transplantation and also completed my FCPS in nephrology .i have started the renal transplant program in dow university hospital and till now we have done more then 600 transplants .

Abstract

Abstract

Background: Single nucleotide polymorphisms may influence the risk of development of new-onset diabetes after transplantation (NODAT), a post-transplant clinical complication that is often implicated in allograft rejection and mortality. We performed a meta-analysis of association between TCF7L2 rs7903146 and risk of post-transplant diabetes mellitus.

Methods: A systematic search was conducted using PubMed and ScienceDirect electronic databases for studies published between January 2001 to January 2021. Case-control or cohort studies reporting association between NODAT (diagnosis based on American Diabetes Association [ADA] criteria) and TCF7L2 rs7903146 were included. MetaGenyo was used for meta-analysis (random effects model). Pooled odds ratios with 95% confidence intervals were reported to evaluate the strengths of association.

Results: Two reviewers independently screened for articles. A total of six case-control studies were included for full-text review and quantitative analysis after screening for eligibility. Genotypic distributions were in Hardy-Weinberg equilibrium for included studies. All papers reported statistically significant association of TCF7L2 rs7903146 for risk of NODAT, except for one study. There was moderate heterogeneity among studies (I^2 = 60.6%). Pooled analysis revealed 51% odds of developing NODAT with TCF7L2 rs7903146 T allele (Allele Contrast Model: OR = 1.51, 95% CI 1.13 − 2.02, adjusted *p* = 0.03).

Conclusion: The present meta-analysis demonstrated association between TCF7L2 variant rs7903146 and risk of developing NODAT. This finding may have clinical implications for individuals undergoing kidney transplantation.

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Poster number: 340

Submission number: 425

Outcomes in sensitised patients undergoing kidney transplantation with non-depleting antibody induction therapy.

<u>Miss Abigail Hobill</u>[1,2], <u>Dr Ria Nagpal</u>[1,3], Dr Alice Gage[1], Dr Maryam Javed[1], Dr Felix Karst[1], Dr Azhar Ali Khan[1], Dr Amy Needleman[1], Graham Shirling[4,1], Dr Ray Fernando[1,5], Dr Rhys Evans[1,6]

[1]Royal Free NHS Foundation Trust, London. [2]ScotGEM, St. Andrews. [3]Portsmouth Hospitals NHS Trust, Portsmouth. [4]Anthony Nolan Research Institute, London. [5]University College London, London. [6]UCL Department of Renal Medicine, London

Miss Abigail Hobill

Biography
Current 1st year medical student on the ScotGEM program. Previously worked as a qualified Physician Associate in the central London hospitals for 6 years including 18 months in Renal Medicine. Prior to clinical work she completed a Biochemistry BSc. at The University of St Andrews and an MSc. by Research Integrative Neuroscience.

Abstract

Introduction

Lymphocyte depleting antibody induction therapy is recommended for kidney transplant recipients (KTRs) at high immunological risk, which includes sensitised patients with detectable anti-HLA antibodies prior to transplantation. Data to support improved long-term outcomes with this approach are sparse. We investigated outcomes in sensitised KTRs undergoing transplantation with non-depleting induction.

Methods

Adult patients who underwent kidney alone transplantation with basiliximab induction at a single centre between 2012-2023 were included. We determined rejection rates, patient, and allograft survival at 1-, 3- and 5-years post-transplant. We compared patients who were unsensitised (cRF 0%), sensitised (cRF 1-84%), and highly sensitised (cRF 85-100%) at the time of transplantation. A further sub-group analysis was also undertaken to determine outcomes in very highly sensitised recipients (cRF 98-100%).

Results

1348 KTRs were included; of these 859 (63.7%) were unsensitised, 344 (25.5%) were sensitised, and 145 (10.8%) were highly sensitised. Highly sensitised patients were more commonly female, of black ethnicity, a higher proportion had undergone transplant previously, and fewer had a living donor transplant. Patient and allograft survival were not different between sensitisation groups (**Figure a-c**). Rejection in the first year occurred in 17 (15.2%) highly sensitised patients, 22 (8.0%) sensitised patients,

and 55 (8.5%) unsensitised patients (p=0.07). BK and CMV viremia were not different between groups. Rejection free allograft survival over 5 years was worse in highly sensitised patients (**Figure d**). The difference in rejection free allograft survival was exaggerated in very highly sensitised recipients; however, this did not translate into differences in patient or allograft outcomes (**Figure e-h**). In multivariable analyses, highly sensitised patients had an increased risk of rejection (HR 1.73, 95% CI 1.02-2.83) but this was not the case for sensitised patients nor did any degree of sensitisation impact patient or allograft survival over 5 years.

Discussion

Sensitisation at the time of transplant did not impact patient or allograft survival in KTRs undergoing induction with basiliximab. This supports the use of non-depleting antibody induction even in sensitised KTRs.
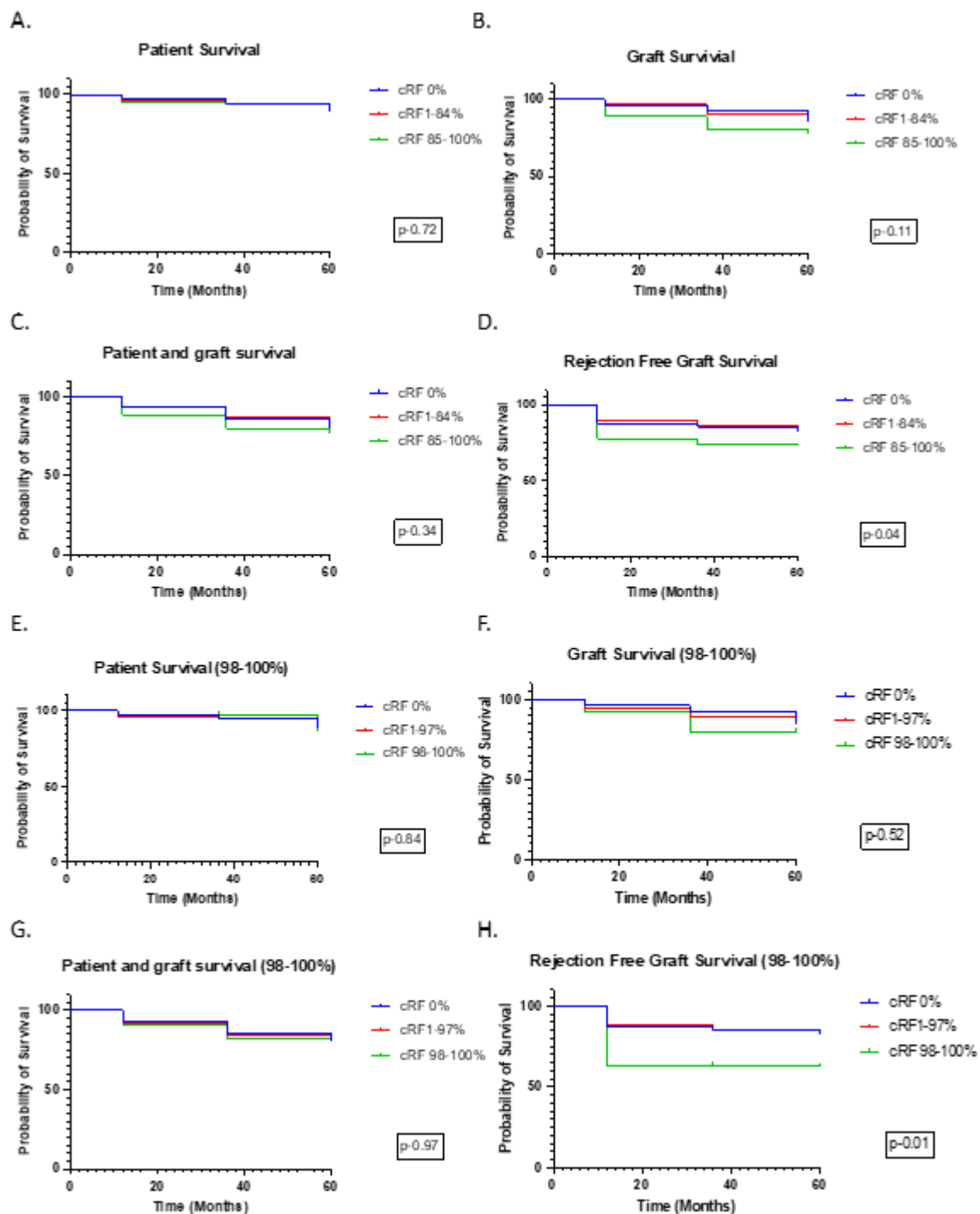
Figure: Patient survival (**a**), allograft survival censored for patient death (**b**), patient and allograft survival (**c**), and rejection free allograft survival (**d**) in unsensitised (cRF 0%), sensitised (cRF 1-84%), and highly sensitised (cRF 85-100%) KTRs. The same outcomes are plotted for unsensitised (cRF 0%), sensitised (cRF 1-97%), and very highly sensitised (cRF 98-100%) KTRs (**e-h**).

Poster number: 341

Submission number: 573

Causes and factors associated with early graft loss in kidney transplant recipients

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[1]Royal Free NHS, London. [2]ScotGEM in St Andrews, Edinburgh. [3]King's college Hospital, London. [4]University of Arizona, Arizona

Dr Maryam Javed

Biography
I am working as a senior clinical fellow in nephrology at Royal Free NHS, London. Previously I have completed post-graduation (FCPS Nephrology) from Pakistan. I have also completed MRCP UK, ESE Neph.

Abstract

Introduction: Improvements in immunosuppressive protocols, surgical techniques and careful recipient selection have resulted in excellent short-term outcomes for kidney transplant recipients. However there have been only modest improvements in the longer-term survival of transplanted kidneys, meaning many patients will require a second transplant or return to dialysis, with known poor outcomes for patients in the period after allograft loss. Understanding the factors associated with early graft loss and its predominant causes therefore requires special consideration. In this study we investigated the reasons for early graft loss in kidney transplant recipients and compared donor and recipient characteristics between the graft survival and early graft failure groups.

Methods: Patients undergoing kidney alone transplantation at a single UK centre between 2012 and 2019 were included. Demographic and clinical data were recorded prospectively. We compared variables between patients who had graft failure (return to dialysis or re-transplantation) within 1-5 years of kidney transplantation to those who had a functioning graft at 5 years. Moreover, we determined the causes of graft failure in this timeframe. Patients who died with a functioning graft were excluded from the analysis.

Results: 591 patients were included, consisting of 527 patients with allograft survival to 5 years and 64 patients who had graft failure at 1-5 years. Recipient age, sex, ethnicity, and cause of native kidney disease were not different between the groups. There was a trend to more pre-emptive kidney transplantation in those with allograft survival with shorter dialysis times pre transplantation in this group (**Table 1**). Donor characteristics (living vs deceased, standard vs extended criteria), HLA mismatch, and levels of sensitization were also not different between groups. Delayed graft function was more common in patients with graft failure and creatinine at 1- year post-transplant was higher in the graft failure group. Intra-patient tacrolimus variability at 1 year and rejection (both T-cell and antibody-mediated) at 1-5 years post-transplant were higher in patients with graft failure; infectious and cardiovascular complications were not different between groups. The predominant cause of allograft

failure was rejection, occurring in 35 (54.7%) cases (**Table 2**). Chronic injury (IFTA), infections, and recurrent disease were the cause of graft failure in 13 (20.3%), 5 (7.8%) and 5 (7.8%) cases respectively.

Discussion: Rejection represents the major cause of early graft failure in years 1-5 post kidney transplantation. Higher intra-patient tacrolimus variability and rejection in those with allograft failure supports further efforts to address medication adherence in kidney transplant recipients. Our data also highlight the need for better treatments for rejection occurring after the first post-transplant year.

Table 1: Clinical variables in patients with graft survival to 5 years and patients with graft failure group at 1-5 years post transplant

Baseline characteristics	Graft survival (Control group)	Graft loss at 1–5 year post transplant	P value
Median (IQR) or N (%)	N=527 (89.1%)	N=64 (10.8%)	
RECEPIENT DETAILS:			
Age at transplant	50(18-78)	47(20-78)	0.554
Gender -Male -Female	342(64.9%) 185(35.1%)	37(57.8%) 27(42.2%)	0.265
Ethnicity -White -Asian -Black	233(44.2%) 155(29.4%) 139(26.4%)	27(42.2%) 14(21.9%) 23(35.9%)	0.213
Cause of native kidney disease DM Non-DM	103(19.5%) 424(80.5%)	15(23.4%) 49(76.6%)	0.462
BMI	25.5(16-41.1)	25.65(15.6-39.7)	0.810
Dialysis before transplant -HD -PD - Pre-emptive Tx	274(52.0%) 106(20.1%) 147(27.9%)	40(62.5%) 15(23.4%) 9(14.1%)	0.060

Time on dialysis (days)	815 (3-5958)	1137(73-3026)	0.069
cRF% <1 1-84 >85	312(59.2%) 156(29.6%) 59(11.2%)	36(56.3) 19(29.7%) 9(14.1%)	0.782
No. of grafts 1 2 3 4	455(86.3%) 60(11.4%) 9(1.7%) 3(0.6%)	56(88.9%) 7(11.1%) 0(0.0%) 0(0.0%)	0.431
DONOR DETAILS:			
Donor type -Live donor -DBD	155(29.4%) 228(43.3%)	13(20.3%) 29(45.3%)	0.256

Cause of death in deceased donor -Trauma -Cardiovascular -Other	50(13.7%) 292(79.8%) 24(6.6%)	5(9.8%) 42(82.4%) 4(7.8%)	0.708
ECD	58(11.0%)	9(14.1%)	0.529
HLA Mismatch 0 1 2 3 4 5 6	39(7.4%) 26(4.9%) 106(20.1%) 197(37.4%) 114(21.6%) 30(5.7%) 15(2.8%)	4(6.3%) 3(4.7%) 16(25.0%) 20(31.3%) 16(25.0%) 3(4.7%) 2(3.1%)	0.941

Cause of death in deceased donor -Trauma -Cardiovascular -Other	50(13.7%) 292(79.8%) 24(6.6%)	5(9.8%) 42(82.4%) 4(7.8%)	0.708
ECD	58(11.0%)	9(14.1%)	0.529
HLA Mismatch 0 1 2 3 4 5 6	39(7.4%) 26(4.9%) 106(20.1%) 197(37.4%) 114(21.6%) 30(5.7%) 15(2.8%)	4(6.3%) 3(4.7%) 16(25.0%) 20(31.3%) 16(25.0%) 3(4.7%) 2(3.1%)	0.941
Post-transplant variables:			
Graft function -PGF -DGF	407(78.3%) 113(21.7%)	36(56.3%) 28(43.8%)	**<0.0001**
Induction agent -Basiliximab -Campath -ATG -Unknown	516(97.9%) 4(0.8%) 6(1.1%) 1(0.2%)	516(97.9%) 4(0.8%) 6(1.1%) 1(0.2%)	0.286
Creatinine at 1 year	122(79-378)	180(45-459)	**<0.0001**
Tac variance (Tac IPV) At 1 year	23.8(0-215)	30.79(9.93-97.03)	**<0.0001**
TCMR	44(8.5%)	22(34.4%)	**<0.0001**
ABMR	11(2.1%)	9(14.1%)	**<0.0001**
CMV viremia (>3000 copies/ml)	120(23.4%)	11(17.2%)	0.261
BK viremia (any level)	46(9.5%)	9(14.5%)	0.2113
Malignancy inc. PTLD	41(7.8%)	3(4.7%)	0.611
Cardiovascular Event	22(4.2%)	6(9.4%)	0.108

Table 2: Incidence of causes of graft loss after one year of kidney transplantation

Causes of late graft loss	N- 64
Rejection:	35(54.6%)
-TCMR	22 (62.85%)
-ABMR + Transplant glomerulopathy	13(37.14%)
Infections:	05(7.8%)
1. BK nephropathy	03 (60%)
2. Pyelonephritis	02 (40%)
IFTA	13(20.3%)
Recurrent GN	5(7.8%)
Unresolved AKI/ATN	4(6.2%)
Unknown	2(3.1%)

Poster number: 342

Submission number: 518

Live image-based machine learning uncovers clinically relevant sources of protection against nutrient deprivation in a human model of ischemia reperfusion injury (IRI)

Carmen Cusack, Dr Harry Horsley, Dr Enriko Klootwijk, Professor Alan Salama

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Carmen Cusack

Biography
Final year PhD student at UCL, based with the Royal Free Hospital, utilizing deconvolution laser scanning confocal microscopy and machine learning approaches to uncover potential drivers of injury and therapeutic targets in human renal proximal tubular cells.

Abstract

Introduction:

During renal transplantation, kidneys are unavoidably subjected to periods of hypoxia accompanied with nutrient deprivation, followed by periods of reperfusion, associated with an influx of immune cells and, thus, further aggravation of renal injury. Dynamic events affecting single cell populations can provide better understanding of potential drivers of injury and highlight novel therapeutic targets. We have already shown, in an Ischaemia-Reperfusion(I/R) model, that most proximal tubular injury is related to nutrient deprivation rather than hypoxic injury and can be averted by supplementation with foetal bovine serum. Live imaging of renal proximal tubular cells analysed with supervised computer vision represents a potential avenue to explore structural, dynamic and temporal information during injury. The aim of this research was to utilise live deconvolution laser scanning confocal microscopy and supervised machine learning (ML) algorithms to determine the degree of protection offered by serum supplementation in an *in-vitro* model of I/R injury.

Methods:

Primary proximal tubular epithelial cells (PTCs) isolated from nephrectomies were exposed to Hanks Balanced Salt Solution (HBSS) in hypoxic (1% O2) conditions for 72h, with or without human AB serum. PTCs were reoxygenated (21% O2) for 24h in complete Dulbecco's Modified Eagle Medium (DMEM), mimicking the restoration of blood and nutrient supply. A supervised ML random forest pixel classifier model was trained to extract cellular morphometric and injury data.

Results: Machine learning tools are useful in detecting subtleties missed by standard image analysis tools such as image J, including cell number estimation and morphometry, which can affect downstream analysis (Fig. 1). Nutrient deprivation is associated with increased cell death and injury, independent of

hypoxia, which is partially protected by human AB serum (Fig. 2) (p=<0.05). This is in agreement with data we previously collected demonstrating protection by foetal bovine serum.
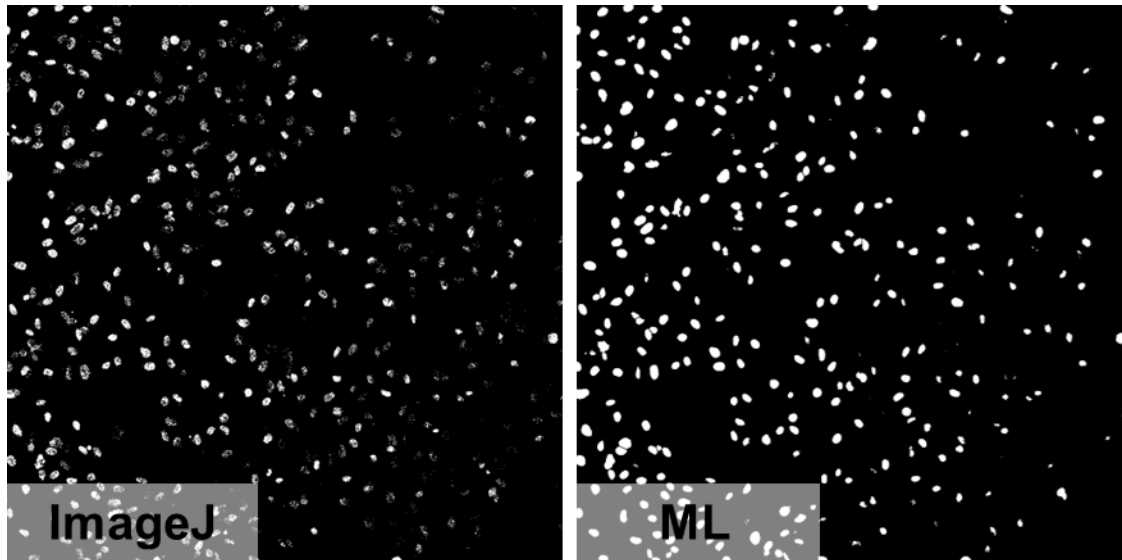
Figure 1: A) Binary mask of PTCs generated by ImageJ (standard imaging analysis programme), B) Binary mark of PTCs generated by Ilastik (supervised machine learning programme)
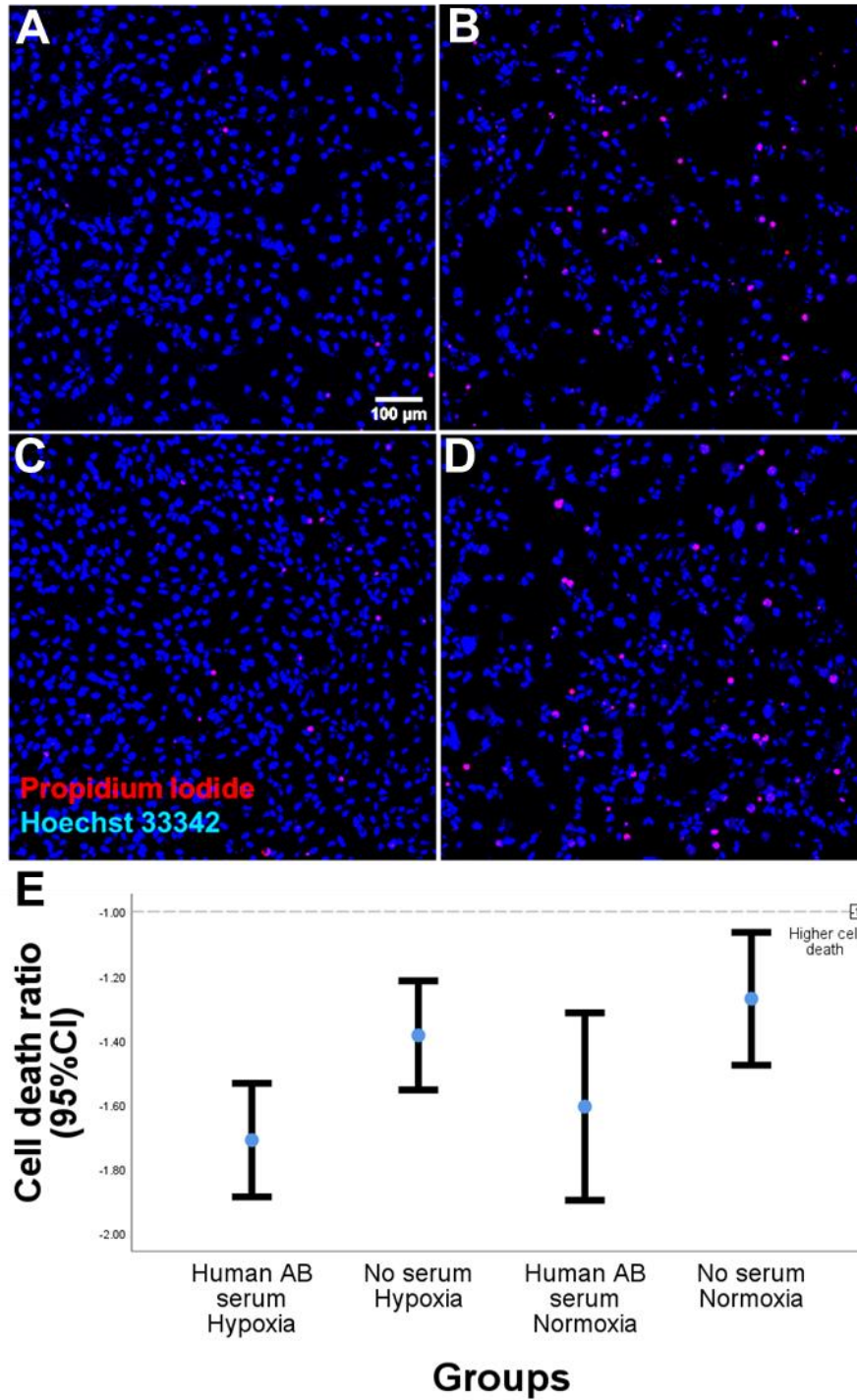
Figure 2: PTCs exposed to Normoxia (A&B) and Hypoxia (C&D) for 72h in Hanks Balanced Salt Solution (HBSS) to mimic nutrient deprivation, with (B&D) and without (A&C) human AB serum, followed by reoxygenation for 24h in complete Dulbecco's Modified Eagle Medium (DMEM). Cells stained with

Propidium iodide (Red) and Hoechst 33342 at 10x Magnification, scale bar 100μm, Cell death ratio=Propidium iodide/Nuclei, p=<0.05.

Discussion:

Live imaging and machine learning algorithms have demonstrated that AB serum offers partial protection of renal tubular injury in an *in-vitro* model of I/R. Thus, supplementing kidneys with components found within human AB serum may represent a clinically viable option for maximizing renal protection during transplantation to reduce delayed graft function.

Poster number: 343

Submission number: 532

Transplant outcomes in the context of BK screening following kidney transplantation.

Dr Emma Cannon, Dr Trijntje Rennie, Dr Paul Phelan

The Royal Infirmary of Edinburgh, Edinburgh

Dr Emma Cannon

Biography
I am a Renal Medicine trainee and I am currently out of programme undertaking a period of research focusing of factors impacting transplant outcomes in the Royal Infirmary of Edinburgh.

Abstract

Introduction

Reactivation of BK virus following kidney transplantation is associated with BK virus associated nephropathy (BKVAN) and graft loss. KDIGO guidelines recommend BK screening post kidney transplant. However, practice across the UK varies. Since November 2015, routine screening for BK virus is carried out in our unit for the first five years post transplantation. We aimed to review the BK virus pickup rate through screening and to assess transplant outcomes.

Methods

This was a retrospective cohort study including kidney transplant recipients (KTR) transplanted between November 2015 and July 2020. Screening was carried out monthly in months 1-6, then three monthly until the end of year 2, and six monthly in years 3-5.

Outcome data were collected from electronic patient records and analysed in RStudio$^{©}$.

Definitions: *BK viraemia:* any detectable BK PCR. *Significant BK viraemia:* any detected PCR that had resulted in a change in immunosuppression. *Clearance of BK:* two consecutive BK PCR results of "Not Detected". *BKVAN:* biopsy proven or documented clinical diagnosis.

Results

Cohort: There were 192 KTR included. Mean follow up time was 3.8 years. Of these KTR, 58 (30%) had BK viraemia and 40 (21%) had significant BK viraemia. There were no differences in sex, age or use of induction agent between those with significant viraemia (n=40) and those without (n=152).

Outcomes: There was no difference in mean MDRD eGFR between these groups at six months, one year or two years post-transplant.

All **significant BK viraemia** was detected in the first 24 months post-transplant, median time to detection was 94 days (IQR = 66-179 days). Median initial BK PCR was 1271 copies/ml (IQR 500-5213 copies/ml). Median peak BK PCR was 5323 copies/ml (IQR 1724–43744 copies/ml). BK virus was cleared in 90% of KTR (n=36) with a median duration of viraemia of 4.5 months (IQR = 2.9–10.8 months).

BKVAN: Seven KTR developed BKVAN but there was no graft loss secondary to this. These KTR had BK detected earlier, median peak PCR was significantly higher, fewer KTR cleared BK and the duration of viraemia was longer (*see Table 1*) compared to those with significant BK viraemia but no BKVAN.

Acute Rejection (AR): The rate of AR was comparable between KTR with significant viraemia and those without (12.5% (5/40) vs. 15.1% (23/152) (p = 0.867)). Two of the five KTR with significant viraemia and AR had BK detected after the reduction in immunosuppression, at 53 days (112 days post-transplant) and 2.6 years post first positive PCR. The other three had BK detected following additional immunosuppression for management of AR.

Discussion

Screening detected significant viraemia in 21% of KTR, with the majority of these cases picked up in the first 6 months post-transplant. Incidence of BKVAN was 3%, with no associated graft loss. KTR who developed BKVAN developed viraemia earlier, with higher peak PCR results and longer duration of viraemia. Screening appears to enable early detection and facilitate clearance of BK viraemia, while maintaining stable graft function. Reduction in immunosuppression was not associated with increased AR rate in this cohort.

Table 1 - BK PCR findings in those with BKVAN and those without

	BKVAN (n=7)	Significant BK viraemia but no BKVAN (n= 33)	
Median time to detection of BK	63 days (IQR 60-76 days)	105 days (IQR 77 - 186 days)	p = <0.05
Median Initial BK PCR (copies/ml)	10,000 (IQR 2129 – 13,393)	1059 (IQR 500 – 2907 copies/ml)	p = 0.098
Median Peak BK PCR (copies/ml)	239,913 (IQR 59,828 – 507,556)	3315 (IQR 1239 – 17,349)	p = <0.05
BK virus cleared	n= 5 (71%)	n = 31 (94%)	p = <0.05
Time to BK clearance	16 months (IQR 6.9 – 28.5 months)	4 months (IQR 2.7 – 10.5 months)	p = <0.05

Poster number: 344

Submission number: 543

Contemporary management and outcomes after first cutaneous squamous cell carcinoma in UK kidney transplant recipients: a multi-centre cohort study

<u>Dr Tom Crisp</u>[1], Dr Emilia Peleva[2], Dr Khizr Nawab[3], Dr Maria Angela Gauci[4], Dr Jonathan Gamble[5], Dr Buddhika Wijayawickrama[2], Dr Rabiah Ahmed[6], Dr Jim Moriarty[7], Dr Rubeta Martin[8], Dr Rachel Abbott[9], Dr Amrit Darvey[10], Dr Faridah Shah[6], Dr Charles Archer[8], Dr Nina Muirhead[11], Dr Alex Owen[7], Dr Nitin Bhandary[3], Dr Harry Wakefield[3], Dr Adarsh Babu[7], Dr Elizabeth Wallin[6], Dr Adnan Sharif[6], Dr Sian Griffin[5], Dr Raj Thuraisingham[2], Dr Pippa Bailey[4], Professor Catherine Harwood[2], Dr Matt Bottomley[12,13]

[1]Royal Sussex County Hospital, Brighton. [2]Barts Health NHS Trust, London. [3]Berkshire Kidney Unit, Reading. [4]Richard Bright Renal Service, Bristol. [5]Department of Nephrology and Transplant, Cardiff. [6]UNIVERSITY HOSPITALS BIRMINGHAM, Birmingham. [7]GLOUCESTERSHIRE HOSPITALS, Gloucester. [8]Oxford University Hospitals, Oxford. [9]Cardiff and Vale University Health Board, Cardiff. [10]University Hospitals Bristol NHS Foundation Trust, Bristol. [11]Buckinghamshire NHS trust, Buckinghamshire. [12]CAMS Oxford Institute, Nuffield Department of Medicine, University of Oxford, Oxford. [13]Oxford Kidney Unit, Oxford

Dr Tom Crisp

Biography
Tom Crisp (MBBS) graduated from King's College London in 2017. After working in the South Thames region for his foundation years, he worked for 2 years in New Zealand, as a Medical registrar, rotating through Cardiology and Nephrology, and an Emergency Medicine registrar in Waikato District Health Board and Dunedin hospital respectively. After returning to the UK, he worked as a clinical fellow in the Oxford Kidney Unit. Tom is currently undergoing his Internal Medicine training in UH Sussex NHS trust with a view to applying for speciality training in Renal medicine.

Abstract

Skin cancer is the most common post-transplant malignancy[1], with recipients up to 250 times more likely to develop cutaneous squamous cell carcinoma (CSCC) than immunocompetent cohorts. Those who develop CSCC demonstrate increased risk of further malignancy and mortality[2], though previous work regarding outcome after first CSCC is limited by its single-centre nature, or collection of data over a long time period, making analysis of contemporary trends difficult. Uncertainty also remains regarding optimal secondary prevention strategies in this cohort.

To address this knowledge gap, the COAST (Contemporary Outcomes After Skin cancer in Transplant) multicentre retrospective cohort study is evaluating contemporary physician management and patient outcome after first CSCC in UK kidney transplant recipients (KTR).

Data was collected from 139 patients from 8 centres, including 5 transplant centres, using a standardised data collection proforma and prior to compilation by the co-ordinating centre. Adult KTRs with a first-ever histological diagnosis of CSCC during the period 2016- 2020 were included. The follow up period was from first CSCC to the first occurring endpoint of last clinic follow up, death, graft loss or 31st December 2022. Outcomes of interest were keratinocyte and non-keratinocyte malignancy development, graft loss and death.

Cohort demographics were consistent across centres. Median (Interquartile range, IQR) age was 63 (57-72), 94.2% of cases were white, and 76.2% were male. 49% had a previous Actinic Keratosis (AK) diagnosis. Most of the cohort were taking an immunosuppressive regime of a calcineurin inhibitor and an antimetabolite (42% of which were on azathioprine) at time of first CSCC, with a median (IQR) cumulative immunosuppression duration of 136 (71-202) months. 47.5% of the cohort were also receiving corticosteroids. 14% of first CSCC were high risk (T2b or T3) based on Brigham and Women's Hospital (BWH) CSCC histology staging.

33% of cases had immunosuppression modification within 6 months of SCC diagnosis, of which 89% had IS reduced. 10.1% commenced systemic chemoprevention (e.g. retinoids) whilst 28% commenced topical chemoprevention (mostly 5-FU). Approach to immunosuppression modification, topical, and systemic chemoprevention varied across centres (Fig. 1A).

A

Management after first CSCC diagnosis by centre

B

CSCC-free survival after first CSCC, stratified by tumour grade (high grade (1) vs low grade (0))

C

CSCC-free survival after first CSCC, stratified by immunosuppression reduction (Reduced vs No)
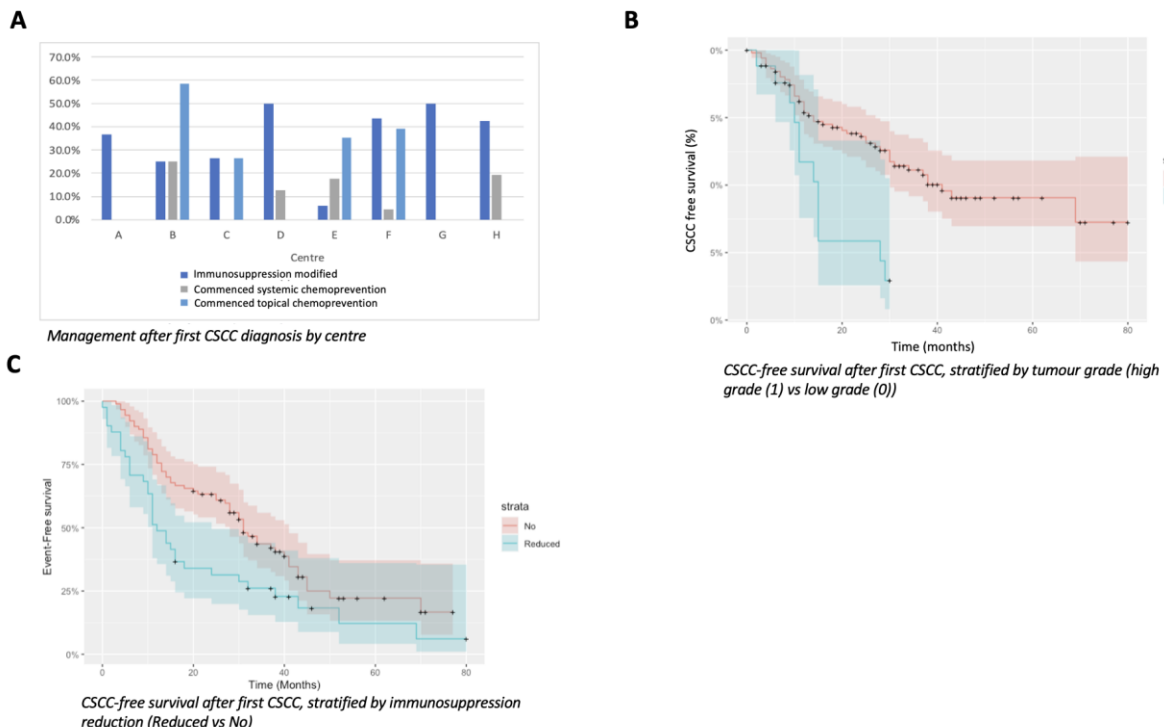
Median (IQR) follow-up duration was 39 months (27-54). 47.5% had further CSCC diagnosis, with median time to diagnosis of 13.5 months (9-27). 15.8% of patients developed metastatic CSCC. 29.5% of patients died during follow-up (median (IQR) time 23 months (2-35)). On univariate analysis using Cox Proportional Hazard modelling, previous diagnosis of AK (Hazard Ratio (HR) 1.83, 1.10-3.05), high grade BWH (HR 2.93, 1.52-5.64, Figure 1B), use of tacrolimus at CSCC diagnosis (HR 0.40, 0.17-0.94), and reduction of immunosuppression (HR 1.94, 1.15-3.25, Figure 1C) were significantly associated with altered risk for further CSCC. Multivariate adjustment revealed previous AK diagnosis, high-grade CSCC and immunosuppression reduction were associated with further CSCC. High grade CSCC and immunosuppression reduction were also significant for a composite of adverse outcomes including death, graft loss, non-keratinocyte cancer and metastatic CSCC.

In summary, high grade first CSCC, previous skin conditions, and immunosuppression regimen modification were significant univariate predictors of further CSCC in KTRs with a diagnosis of first CSCC. Further analysis for residual confounding is ongoing. Outcomes in these KTR remain poor compared to historical cohorts despite modern changes in the demographics of the KTR population and advances in CSCC treatment[3]. This may reflect therapeutic equipoise amongst specialists with regards to management of this population at high-risk of adverse outcomes.

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Study Registration Number

IRAS Project ID: 315437

HRA approval number: 22/HRA/3782.

Poster number: 345

Submission number: 550

The Natural history of Urinary Tract Infections in Kidney Transplant recipients

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NHS Greater Glasgow and Clyde, Glasgow

Dr Ala Eldin Elhoweris

Biography
Ala Eldin Elhoweris is an aspiring nephrologist based in Glasgow, Scotland. Currently completing internal medical training prior to specialisation. He has held a renal clinical fellow position in Queen Elizabeth University Hospital where he developed his experience in renal medicine and began becoming involved in research at the unit. Ala Eldin is very passionate about pursuing further research in nephrology and continuing to expand his knowledge in the field.

Abstract

Introduction. Urinary tract infections (UTIs) can occur following kidney transplantation, but research on infection rates and outcomes is inconclusive. We therefore aimed to provide a comprehensive understanding of the natural history of UTIs and the impact on long-term outcomes.

Methods. We performed a single-centre cohort study of kidney-only transplant recipients at the Glasgow Transplant Unit, UK. A standardised protocol for UTI screening and treatment was in use and only treated UTIs were included. We studied the first two years post-transplant as this is the time when UTIs are most likely to occur. Patients were categorised into 3 groups based on number of UTIs: no UTIs, 1-2 UTIs and ≥3 UTIs. Furthermore, patients with highly recurrent UTIs defined as ≥10 UTIs in the first 2 years were compiled and analysed. Proportional odds logistic regression was performed to identify risk factors for having ≥3 UTIs, with adjustment for age, sex, primary renal diagnosis, donor type (live donor, deceased heart beating, deceased non-heart beating) and induction immunosuppression.

Results. Amongst 1412 transplant recipients studied over a nine-year period, the mean age was 48 years and 563 (39.9%) were female. 1169 (82.8%) of recipients experienced no UTIs, 180 (12.7%) had 1-2 UTIs, and 63 (4.5%) had ≥3 UTIs (Figure 1). The key risk factors for developing ≥3 UTIs were female sex: adjusted odds ratio (aOR) 1.50 (95% confidence interval 1.13-1.99), induction with anti-thymocyte globulin (ATG): aOR 6.60 (3.05-14.05), and age: aOR for each one-year increase 1.01 (1.00-1.02). There were no primary renal diagnoses (PRD) that demonstrated a significant association with ≥3 UTIs. However, individuals with tubulointerstitial disease, a group which includes structural abnormalities of the urinary tract and reflux nephropathy as a considerable proportion, showed a trend towards heightened risk: aOR 1.47 (0.97-2.22, reference group glomerulonephritis). Recipients with ≥3 UTIs had lower estimated glomerular filtration rates (eGFRs) at two years compared to the no UTI group (49.7 vs. 59.2mL/min/1.73m2, respectively). However, there was no significant increase in mortality or graft loss between the three groups. In the group of patients with highly recurrent UTIs, consisting of 14 patients (0.01%), we observed that 3 (21%) had a PRD of reflux nephropathy, while 5 (35%) had underlying

structural abnormalities of the native renal tract as a PRD. Further to this 5 (35%) of the patients received ATG induction and 5 (35%) patients had a previous transplant.

Discussion. We describe a low rate of UTIs requiring treatment in the first two years after kidney transplantation. Females, older recipients and those given ATG induction were at increased risk of recurrent UTIs. There was no impact of UTIs on graft loss or patient mortality. However, eGFR at two years post-transplant was lower amongst those with recurrent UTIs. We also observed that for the patients with highly recurrent UTIs, ATG
induction, previous transplants, reflux nephropathy and structural abnormalities of native renal tract may be a risk factor. Recipients at highest risk of UTIs should therefore be screened for UTIs and interventions to reduce this risk should be considered.

Figure 1. Event Plot: time to first treated UTI from kidney transplant. Shaded areas show 95% confidence interval
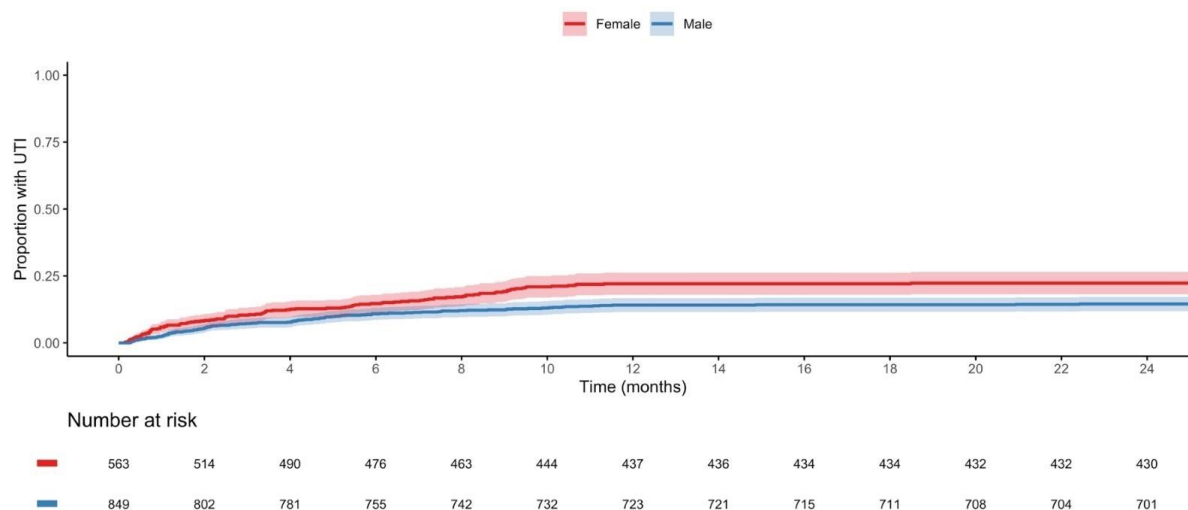
Poster number 346: WITHDRAWN

Poster number: 347

Submission number: 488

Clinical outcomes of a pre-dialysis cohort in a tertiary renal centre in the United Kingdom

Dr Hannah O'Keeffe, Dr Rosemary Donne, Prof Philip A. Kalra, Dr Ibrahim Ali

Salford Royal Hospital, Northern Care Alliance

Dr Hannah O'Keeffe

Biography
Dr Hannah O'Keeffe completed Nephrology and General Medicine Training in Ireland. She undertook a Clinical Innovation Fellowship with Innovate Health at Tallaght University Hospital from 2021-2023. In 2023 she started as a Clinical Research Fellow in Salford Royal Hospital and has commenced an MD with the University of Manchester.

Abstract

Introduction

Patients with advanced chronic kidney disease (CKD) require significant resources in order to manage the complications of CKD, and provide education and planning for renal replacement therapy (RRT). To better gauge the clinical trajectory of these patients, we aimed to provide a descriptive overview of patients who attended the multidisciplinary Advanced Kidney Care Service (AKCS) clinic over 8 years in a tertiary renal referral centre in the United Kingdom. Patients are typically referred to this clinic once their estimated glomerular filtration rate (eGFR) drops below 20ml/min/1.73m^2.

Methods

This was a retrospective study of consecutive patients who first attended the AKCS clinic in our centre between September 2011 and September 2018, and last follow-up was the end of September 2023. Patients with a prior renal transplant, with acute kidney injury with subsequent recovery of renal function, and those lost to follow-up were excluded. Patient details and outcomes were extracted from the hospital Electronic Patient Record including demographics, decisions regarding active or conservative management, timing of RRT initiation, first modality of RRT, transplantation, and mortality. The primary outcomes of interest included time to RRT, first modality of RRT, and death.

Results

A total of 1,957 patients were included. Of these 1,136 (58%) were male and 821 (42%) female. Median age was 69 years at the time of first AKCS review. A large proportion (80%) identified as white British,

13% as Asian or Asian British, 2% as Black or Black British, and the remaining as other ethnicities. Median eGFR was 16ml/min/1.73m^2 (IQR 4-25ml/min/1.73m^2) at first AKCS clinic.

A total of 1,087 patients (56%) initiated RRT during follow-up. The first modality was haemodialysis in 622 (57%), peritoneal dialysis in 298 (27%), and a renal transplant in 167 patients (15%). Median time to RRT commencement was 12.2 months (IQR 6.4-30). A further 240 patients received a transplant after dialysis. Of the 870 patients who did not initiate RRT, 350 (40%) were documented as opting for conservative management.

756 (38.6%) patients died either before RRT initiation (434) or on the conservative care pathway (322). A further 583 (29.8%) who commenced RRT died during follow up. Median time to death from first AKCS review was 38.5 months in the active management group (21.8 months in those who died without RRT and 51.0 months in those on RRT) compared to a median of 29.7 months in the conservative group.

Discussion

This study presents a descriptive analysis of long-term outcomes in a high-risk group of patients. Two-thirds of patients died within 5 years of their first AKCS review, demonstrating the high mortality burden in this population. Of those who died prior to RRT, 57.4% had opted for RRT or were undecided, highlighting the substantial competing risk of death prior to reaching end stage kidney disease.

We are planning further work with this dataset including risk prediction modelling. The ability to risk-stratify and profile patients, including consideration of co-morbidities and clinical frailty score, would be beneficial for patients and healthcare providers when making decisions regarding RRT and conservative care.

Poster number: 348

Submission number: 463

Is renal advice and guidance effective?

Dr Daniel Adlington, Dr Lucy Smyth, Dr Coralie Bingham

NHS, Exeter

Dr Daniel Adlington

Biography
I am a renal registrar training in the South West and currently working in Exeter. I have interests in acute kidney injury, peritoneal dialysis and global health.

Abstract

Introduction

Specialist Advice and Guidance enables GP's to seek advice from a specialist to guide and help inform the decision as to whether a referral to an outpatient service is needed. It is a key part of the Elective Recovery Plan and the NHS Operational Planning Guidance. We have provided a consultant-run advice and guidance service to GP's since 2018. We aimed to retrospectively review our renal advice and guidance service for 3 months focussing on rate of conversion to nephrology clinic attendance, selection of appropriate specialty and key themes or areas of uncertainty where advice has been required.

Methods

Nephrology advice and guidance requests and responses were retrospectively reviewed between October and December 2023 on the NHS e-referral service. We recorded baseline demographics, conversion to clinic attendance, if the patient was already known to the renal service and we then categorised the requests by: medication, imaging, acute kidney injury, chronic kidney disease, hypertension, anaemia and diabetes.

Results

During the 3-month period 143 advice and guidance requests were submitted. This averaged at 11 requests per week. The majority of requests were from GP's rather than other healthcare practitioners. 82/143 patients were male (57.3%). The average patient age was 67.4 years. The commonest reasons for advice and guidance request were general CKD advice (78/143 patients, 54.5%), medication advice (52/143, 36.4%) and questions relating to urinary tract imaging (29/143, 20.3%). We noted that 17/143 requests (11.8%) were queries related to the use of SGLT2 inhibitors which may represent a new area of uncertainty for prescribers. 22/143 (15.4%) requests were regarding patients already known to a renal consultant. Only 6/143 (4.2%) requests were redirected to another speciality. 22/143 (14.4%) requests were converted to formal referrals. Of these only 1 was deemed an urgent referral (a possible IgA vasculitis in a young adult).

Conclusion

We felt our advice and guidance service was being used appropriately. Less than 15% of requests were converted to clinic attendance which will help to maintain clinic capacity. We will review signposting to encourage direct communication between GP's and their named consultant for patients already receiving renal care. We will issue GP's with specific advice about the use of SGLT2 inhibitors in renal patients. Going forwards we plan to review how we better support GP's in the management of patients with early stage CKD who do not otherwise need routine nephrology follow up.

Poster number: 349

Submission number: 506

Investigation and management of pleural effusions in maintenance haemodialysis patients. A single centre retrospective study.

Dr Edward Alcorn[1], Dr Chad Pardoe[1], Dr Andrew Nixon[1], Dr Sharada Gudur[2]

[1]Renal Department, Preston. [2]Respiratory Department, Preston

Dr Edward Alcorn

Biography
Renal Senior Clinical Fellow Starting ST4 Renal Medicine Training in Feb 2024

Abstract

Introduction

Pleural effusions are a common and often complex squelea in end stage renal failure patients with a varied range of differential causes. They are often difficult to manage with patients commonly undergoing multiple invasive procedures as part of a diagnostic and management strategy and can have significant morbidity. Despite this when undertaking a literature search whilst there are some studies investigating the incidence and cause of pleural effusions in chronic kidney disease patients[(1,2)], there is very little evidence and consensus on how to manage pleural effusions in haemodialysis dependant patients. Within our own renal unit there has historical been a wide discrepancy in how these patients have been managed. There have been patients have been managed conservatively, patients who have had multiple invasive interventions, through to at least one patient who had an indwelling pleural catheter inserted.

Method

We are firstly undertaking a retrospective study to better understand the incidence in our regional renal centre. Patients were identified from known dialysis patients by searching through electronic hospital records for a pleural effusion diagnosis. This was supplemented by searching pleural pathology results in those with a EGFR of less than 15 before eliminating those who weren't maintenance haemodialysis patients. Data was then collected from medical notes including aetiology of effusion, investigations, interventions and outcomes of pleural effusions in haemodialysis patients. Data analysis will be undertaken to establish if there is any significant difference in outcomes when different management approaches are used.

Results

Our study is still ongoing however initial results show that effusions are difficult to manage with most patients undergoing multiple interventions and many having multiple hospital admissions. Most patients undergo a combination of invasive interventions as well as conservative managements such as

increasing ultrafiltration targets on dialysis. However a large proportion of those with pleural effusions who undergo invasive interventions undergo multiple procedures. Several patients experienced parapneumonic effusions and empyema post interventions.

Discussion

Pleural effusions have been shown in previous studies and in our initial results to be a common issue in haemodialysis patients. Our initial research shows that they can be difficult to manage with complications of interventions such as recurrent hospital admissions and infections. Our ultimate goal would be to standardise the approach to diagnose and manage pleural effusions in end stage renal failure patients. We believe our ongoing research study will be important in determining how best to investigate and manage pleural effusions in these patients.

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Poster number: 350

Submission number: 511

Investigating the association of chronic obstructive pulmonary disease with outcomes in patients with non-dialysis dependent chronic kidney disease

Dr Lino Merlino[1,2], Dr Francesco Rainone[1], Dr Rajkumar Chinnadurai[1], Dr Graziana Battini[2], Dr Paolo Colombo[2], Dr Marco Trivelli[3], Prof. Philip A. Kalra[1]

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Dr Lino Merlino

Biography
Senior Research Clinical Fellow at Salford Care Organisation PhD Student at Manchester University

Abstract

Introduction:

Kidneys and lungs have a strong pathophysiological link. However, studies on the association between chronic conditions involving these two organs, chronic kidney disease (CKD) and chronic obstructive pulmonary disease (COPD) are limited. Nephrologists better understand the pathophysiology and management of acute manifestations of these two organs, i.e., pulmonary-renal syndrome accompanying vasculitis, compared to their chronic alterations.

Our study aims to investigate the prevalence and association of COPD with adverse outcomes in patients with CKD (stages 3-5).

Methods:

This retrospective observational cohort study was conducted on CKD patients (stages 3-5) enrolled in the Global Collaborative Network (GCN) of the TriNetX research platform between the years 2003 and 2023. TriNetX provides access to anonymized electronic medical records across large healthcare organizations (HCOs). This report includes patients from 112 HCOs with different demographic backgrounds. The study compared outcomes of patients aged 18-80, with and without COPD, in a propensity score-matched (PSM) cohort of CKD patients. The characteristics included in the PSM were age, sex, ethnicity, comorbidities (neurological, hematological, cardiovascular, gastroenterological and endocrine conditions) and baseline serum creatinine. The proportional hazard assumption was tested using the generalized Schoenfeld approach built in the TriNetX platform. A 95% confidence interval (95% CI) was considered evidence of statistical significance throughout the analyses. The Kaplan- Meier (KM) method was used for the survival probability. Statistical significance was defined as p-value < 0.05. Outcome events were included 180 days after the index event (COPD diagnosis) and ended 3650 days after.

Results:

Of the total of 1,045,536 CKD patients, 181,207 had a co-existent diagnosis of COPD (prevalence rate- 17.3%). A PSM generated a matched cohort of 174,308 patients each. The mean age of the cohort was 66.7 +/- 7.9 years, with a predominance of white ethnicity (65.8%) and an equal male-to-female ratio. 73.1%, 51.5%, 69.6%, 54.1%, and 37.2% had a history of cardiovascular, nervous system, endocrine, gastroenterological and haematological disease, respectively. The mean serum creatine at baseline was 1.3 +/-1.2 mg/dL. The comparison of differences in the outcomes on follow-up between the matched cohorts is illustrated in Table 1. CKD patients with concomitant COPD had a higher all-cause mortality (17.3% vs 8.7%, p<0.0001), higher all-cause hospitalisations (14.7% vs 12.7%, p<0.0001), and higher cardiovascular events. Proportional hazard models showed that COPD is a strong risk factor associated with all-cause mortality (HR: 2.189; 95% CI (2.13-2.22, p<0.0001)), hospitalisations (HR:1.39; 95% CI (1.36 – 1.44); p<0.0001), and other p<0.001) (Figure 1).

Discussion: Our 'real-world data' findings emphasize that patients with CKD and COPD are a cluster that requires special attention due to poorer outcomes. Given the high frequency of these associations betweent hese two chronic conditions, an improved awareness is warranted among the nephrological community.

Table 1 Risk difference and Hazard Ratio between the groups with and without COPD in a matched analysis

Outcomes	Risk difference		HR (95%CI)
	With COPD	**Without COPD**	
All-cause mortality	26,980 (17.3%)	14,437 (8.7%) **	2.18 (2.13– 2.22)
All-cause hospitalization	8,655 (14.7%)	10,571 (12.7%) **	1.39 (1.36 – 1.44)
Acute myocardial infarction	7449 (5.2%)	4532 (2.9%) **	2.08 (2.01 – 2.16)
Cerebrovascular accident	5,511 (3.6%)	4,244 (2.7%) **	1.54 (1.48 – 1.61)
Transitory ischemic attack	446 (0.26%)	391 (0.23%) *	1.30 (1.13 – 1.49)
Sepsis	9,713 (5.5%)	5,291 (3.3%) **	2.29 (2.21 – 2.36)
Anemia	14,199 (13.6%)	11,518 (9.9%) **	1.61 (1.57 – 1.65)
Pulmonary embolism	2,857 (1.75%)	1,628 (0.97%) **	2.06 (1.94 – 2.19)
Deep venous thrombosis	2,437 (1.5%)	1,777 (1.1%) **	1.59 (1.49 – 1.69)
Cognitive impairment	8,054 (4.6%)	6,869 (3.9%) **	1.32 (1.27 -1.36)
Anxiety disorders	32,055 (18%)	26,739 (15.3%) **	1.37 (1.34 – 1.39)
Depression	8,485 (7.78%)	6,548 (5.5%) **	1.65 (1.63 – 1.71)
Post-traumatic stress disorder	1,613 (0,9%)	1,196 (0.7%) **	1.53 (1.42 – 1.65)
Sleep disorders	45,050 (25.8%)	33,756 (19,3%) **	1.61 (1.59 – 1.64)
Antidepressants use	9,978 (11.1%)	9,645 (9.5%) **	1.39 (1.35 – 1.43)

**p-Value <0.00001   *p-Value <0.05

Figure-1

Kaplan-Meier Survival Curve
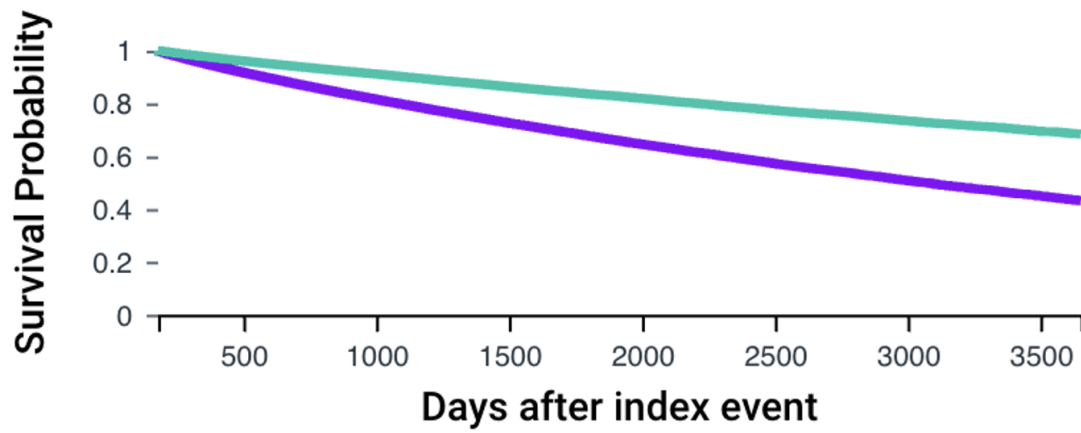
Green line: CKD patients
Purple line: CKD + COPD patients

Poster number: 351

Submission number: 399

Long-term health outcomes in non-dialysis dependent chronic kidney disease patients with cognitive impairment or dementia.

Dr Lino Merlino[1,2], Dr Francesco Rainone[1], Dr Rajkumar Chinnadurai[1], Dr Graziana Battini[3], Dr Paolo Colombo[2], Dr Marco Trivelli[4], Dr Ross Dunne[5], Prof Philip A. Kalra[1]

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Dr Lino Merlino

Biography
Senior Research Clinical Fellow at Salford Care Organisation PhD Student at Manchester University

Abstract

Introduction: A decline in cognitive function, with a spectrum ranging from mild cognitive impairment to dementia (CI-D), is common in patients with chronic kidney diseases (CKD), rendering them frailer. Whether the coexistence of CKD and CI-D increases the health risk profile remains unclear. Our work aims to clarify how this association increases adverse outcomes for CKD patients (stages 3-5).

Methods: This retrospective observational cohort study was conducted on CKD patients (stages 3-5) from the Global Collaborative Network (GCN) of the TriNetX research platform between 2004 and 2024. TriNetX provides access to anonymized electronic medical records from over half a million CKD patients in large healthcare organizations (HCOs) across the world.

Our report includes patients from 110 HCOs with different demographic backgrounds. The study compared outcomes of patients with CKD stages 3-5, aged 18-70 years, with and without pre-existent CI-D (diagnosed within 5 years). The two cohorts were propensity score-matched (PSM) for age, sex, ethnicity, comorbidities (neurological, haematological, musculoskeletal, respiratory including smoking history, oncological, cardiovascular, gastroenterological and endocrine conditions) and CKD stage.

The proportional hazard assumption was tested using the generalized Schoenfeld approach built in the TriNetX platform. A 95% confidence interval (95% CI) was considered evidence of statistical significance throughout the analyses. Kaplan- Meier (KM) was used for survival probability. Statistical significance was defined as p-value < 0.05. Outcome events were included from 1 day after the index event (CKD diagnosis) until 3650 days after.

Results: Of the total of 503,298 CKD patients, 7,891 had a co-existent diagnosis of CI-D made within 5 years (prevalence rate 1.56%). A PSM generated a matched cohort of 7,890 patients each. The mean age of the cohort was 60.7 +/- 7.0 years, with a predominance of white ethnicity (53.7%) and an equal male-to-female ratio.

Standardized difference (Std diff) was used to evaluate the balance of baseline characteristics in the PSM populations. Generally, Std diff < 0.1 is considered a small difference and all comorbidities fell below this threshold after PSM (table 1).

The comparison of the outcomes at follow-up between the matched cohorts is illustrated in Table 2.

CKD patients with concomitant CI-D had higher all-cause mortality (18.4% vs 12.1%, p<0.0001), a higher risk of cerebrovascular disease (10.8% vs 7.8%), malnutrition (6.7% vs 4.3%), mood disorders (13.7% vs 8.9%), anxiety (13.2% vs 10.9%), encephalopathy (9.6% vs 4.5%), epilepsy (4.3% vs 1.3%). All findings were statistically significant with a p<0.0001.

Proportional hazard models showed that CI-D was a strong risk factor associated with all-cause mortality (HR: 1.761; 95% CI (1.621-1.913, p<0.0001)) and other cerebrovascular and mental health illnesses. KM chart illustrates the differences in survival probability between the two groups (Log-Rank p<0.001) (Figure 1).

Discussion: Our "real-world data" demonstrate that a concomitant CI-D diagnosis is a strong risk factor for negative health outcomes and mortality in patients with CKD stages 3-5. These results highlight the need for routine cognitive assessments in patients with advanced CKD to deliver personalised care.

Table 1:

Cohort: 1 CKD and CI-D

Cohort 2: CKD alone

Diagnosis after Propensity Score Matching						
Cohort			Patients	% of Cohort	P-Value	Std diff.
1 2	E00-E89	Endocrine, nutritional and metabolic diseases	6,174 6,099	78.3% 77.3%	0.151	0.023
1 2	I00-I99	Diseases of the circulatory system	6,244 6,195	79.1% 78.5%	0.340	0.015
1 2	N00-N99	Diseases of the genitourinary system	5,215 5,186	66.1% 65.7%	0.626	0.008
1 2	M00-M99	Diseases of the musculoskeletal system and connective tissue	4,972 5,019	63.0% 63.6%	0.438	0.012
1 2	K00-K95	Diseases of the digestive system	4,645 4,638	58.9% 58.8%	0.910	0.002
1 2	J00-J99	Diseases of the respiratory system	4,147 4,153	52.6% 52.6%	0.924	0.002
1 2	D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	3,585 3,604	45.4% 45.7%	0.761	0.005
1 2	C00-D49	Neoplasms	2,183 2,145	27.7% 27.2%	0.498	0.011
1 2	F17	Nicotine dependence	1,755 1,699	22.2% 21.5%	0.281	0.017

Table 2- Incidence of outcomes, including relevant medication use, among CKD and CI-D patients compared to CKD alone (after PSM)

Outcome	CKD+CI-D	CKD	Hazard ratio (95%CI)
Deceased	1,417 (18.4%)	934 (12.1%)	1.761 (1.621-1.913)*
Ischemic heart disease	531 (11.3%)	631 (12.0%)	1.070 (0.953-1.01)
Cerebrovascular events	491 (10.8%)	511 (7.8%)	1.659 (1.465-1.878)*
Malnutrition	447 (6.7%)	315 (4.3%)	1.773 (1.535-2.049)*
Type 2 Diabetes	289 (8.5%)	391 (10.2%)	0.905 (0.777-1.054)
Acute Kidney Injury	677 (19.5%)	754 (16.6%)	1.329 (1.197-1.474)*
Psychiatric complication			
Mood disorders	467 (13.7%)	476 (8.9%)	1.944 (1.710-2.209)*
Anxiety	572 (13.2%)	596 (10.9%)	1.499 (1.336-1.682)*
Alcohol abuse	104 (1.5%)	101 (1.4%)	1.208 (0.919-1.590)
Neurological complication			
Encephalopathy	567 (9.6%)	330 (4.5%)	2.425 (2.117-2.778)*
Epilepsy	282 (4.3%)	100 (1.3%)	3.859 (3.071-4.850)*
Sleep disorders	551 (11.7%)	652 (12.4%)	1.150 (1.027-1.288)*
Psychotropic medication			
Antidepressants	877 (25.3%)	689 (14.1%)	2.286 (2.068-2.527)*
Anticonvulsants	759 (18.4%)	809 (15.4%)	1.426 (1.292-1.575)*
Antipsychotics	952 (18.3%)	559 (8.2%)	2.640 (2.378-2.932)*

Kaplan-Meier Survival Curve
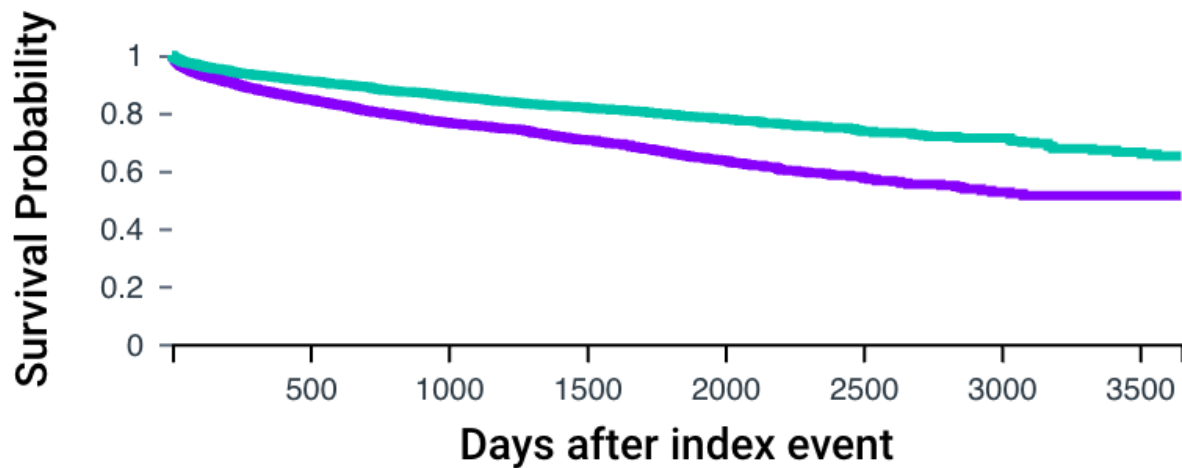
Green: CKD cohort

Purple: CKD and CI-D cohort

Use of renin-angiotensin-system inhibitors for chronic kidney disease in secondary care - a single unit retrospective study

Dr Muhammad Naveed Khawaja, A Hewins, Kirsty Swinscoe, Dr Zoe Pittman, Dr Khai ping NG

NHS, Derby Easy Midlands

Dr Muhammad Naveed Khawaja

Biography
Trainee Registrar with vast international experience in Renal medicine and specialist interest in transplant and CKD population

Abstract

Introduction:

Chronic kidney disease (CKD) is a prevalent condition associated with high cardiovascular burden and premature death. Renin-angiotensin-system inhibitors (RASi) represents the cornerstone therapy in CKD with NICE recommendation to optimise its use prior to introduction of SGLT2 inhibitors in albuminuric CKD and finerenone in diabetic nephropathy. We aimed to examine the prevalence of RASi prescription and explore barriers to its use in a secondary care CKD population.

Methods:

A retrospective observational study of all patients under the care of general nephrology clinics in a single renal unit with available eGFR and uACR results in 2022. Baseline demographics, clinical diagnosis, laboratory parameters and medications were retrieved via local electronic renal database (VitalData). Data was analysed using SPSS v27.

Results:

In total, 1762 patients were included in the study: mean age of 64 (SD: 18)years, 55% were male , diabetic nephropathy (17%) as the most common primary renal diagnosis, mean clinic blood pressure of 144 (SD:44)/77 SD:12) mmHg, mean eGFR of 48 (SD:26)ml/min/1.73m^2, median uACR of 51 (IQR:110)mg/mmol and 36% had 5-year KFRE>5%. Overall, 56% (n=980) were on RAASi whilst 12% (n=209) on SGLT2i.

Of those not prescribed RASi (n=718), 11% had diabetes, 2% had heart failure and 1% had cardiovascular disease. Their mean eGFR was 49 (SD:28)ml/min/1.73m^2, 28% had eGFR< 30ml/min/1.73m^2, median uACR 6.1 (IQR:27.8)mg/mmol, 32% had 5-year KFRE >5%, 10% had diabetes with uACR >3mg/mmol whilst 8% were non-diabetic with uACR> 70 mg/mmol. 8% were on dapagliflozin, of which 1.9% had diagnosis of diabetes.

Amongst those not on RASi, 8% (n=60) were previously prescribed RASi but stopped, 1% (n=9) had documented intolerance or acute kidney injury associated with RASi whilst 0.1% (n=1) had documented hyperkalaemia. Regarding last measured serum K$^+$, the majority (84%) were below 5mmol/L and only minority (4.3%) were above 5.5mmol/L. Regarding last clinic blood pressure, majority (84%) were ≥120 mmHg whilst only 2.2% were <100mmHg.

Overall, 54% (n=388) had serum K$^+$<5mmol/L with clinic SBP>120mmHg and no documented contraindication of RASi. The majority (n=295) had eGFR >30ml/min, of these, 154 patients had uACR >3mg/mmol and 50 have eGFR>30ml/min with uACR >30mg/mmol.

Comparing with patients on RASi and those not on RASi, there was no statistical difference in their age (p=0.7) or eGFR (p=0.22). However, there is higher prevalence of diabetes (20% vs 15%, p=0.003), higher clinic blood pressure (p=0.015) and higher uACR (p<0.001) and greater prescription of statin (p<0.001) as well as SGLT2i (p<0.001) amongst patients on RASi compared to those not on RASi.

CONCLUSION

Even in a secondary care renal clinic there are barriers to initiation and continuation of RASi therapy. There are likely to be multiple reasons contributing to this including patient factors. However, this limited dataset is reassuring in showing that the majority of high risk patients in the cohort are on appropriate RASi therapy but there remains a significant proportion of patients who do not have a clear reason for not being on RASi but meet high risk criteria. More needs to be done to investigate systemic barriers to optimal care.

Poster number: 353

Submission number: 545

Intravenous iron requirements for non-dialysis CKD patients selecting ESA versus HIF-PH inhibitors for the treatment of renal anaemia

Dr Stephen Proctor

Renal Unit, Nottingham

Dr Stephen Proctor

Biography
Specialty Registrar, Renal Medicine

Abstract

Introduction

Treatment for renal anaemia includes supplemental iron, erythropoietin stimulating agents (ESA), hypoxia inducible factor prolyl hydroxylase inhibitors (HIF-PHi) and blood transfusion. Data from phase 3 clinical trials reported a greater reduction in circulating hepcidin in patients receiving HIF-PHi than ESA, and an approximate 50% reduction in frequency and dose of intravenous iron required for non-dialysis patients receiving roxadustat over darbepoietin. This may have a significant impact on anaemia service provision and patient experience if replicated in real-world experience.

Methods

Data were retrospectively obtained from non-dialysis dependent patients initiated on treatment with ESA or HIF-PHi between November 2022 and April 2023 inclusive at our centre. Indications for dose adjustments, target haemoglobin and requirement for supplemental iron were identical in both groups. Choice of treatment was patient-led following counselling. Baseline demographic and laboratory parameters were collected from the time of initiation. Total intravenous iron requirement and number of iron infusions were recorded from time of initiation until 6 months later. Renal transplant recipients were excluded. Data were compared between ESA and HIF-PHi recipients with Fisher's Exact Test for categorical variables and t-test for continuous variables. Data are presented as mean±SD or as n(%) as appropriate.

Results

Twenty two patients commenced darbepoietin and twenty three roxadustat within the timescale. Baseline demographic and laboratory data are shown in table 1.

	Darbepoietin	Roxadustat
Number of patients	22	23
Age	64.8±13.8	74.7±17.5
Male gender	16 (73%)	16 (70%)
White Ethnicity	18 (82%)	21 (91%)
Deprivation index Decile	5.3±3.0	5.2±3.4
Hb (g/l)	85±10.1	88.6±6.9
Ferritin (microg/l)	558±265	486.4±510
TSAT (%)	25.2±14	30.7±20.9
eGFR (ml/min/1.73m^2)	16±6.2	16±6.6
Oral iron prescription	9 (41%)	4 (17%)

Table 1 Baseline Characteristics. Hb, haemoglobin; TSAT, transferrin saturation; eGFR, estimated glomerular filtration rate

Of the ESA recipients, 18% patients progressed to end stage renal disease (ESRD) compared to 9% in the HIF-PHi group. Fewer patients in the HIF-PHi group were prescribed iron tablets (17.4 vs 40.9%). Two patients in each group required packed red cell transfusions. The mean number of inflammatory events, defined as a CRP >50 were higher in the ESA group (0.77 vs 0.26). Completion of 6 months' treatment was higher in the ESA group (90.9% vs 74%). The most common reason for discontinuing treatment was intolerance.

Mean intravenous iron dose received by ESA recipients was 613 ± 406 mg and 522 ± 412 mg for HIF-PHi recipients (p=0.46). No significant difference in intravenous iron dose between the two groups was identified after excluding 8 patients who did not complete 6 months of selected treatment (ESA 600 ± 417 mg vs HIF-PHi 647 ± 386 mg(p = 0.46)). Number of doses required was 1.2 ± 0.8 for ESA recipients and 1.0 ± 0.8 for HIF-PHi recipients (p = 0.73). The proportion of patients receiving IV iron was (81.8%) for ESA recipients and (74%) for HIF-PHi recipients (p=0.72).

Discussion

Over a 6 month period of treatment in a non-clinical trial real-world setting, there was not a significant difference in intravenous iron requirement between non-dialysis patients receiving ESA or HIF-PHi for renal anaemia.

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Poster number: 354

Submission number: 617

Association and progression of multi-morbidity with Chronic Kidney Disease stage 3a secondary to Type 2 Diabetes Mellitus, grouped by albuminuria status in Northwest London

Dr Rakesh Dattani[1], Mr Zia Ul-Haq[2], Mr Moulseh Shah[3], Dr gabrielle Goldett[4], Professor the Lord Ara Darzi[1], Professor Hutan Ashrafian[5], Dr Tahereh Kamalati[6], Dr Andrew Frankel[4], Professor Frederick Tam[7]

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Dr Rakesh Dattani

Biography
Dr Rakesh Dattani is a clinical research fellow at Imperial College London with a specialist interest in the early detection of Chronic Kidney disease and improving outcomes for individuals with CKD.

Abstract

Objectives - To determine the association between CKD stage 3a and varying degrees of albuminuria with multimorbidity and CKD progression as well the most recent prescribing practice of prognostically beneficial medication within the study cohort.

Design – Retrospective cohort study.

Setting: We utilised the Discover dataset consisting of 2.3 million patients from Northwest London, with linked data from primary, secondary, and social care services available from 2015 onwards.

Outcome measures: Baseline and 5 year co-morbidity was determined to 31st December 2021, as were prescribing practices with regards to prognostically beneficial medication.

Results - 1082 patients met the study inclusion criteria. 224 patients were identified to have CKD3aA1, 154 CKD3aA2 and 93 CKD3aA3. 611 of 1082 patients with CKD3a, did not have a uACR available between January-December 2015. Diabetic retinopathy, hypertension, and Ischaemic Heart Disease (IHD) were the three most common co-morbidities, with no statistically significant difference in the degree of co-morbidities at baseline between CKD3aA1 Vs CKD3aA2/A3 and CKD3aV2 Vs CKD3aA3. A statistically significant difference in the degree of hypertension, retinopathy, IHD and vascular disease from baseline compared to study end point was observed for all 3 study groups. Comparing co-morbidities developed at study end point, highlighted a statistical difference between CKD3aA1 Vs CKD3aA3 for retinopathy alone and for hypertension and heart failure between CKD3aA2 Vs CKD3aA3. Of all patients with CKD3aA2 or CKD3aA3, only 40.8% of patients were prescribed RAASi therapy between June-December

2021. Progression analysis showed CKD3aA1 and CKD3aA2 to be associated with a low degree of progression to CKD 4 or CKD5, with 14% of patients with CKD3aA3, however, developing CKD stage 5 within 5 years of diagnosis with CKD.

Conclusion: DKD is associated with significant multimorbidity, with macro-albuminuria at diagnosis linked with a higher burden of disease at 5 years post diagnosis. Ensuring assessment of both uACR and eGFR in those at risk of CKD including patients with T2DM, will allow for patients to be appropriately stratified according to future risk as well as ensuring early diagnosis and management with prognostically beneficial medications and thus delaying/preventing progression of associated morbidity and mortality.

Poster number: 355

Submission number: 572

CKD Discovery in Greater Manchester: Mapping the CKD journey, providing insights into the reimagining of the CKD pathway.

Dr James Tollitt[1,2], Mrs Laura Rooney[3], Mrs Lekshmy Parameswaran[4], Mrs Catherine Douglas[5], Dr Anu Jayanti[6]

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Dr James Tollitt

Biography

Dr James Tollitt graduated in medicine from University of Manchester in 2008. He became a member of the Royal College of Physicians (Edinburgh) in 2011 and commenced specialist nephrology training in 2012 and joined the specialist register for nephrology in 2020. Dr Tollitt successfully completed a postgraduate diploma in medical education from the University of Manchester. Dr Tollitt completed his PhD on the interaction between stroke, cognition, and renal disease in 2020. He was appointed as a Consultant Nephrologist at Salford Royal NHS Trust in February 2020. He is leading on the national transplant first QI project for Salford and has extensive experience in both QI and research. His research interests include CKD, AKI, cognition, stroke and CKD. He is passionate about trying to address healthcare inequalities in the UK and reducing variability in CKD care in particular.

Abstract

Introduction

Greater than 10% of our population live with CKD, with 132,000 people suffering more advanced kidney disease (CKD stages 3-5) in Greater Manchester (GM) (1). The presence of CKD independently increases morbidity and mortality risk. Data from the CVD prevent audit (2) identified significant unwarranted variation in identification of patients with CKD, in coding and in treatment to guidance particularly in socially deprived areas in GM. UK renal registry (3) indicate that 18% of patients that require renal replacement therapy are referred late to secondary care i.e. < 3 months before the start of dialysis.

CKD discovery is a collaborative project between Health Innovation Manchester, Boehringer Ingelheim, GM system partners and The Care Lab. The key objectives for the discovery project are to:

1. Map current CKD pathways across GM, including service provision, activity, waiting lists, outcomes, and cost, while also identifying areas of best practice.
2. Provide greater insight on patient demographics and the patient journey and experience through user-journey mapping, engagement, and pathway analysis.

3. Identify gaps and opportunities for improving integration, outcomes, and the experiences of patients and professionals, including the potential for therapeutic and non-therapeutic solutions to add value and improve efficiency and effectiveness.

Methods

Each stakeholder will contribute their expertise and lived experience via seven group sessions in January 2024, including 2 patient and carer group sessions. Through group sessions and 'lived experiences' we aim to understand the key issues and needs of our stakeholders. This will identify key lines of enquiry which we believe are opportunities to reduce inefficiencies along the healthcare journey. The mapping process will be conducted by Boehringer Ingelheim health design partners, The Care Lab, who have a wealth of creative tools and techniques to enable people to engage and co-create current and future desired experience journeys. They are experts at visualizing knowledge and ideas to form a collective understanding of the present and formulate an aligned vision of the future.

A second round of multidisciplinary group sessions will occur in March 2024. These will leverage the key learnings and insights around todays challenges, to co-create a set of strategic opportunities and improved care pathway scenarios.

Results

The CKD discovery work has created a workshop toolkit to support and aid engagement to unpack and more deeply and holistically understand the clinical challenge. Figure 1 is an example of one of these. All group sessions will have been completed by March 2024 and be reported on by April 2024.

Conclusion

The CKD discovery work will highlight areas for possible improvement and make recommendations to the GM CKD clinical and commissioning community about what transformation of the pathway could mean in terms of future benefits to patients and the GM system at large. It will underpin local and system wide changes which can be tested and piloted within the second phase of this project: Re-imagining the CKD pathway in Greater Manchester.

Greater Manchester Infrastructure Map

This Local infrastructures map has been produced as part of a Collaborative Working partnership between Health Innovation Manchester and Boehringer Ingelheim Ltd.

% of patients with a **Chronic kidney disease** (CKD) **Diagnosis** falling within '**Most Deprived**' 0-30% Overall IMD Score, National ICS Level, 2022-2023

CKD rate per 1,000 population

Uncoded CKD rate per 1,000 population

Location with the **highest** and location with the **lowest** CKD mortality levels in Greater Manchester

90.6

56.3

Trafford
Highest CKD mortality levels

Salford
Lowest CKD mortality levels

GENERAL HOSPITAL
TERTIARY CENTRES

TRUSTS

- Northern Care Alliance
- Tameside and Glossop Integrated Care
- Stockport National Health System (NHS) Foundation Trust (FT)
- Manchester University NHS FT
- Wrightington, Wigan and Leigh NHS FT
- Royal Bolton NHS FT

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Poster number: 356

Submission number: 585

The Development of a Multi-Disciplinary Community Nephrology Service

Dr Huda Mahmoud, Nicole Mayisva, Sally Killian, Jo Edwards, Christine Steen, Majeed Khan, Dr Simon Harlin, Dr Matthew Dodd

Walsall Healthcare NHS Trust, Walsall

Dr Huda Mahmoud

Biography
Community nephrologist and general internal Physician. MBChB, PhD, FRCP.

Abstract

Typically, chronic kidney disease (CKD) is managed in primary care with more advance disease requiring specialist management in secondary care. However, mortality due to CKD has continued to rise by a third in the past decade and is predicted to continue to rise, showing a clear need for an adapted and unified approach to the optimal management of CKD.

We present the implementation of a number of service development projects, delivered in the Walsall region by a multi-disciplinary team (MDT), comprising of primary and secondary care specialists. The MDT approach aims to optimize patients' nephrology outcomes, patient satisfaction, provide holistic care as well as facilitate increased supervision in primary care.

The team is versatile and provides a variety of services; firstly, the community nephrology MDT. This provides a platform for acute consults for acute nephrological issues in the community and has input from a nephrologist, pharmacist, community CKD nurse. The community nephrology MDT is a more readily accessible and dialogical referral method than the standard advice and guidance referrals in primary care. Referrals are also welcomed from general practitioners and other community specialist services such as the community frailty or heart failure teams. Another key role provided by the community nephrology MDT includes the long-term monitoring, therapy optimisation, managing secondary complications of CKD in frail, housebound individuals. Domiciliary outreach visits are often required for this cohort in whom hospitalization should be avoided. Moreover, the pharmacists play a unique and invaluable role in the MDT, taking the lead on medicine reconciliation and are now responsible for overseeing the management of renal anaemia in the community; prescribing, monitoring, and adjusting Roxadustat.

The community CKD nurse directly manages approximately 50 patients under the conservative care pathway. Using a combination of telephone consultations and home visits to manage symptoms and avoiding hospital attendances and admissions.

Another provision of the service development is increased population surveillance; currently conducting a pilot with primary care surgery. Databases are screened by nephrologists in conjunction with primary care leads to facilitate more timely identification and management of CKD.

Currently, approximately three hundred patients are under the care of this team. Through patient survey feedback, service users have reported increased appreciation for a reduction in outpatient attendances as well as more accessible support. >90% of those under the conservative care pathway have agreed that their care has been streamlined.

Service development through the means above are promising interventions that can improve the management CKD, potentially reducing mortality and morbidity. Furthermore, streamlining the patient experience, while easing burden on both primary and secondary care. Preliminary patient experience has been positive and primary care colleagues have also praised easier accessibility to specialist input. This service has been able to almost immediately meet a need and demonstrated effective co-operation between primary and secondary care; there remains more room yet for further strategies using this approach within nephology and wider adult medicine alike.

Poster number: 357

Submission number: 607

RELEVELLING-CKD1: Screening and coding practices for people with clinical risk factor(s) for Chronic Kidney Disease in NorthWest London : a 11 year longitudinal cohort study.

Dr Rakesh Dattani[1], Mr Zia Ul-Haq[2], Dr Benjamin Pierce[3], Dr Esther Kwong[4,5], Ms Livi Bickford-smith[6], Ms Sophie Walker[6], Mr Matthew Wyatt[7], Mr Andrew Freeman[8], Dr Eleanor Sandhu[9], Dr Tom Cairns[9], Dr James Tomlinson[9], Dr Darren Parsons[9], Dr Marie Condon[9], Ms Joana Teles[9], Dr Tahereh Kamalati[3], Dr Neville Purssell[10], dr raakhee desilva[11], Dr Andrew Frankel[9], Professor Frederick Tam[12]

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Dr Rakesh Dattani

Biography
Dr Rakesh Dattani is a clinical research fellow at Imperial College London with a specialist interest in the early detection of Chronic Kidney disease and improving outcomes for individuals with CKD.

Abstract

Introduction:

The prevalence of Chronic Kidney Disease (CKD) is increasing, with up to 15% of the worldwide population affected. Appropriate screening of people with clinical risk factors for CKD is thus essential to allow for the early identification of CKD and its subsequent management aimed at delaying/preventing advanced CKD and morbidity. We thus utilised the Discover London SDE dataset, to determine the screening and coding practices for people with clinical risk factor(s) for CKD between 1/1/2011-31/12/2021.

Method:

Adults with a clinical risk factor for CKD prior to 1/1/2010, were identified. Annual screening and coding practices from 2010 to 2021 were assessed. Individuals were deemed to be fully screened if an estimated Glomerular Function Rate (eGFR) was performed with a urine dipstick test and an urine Albumin Creatinine Ratio (uACR), and partially screened if 1 or 2 of the required tests performed. Those subsequently diagnosed with CKD were assessed to determine coding practices within Electronic Health Records(EHR's).

Results:

277,711 (26%) unique individuals without CKD had at least one traditional clinical risk factor for CKD. Hypertension (50.51%), Non-Diabetic Hyperglycemia (34.11%), ischemic heart disease (14.10%) and Type 2 Diabetes (9.26%) were the commonest clinical risk factors identified. 58.86% did not undergo screening for CKD in 2010 either partially or fully with 0.16% fully screened in 2010. The highest proportion for any combination of screenings was eGFR alone (32.29%). Amongst the 114,248 individuals either fully or partially screened in 2010, 20,454 (17.9%) had CKD, amongst which 1391 (6.8%) were coded for CKD in 2010. Longitudinal follow up of the 277,711 individuals, showed up to 0.12% of individuals per year without coded CKD to have been fully screened for CKD. Those partially screened ranged between 34-42%. Overall, between 2010 and 2021, 5.3% of the total cohort were coded for CKD, with on average a further 6.7% of individuals having results indicative of CKD per year representing at least 22,549 unique individuals by 31st December 2021 with uncoded CKD.

Discussion:

Screening and coding practices for CKD remain poor through the study period, with almost two thirds of the study cohort per year, not being either partially or fully screened. A high proportion had CKD, with many not formally coded within EHR, with potential implications including a lack of patient awareness/engagement to potential inadequate prescribing of prognostically beneficial medication and monitoring of individuals at risk of advanced CKD. To improve the screening and coding of CKD, we recommend for CKD to be included as a screening programme recommended by the UK National Screening Committee and an indicator within the Quality Outcome Framework. This will ensure CKD screening is performed in high-risk populations, allowing for earlier identification and optimal management.

Conclusion:

Screening and coding practices for CKD in NWL remained inadequate over the last decade. The inclusion of CKD as a screening programme within the UK NSC and as an indicator within the QOF, has the potential to aid earlier diagnosis and facilitate the utilisation of prognostically beneficial medication to help prevent or delay advanced CKD and associated multimorbidity and mortality.

Poster number: 358

Submission number: 549

Prevalence and associations of impaired cognitive function among people with chronic kidney disease: baseline findings from the NURTuRE-CKD cohort study

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Dr Keegan Lee

Biography
Keegan Lee is a specialty trainee in renal medicine, who is pursuing a post-graduate research degree at the University of Southampton. His research is focussed on chronic kidney disease and cognitive function. He has also helped to deliver renal research in Wessex as the Clinical Research Network Renal Fellow.

Abstract

Introduction

Chronic kidney disease (CKD) is known to be associated with impaired cognitive function, with lower estimated glomerular filtration rate (eGFR) associated with poorer cognitive performance.[1,2] Though CKD prevalence increases with age, the association with cognitive disorders is not entirely explained by age distribution.[3] Cognitive impairment in CKD is multifactorial with potential biochemical, cardiovascular, medication and socio-economic mediators.[3,4] As with other long-term conditions, self-management of kidney disease becomes more difficult in the context of cognitive impairment.[5] The prevalence and associations of cognitive impairment in people referred to secondary care with CKD is not well described. This study therefore aimed to identify the prevalence and associations of impaired cognitive function among a referred population of people with CKD.

Methods

The NURTuRE-CKD cohort recruited 2996 people with an estimated Glomerular Filtration Rate (eGFR) of 15-59 ml/min/1.73m^2 (CKD-EPI equation) or ≥60ml/min/1.73m^2 with a urine albumin to creatinine ratio

(uACR) of more than 30mg/mmol referred to one of 16 secondary care nephrology clinics. Baseline data were collected between 2017-2019 including sociodemographic, anthropometric, biochemical, and clinical information and included the 6-item cognitive impairment test (6-CIT), a commonly used cognitive screening instrument.[6] Other scores collected included the Hospital Anxiety and Depression score (HADS), EQ-5D-5L as a health-related quality of life (HRQoL) measure and Single Item Literacy Screener (SILS).

Prevalence of impaired cognitive function (defined as 6-CIT score of 8 or more out of 28) was calculated and multivariable mixed effects logistic regression models used to identify associations with impaired cognitive function. The multivariable model was adjusted for known factors impacting cognitive impairment and recruitment region as a random effect.

Results

A total of 2743/2996 (91.6%) participants had complete 6-CIT data. Median age was 66 years and 41% were female. Median eGFR was 34ml/min/1.73m^2. Prevalence of cognitive impairment was 8.7% (240/2743), rising from 5.3% in those <65 to 10.6% in those ≥65 years. eGFR was not associated with cognitive impairment on univariate analysis. After adjustment, greater likelihood of cognitive impairment was independently associated with older age, Asian and Black ethnicity (compared to white), and limited health literacy. Lower likelihood of cognitive impairment was associated with better HRQoL and higher education attainment (Figures 1&2).

Discussion

Cognitive impairment was relatively common in this cohort of people with CKD. Similar associations for cognitive impairment with age and education in a CKD population had also been identified in CKD-REIN - a prospective cohort of CKD patients recruited from secondary care in France, though using a different cognitive function measure.[1] Associations of limited health literacy, ethnicity, and HRQoL with cognitive impairment were identified risk factors that could aid clinicians in recognising high risk patients to prompt screening and improve management. Follow-up data will allow longitudinal analyses to explore associations between impaired cognitive function and health-related outcomes, between kidney function and change in cognitive function and risk factors for change in cognitive function, including the role of inflammatory markers. Limitations: this analysis only used baseline data so causality cannot be established, 6-CIT is a screening rather than diagnostic tool for cognitive impairment.

Figure 1. **Multivariable associations with cognitive impairment (6CIT score 8 or above)**

Independent variables	Mixed effects logistic regression model of 6-item cognitive impairment test (6-CIT) result of 8 or above vs. independent variables		
	Odds Ratios	95% confidence intervals	p
Age	1.016	1.003 to 1.030	**0.019**
Sex [Female]	0.792	0.581 to 1.079	0.139
Ethnicity [Asian]	2.338	1.276 to 4.284	**0.006**
Ethnicity [Black]	2.683	1.249 to 5.762	**0.011**
Ethnicity [Mixed]	0.867	0.111 to 6.783	0.892
Ethnicity [Other]	3.742	1.187 to 11.802	**0.024**
Education [GCSE/NVQ/A-level]	0.42	0.301 to 0.586	**<0.001**
Education [Higher education]	0.241	0.146 to 0.397	**<0.001**
Diabetes	0.845	0.609 to 1.172	0.313
Cerebrovascular disease	1.369	0.901 to 2.080	0.142
Mean Mean arterial pressure (MAP)	1.004	0.993 to 1.015	0.444
Obesity (Body mass index (BMI) >30kg/m^2)	0.881	0.647 to 1.200	0.423
Current smoking	1.042	0.626 to 1.737	0.873
Alcohol consumption >21 units per week	0.955	0.493 to 1.850	0.892
Hospital anxiety and depression scale depression score 8 or above	0.882	0.603 to 1.290	0.518
EQ5D3L mapped index value	0.375	0.207 to 0.678	**0.001**
Statins	1.359	0.986 to 1.873	0.061
Sarcopenia present	1.366	0.993 to 1.877	0.055
Single item literacy screener (SILS) score above 2	2.828	1.685 to 4.745	**<0.001**
R^2 of model	0.291		
p-values in bold <0.05, model adjusted for recruitment region as a random effect			
Reference categories - sex = male, ethnicity = white, education = none, obesity = BMI <30kg/m2			

Figure 2. Forest plot of Multivariable associations with cognitive impairment (6CIT score 8 or above)

Multivariable mixed effects logistic regression of independent variables vs. 6-item cognitive impairment test score of 8 or above, odds ratios with 95% confidence intervals- * denotes p<0.05
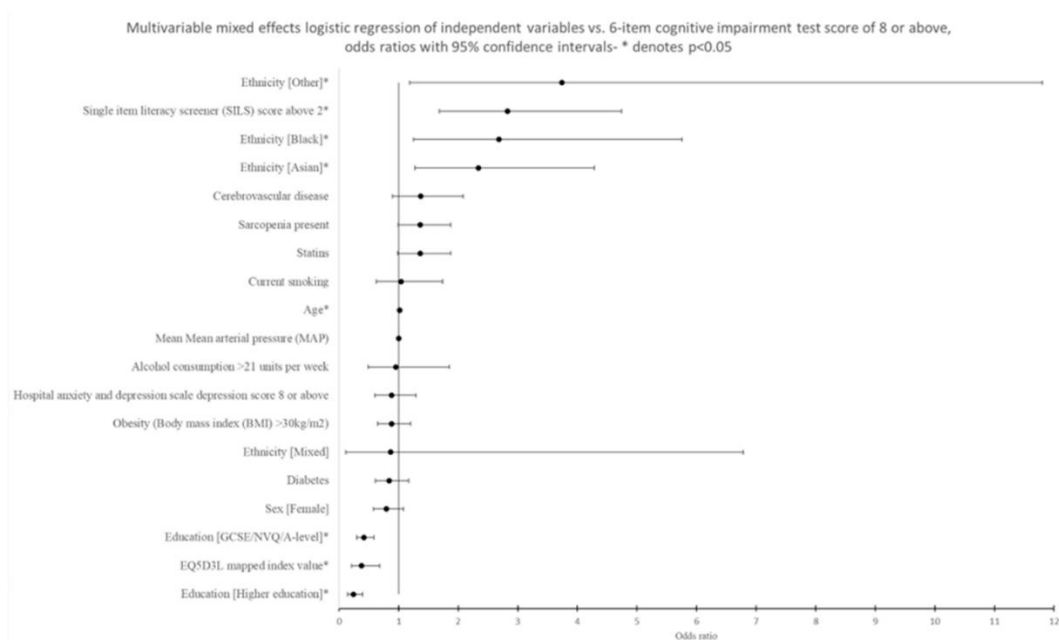
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Poster number: 359

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How do we treat mineral bone disease post transplantation? A single centre experience.

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Dr Thomas Coupe

Biography
IMT Doctor

Abstract

Background: Mineral bone disease (MBD) causes increased morbidity and mortality. Previous studies report resolution of hyperparathyroidism in 30% of kidney transplant recipients (KTR) after 1 year and 57% 2 years post transplantation. Current guidelines recommend different strategies of treating hyperparathyroidism without guidance on de-escalation of therapy post transplant. Some centres stop all MBD treatment at the time of transplantation. We looked to determine what medical treatments our KTR were taking for management of MBD.

Methods: A cross-sectional retrospective observational study of all KTR at our centre between 2021-2022 were included. Clinical outcome data was collected from electronic patient records including medications were grouped into; Cinacalcet, Alfacalcidol, Vitamin D3 (VitD3) and/or combinations of these for treatment of MBD. The length of time KTR were on these medications and biochemical data was collected. Paired t-tests and ANOVA were used to perform statistical analysis with a $p<0.05$ significant level.

Results: There were 509 KTR between 2021-2022. 9 were excluded due to missing data. 275 male, 225 female with a median age 56yrs (21-87yrs). From 500 KTR; 2% were on Cinacalcet, 4% Cinacalcet+Alfacalcidol, 1% Cinacalcet+Alfacalcidol+VitD3, 30% Alfacalcidol, 15% Alfacalcidol+VitD3, 21% VitD3 and 27% on none. Mean time after transplantation was; 8.1yrs, 6.4yrs, 7.1yrs, 7.7yrs,10.6yrs, 10.7yrs and 10.6yrs, respectively. Mean Creatinine was significantly different between the 2021 and 2022 in the different treatment groups ($p<0.04$) with no significant changes in mean GFR. Mean Creatinine in all the groups except the cinacalcet alone decreased. Those on Cinacalcet+Alfacalcidol or Cinacalcet+Alfacalcidol+VitD3 had the highest creatinine's that decreased from 2021 to 2022. Mean PTH (pmol/L) levels decreased from 2021-2022 in all of the groups (11.7-10.7, 36-14.2, 71.8-61.3, 16.2-13.1, 12-8, 10-9, 9.2-8.7, respectively, $p<0.05$). Calcium adjusted (CA) levels were lower in the Alfacalcidol+VitD3 and VitD3 groups alone (2.0mmol/L). Mean Phosphate levels remain unchanged. Phosphate binders were used in all groups except Cinacalcet and VitaminD3.

Conclusion: A range of combination therapies are used for MBD management. We propose a de-escalation of therapy post transplantation guidance will reduce polypharmacy. Limitation is a single centre experience.

Poster number: 360

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Is there a link between mineral bone disease, ethnicity and kidney transplantation?

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Dr Francisco Montero

Abstract

Background: Health inequalities have been reported internationally to affect access to transplantation in ethnic minorities. It is unclear whether mineral bone disease treatments are also affected by this. Several studies have shown that there are ethnic differences in bone mineral metabolism that may further predispose kidney transplant recipients (KTR) to increased fracture risk, morbidity and mortality. Our centre serves a multi-ethnic population in South West London. This cross-sectional observational study looks at the current distribution of mineral bone disease medications and whether this is influenced by ethnicity.

Methods: All KTR active in the transplant programme in 2021-2022 were included. Data was collected from the electronic patient record. All those with a documented ethnicity were analysed together with biochemical markers and medications used for mineral bone disease. T-test and ANOVA statistical tests were used with significance $p < 0.05$.

Results: 509 KTR with 40 (8%) patients with unknown ethnicity were excluded. 45% White, 18% Black, 19% Asian, 2% Chinese, 8% other. 469 KRT analysed: 257 Male, 212 Female with a median age of 56yrs (21-87yrs). PTH levels were higher in Black people (18.8umol/L) and significantly decreased in all ethnicities ($p < 0.05$) between 2021-2022. Adjusted calcium levels were significantly increased in all ethnicities ($p < 0.05$) except Chinese. Phosphate levels significantly decreased in all ethnicities ($p < 0.01$) and higher in Asians. Creatinine was significantly raised in Whites compared to Asian and Other populations ($p < 0.05$) in 2021 but not seen in 2022. All ethnicities on Cinacalcet had significantly lower Creatinine in 2021 ($p < 0.01$) and 2022 ($p < 0.05$). All treatments were given to White with higher numbers on Cinacalcet+Alfacalcidol+VitaminD3 combination. Black persons predominantly on Cinacalcet+Alfacalcidol, Asians on Alfacalcidol+VitaminD3 and Chinese on Cinacalcet. Significant lower intake of Vitamin D3 in KTR ($p < 0.05$) in all ethnic groups.

Conclusion: There is a disparity in transplantation of ethnic minority groups with White people predominantly being transplanted despite our multi-ethnic population. Treatment variations are seen between ethnic groups that can be multifactorial. These findings could suggest health inequalities and we are currently investigating potential drivers behind this.

Poster number: 361

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Does home blood pressure monitoring improve blood pressure-related outcomes in people living with chronic kidney disease? A systematic review with meta-analysis

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Dr Thomas Wilkinson

Biography
I am a Research Fellow based in the NIHR Biomedical Research Centre (BRC) based at the Leicester Diabetes Centre Leicester General Hospital. My research focuses on multiple long-term conditions and multimorbidity with a specific interest in frailty sarcopenia and kidney disease. I have a background in exercise physiology and I am interested in the role of lifestyle interventions in those living with chronic disease.

Abstract

Introduction

High blood pressure (hypertension) is an important risk factor for cardiovascular disease and chronic kidney disease (CKD) progression. The successful and adequate control of blood pressure and prevention of hypertension is therefore a fundamental feature of CKD medical management. Home blood pressure monitoring (HBPM) has been suggested as a viable alternative to office and ambulatory blood pressure monitoring due to its wide availability and cost-effectiveness. Evidence on how HBPM may improve patient self-monitoring and subsequent blood pressure-related outcomes is limited from clinical practice guidelines and no systematic review has determined the effect of HBPM on blood pressure-related outcomes in CKD. This review aimed to determine the effect of HBPM on systolic (SBP) and diastolic blood pressure (DBP), and blood pressure goal attainment in people living with CKD.

Methods

We searched medical literature databases for eligible studies presenting pre- and post-data for interventions utilising HBPM up until August 2023. Study quality was assessed using the NHLBI tools for quality assessment. High heterogeneity prohibited a meta-analysis so estimates of the proportion of effects favouring the intervention were calculated along a sign test to examine the probability of

observing the given pattern of positive effect direction across studies. The NHLBI tools for quality assessment were used for the assessment of study quality and risk of bias.

Results

Eighteen studies were included (n=1,187 participants, mean age 56.7 (±7.7) years). Nine studies were RCTs, whilst nine were of quasi-experimental design. Five studies were conducted in people undergoing haemodialysis, seven in people with non-dialysis dependent CKD, and the remaining either conducted in mixed samples or renal transplant recipients. In most studies, HBPM was conducted within the context of additional high-level tailored support. In the majority of interventions, values from HBPM were used to inform medical management.

Overall, interventions utilising HBPM had a significant effect on systolic blood pressure (SBP), with 14/16 studies favouring the intervention (88% (95% CI 62% to 98%), P = .002). Favourable effects were also seen on diastolic blood pressure (DBP) (73% (95% CI 45% to 92%), P = .059). HBPM had a favourable effect on blood pressure goal attainment (86% (95% CI 42% to 100%), P = .062). **Table 1** shows an effect direction plot for blood pressure outcomes. Overall, n=7/18 studies were rated as 'good'; n=6/18 were rated as 'fair', and n=5/18 were rated as 'poor'.

Table 1. Effect direction plot showing consistency of outcomes for the included studies

Study	Study design	Population	Intervention n	Blood pressure-related outcomes			
				Systolic BP	Diastolic BP	BP goal attainment	MAP
Kauric-Klein and Artinian, 2007	RCT	HD	36	▲	◄►	-	-
Kauric-Klein, 2012	RCT	HD	59	▲	▲	▲	-
Da Silva et al. 2009	RCT	HD	47	▲	▲	-	-
Bansal et al. 2021	RCT	HD	25	◄►	◄►	-	-
Okoro et al. 2022	RCT	NDD	73	◄►	◄►	▲	-
Williams et al. 2018	RCT	NDD	39	▲	▲	-	-
McGillicuddy et al. 2013	RCT	KRT	11	▲	▲	-	-
Humalda et al. 2020	RCT	Mixed	50	▲	▲	-	-
Meuleman et al. 2017	RCT	Mixed	67	▲	▲	-	-
White, 2009	Quasi	NDD	46	-	-	▲	-
Dopp et al., 2023	Quasi	NDD	55	▲	▲	▲	-
Hopley et al. 2019	Quasi	NDD	17	▲	▲	◄►	-
Ong et al. 2016	Quasi	NDD	47	▲	▲	-	-
Warner et al. 2018	Quasi	NDD	25	▲	-	▲	-
Aberger et al. 2014	Quasi	KTR	66	▲	▲	-	-
Van Lint et al. 2015	Quasi	KTR	30	-	-	-	▲
Migliozzi et al. 2015	Quasi	KTR	84	▲	▲	-	-
Lingerfelt and Hodnicki, 2012	Quasi	HD	36	▲	-	▲	-
Studies with positive effect (n, %)				14/16 (88%)	11/15 (73%)	6/7 (86%)	1/1 (100%)
Overall effect direction꓄				▲	▲	▲	-
P value				.002*	.059	.062	-

RCT = Randomised control trial; BP = Blood pressure; MAP = Mean arterial pressure; NDD = Non-dialysis dependent chronic kidney disease; KRT = Kidney transplant recipient

In this plot, upward arrow ▲ indicates a positive health effect, downward arrow ▼ indicates a negative health effect, and sideways arrow ◄► indicates no change/mixed/conflicting findings. Final sample size (n) in the intervention group: large arrow ▲ indicates >300, medium arrow ▲ indicates 50–300 and small arrow ▲ indicates <50

꓄Overall effect direction reported if >70% of categorized study outcomes had similar direction of effect

Study quality denoted by row color: green—good; orange—fair; red—poor

P value is taken from a two-sided binomial probability test, P<.005 and denoted by *

Conclusion

The addition of HBPM as part of a multicomponent intervention may lead to clinically significant reductions in blood pressure. The reasons why HBPM may effectively improve blood pressure management are multifactorial and complex but may include increased self-management behaviour. Additionally, with more reproducible monitoring and more accurate values, healthcare professionals

may make better-informed adjustments to any antihypertensive medication and thus improve long-term blood pressure control and blood pressure goal attainment. While HBPM may be recommended as part of a comprehensive approach to managing blood pressure control, our findings highlight a need for adequately powered, well-designed, and high-quality studies to evaluate this intervention in patients with CKD.

Study Registration Number

CRD42022383959

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Relation of Copeptin with Diabetic and Renal Function Markers Among Patients with Diabetes Mellitus Progressing Towards Diabetic Nephropathy

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Biography
i am working as a transplant physician and nephrologist in karachi pakistan .i started my carrier in uk after completing my MRCP AND FRCP i did my Msc in organ transplantation and also completed my FCPS in nephrology .i have started the renal transplant program in dow university hospital and till now we have done more then 600 transplants .

Abstract

Background

Arginine vasopressin (AVP) plays an important role in the pathophysiology of Diabetes Mellitus (DM) and its related complications like diabetic nephropathy. Copeptin is considered as a reliable surrogate biomarker of AVP. If raised levels of copeptin in diabetic patients are detected earlier, prognosis of DM can be improved by timely modulating the treatment strategy.

Aims of the study

The study is therefore planned to assess copeptin levels in different groups of DM and in healthy controls to suggest a better and reliable biomarker for progressive stages of DM.

Methods

Subjects were recruited as controls, pre diabetes, DM without nephropathy and diabetic nephropathy. Serum copeptin levels were measured by ELISA. While, Blood Urea Nitrogen (BUN), creatinine, Glycosylated Hemoglobin (HbA1c) and spot urinary albumin creatinine ratio (UACR) were done using spectrophotometry. Statistical analysis was done using ANOVA and Pearson's correlation tests on SPSS.

Results

The average copeptin levels were 215.096 pg/mL. Copeptin levels were significantly elevated in subjects with positive family history of DM (p = 0.025), levels were also raised in pre diabetes kpatients (252.85 pg/mL) as compared to other groups. Copeptin levels were also correlated with HbA1c r = 0.171 (p =

0.101), BUN r = 0.244 (p = 0.007), creatinine r = 0.215 (p = 0.018), UACR r = 0.375 (p = <0.001) and GFR r = 0.215 (p = <0.019).

Conclusion

The significant correlation of copeptin with diabetic and renal biomarkers, along with its positive association with family history of DM support its' role as an early and reliable biomarker of DM and its associated nephropathy.

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Poster number: 363
Submission number: 206

Increased risk of recurrent stroke in patients with impaired kidney function: results of a pooled analysis of individual patient data from the MICON international collaboration

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Dr Philip Nash

Biography

Philip Nash is a nephrologist in training, currently reading for a PhD as a stroke clinical research fellow at University College London. He Studied medicine as a postgraduate, graduating from St George's, University of London in 2011 with a merit in clinical sciences. He first received a masters degree in Natural Sciences from the University of Cambridge in 2005. He is currently the clinical fellow for OPTIMAS, a randomised controlled trial investigating the optimal timing for initiation of anticoagulation after acute ischaemic stroke and is fortunate to receive a grant from the British Heart Foundation. His research interests include cerebral small vessel disease, kidney disease as a risk factor for stroke and cardiovascular disease, and stroke secondary prevention. He hopes that novel treatments will be developed for patients with chronic kidney disease and cerebral small vessel disease. For the past 2 years he has been organising the monthly education meetings for the University College London Queen Square Stroke Service.

Abstract

Introduction: Patients with chronic kidney disease are at increased risk of stroke[1-3] and frequently have cerebral microbleeds[4-6]. Whether high-risk patients from stroke populations with reduced kidney function are at increased stroke risk has not been firmly established. We aimed to determine whether reduced kidney function is associated with microbleed presence, distribution and severity, and the risk of recurrent stroke.

Methods: We used pooled data from the Microbleeds International Collaborate Network (MICON) to investigate associations of reduced kidney function, defined as estimated glomerular filtration rate <60 ml/min/1.73 cm^2, with microbleed presence, distribution (strictly deep or infratentorial, strictly lobar and mixed distributions) and severity. We investigated whether eGFR <60 was associated with increased

risk of recurrent ischaemic stroke (IS), intracranial haemorrhage (ICrH) and a composite of those two outcomes.

Results: 11,175 patients (mean age 70.7 ±12.6 years, 42% female) were included in the analysis, of which 2815 had reduced kidney function. Compared to eGFR >60, eGFR <60 was associated with microbleed presence (OR 1.14, 95% CI 1.03-1.26, **Fig. 1**), microbleed severity (aOR 1.17, 95% CI 1.06-1.29, **Fig. 1**), increased risk of a composite of IS and ICrH (aHR 1.33, 95% CI 1.14-1.56) and increased risk of IS (aHR 1.33, 95% CI 1.12-1.58). The risk of recurrent IS and composite stroke events increased as the eGFR worsened (**Table 1**, **Fig. 2**). Reduced kidney function was not associated with ICrH risk (aHR 1.07, 95% CI 0.70-1.60). Compared to having no microbleeds, eGFR was significantly lower in those with strictly lobar microbleeds (adjusted mean difference (aMD) in eGFR -2.10 ml/min/1.73 cm^2, 95% CI -3.39 to -0.81) and mixed microbleeds (aMD -2.42, 95% CI -3.70 to -1.15), but not strictly deep microbleeds (aMD -0.67, 95% CI -1.85 to 0.51).

Discussion: Patients with reduced kidney function are at increased risk of recurrent stroke, and this might in part be related to cerebral small vessel disease. Stroke physicians and neurologists should always check for this comorbidity, and check for albuminuria for which there are already established treatments. Additional treatments for this high-risk group could potentially be developed in the future.

Table 1: Recurrent stroke events according to renal function

	Any stroke (ischaemic stroke or intracranial haemorrhage) during follow-up			Recurrent ischaemic stroke during follow-up			Symptomatic intracranial haemorrhage during follow-up		
	Rate per 1000 patient-years	Absolute rate increase per 1000 patient-years	Adjusted hazard ratio (95% CI)	Rate per 1000 patient-years	Absolute rate increase per 1000 patient-years	Adjusted hazard ratio (95% CI)	Rate per 1000 patient-years	Absolute rate increase per 1000 patient-years	Adjusted hazard ratio (95% CI)
Whole cohort	45 (42-48)	-	-	40 (37-43)			7 (6-9)	-	-
Normal eGFR	40 (37-44)	-	Ref.	35 (32-39)	-	Ref.	7 (6-9)	-	Ref.
eGFR <60	58 (51-65)	17 (14-21)	1.33 (1.14-1.56)	51 (45-58)	16 (13-19)	1.33 (1.12-1.58)	8 (6-11)	2 (0-3)	1.07 (0.7-1.60)
eGFR group									
45-60	53 (44-61)	13 (7-17)	1.27 (1.05-1.53)	47 (40-56)	12 (8-17)	1.30 (1.06-1.59)	7 (5-11)	0 (-1-3)	1.02 (0.62-1.66)
30-45	62 (50-78)	21 (13-34)	1.42 (1.11-1.82)	56 (44-70)	20 (11-31)	1.38 (1.05-1.81)	8 (4-15)	1 (-1-7)	1.06 (0.55-2.03)
<30	76 (53-104)	35 (16-60)	1.45 (1.03-2.04)	63 (43-90)	28 (11-51)	1.40 (0.96-2.02)	16 (7-32)	9 (1-24)	1.64 (0.78-3.42)

eGFR estimated glomerular filtration rate

All Cox regression models adjusted for age, sex, East Asian Study Centre, atrial fibrillation, hypertension, diabetes, hyperlipidaemia, ischaemic heart disease, previous stroke, presentation with ischaemic stroke (rather than transient ischaemic attack), smoking and cerebral microbleed presence; shared frailty term included to adjust for potentially corelated data within centres

Fig. 1: Microbleed (CMB) presence and distribution (A) and severity (B) according to severity of impaired kidney function
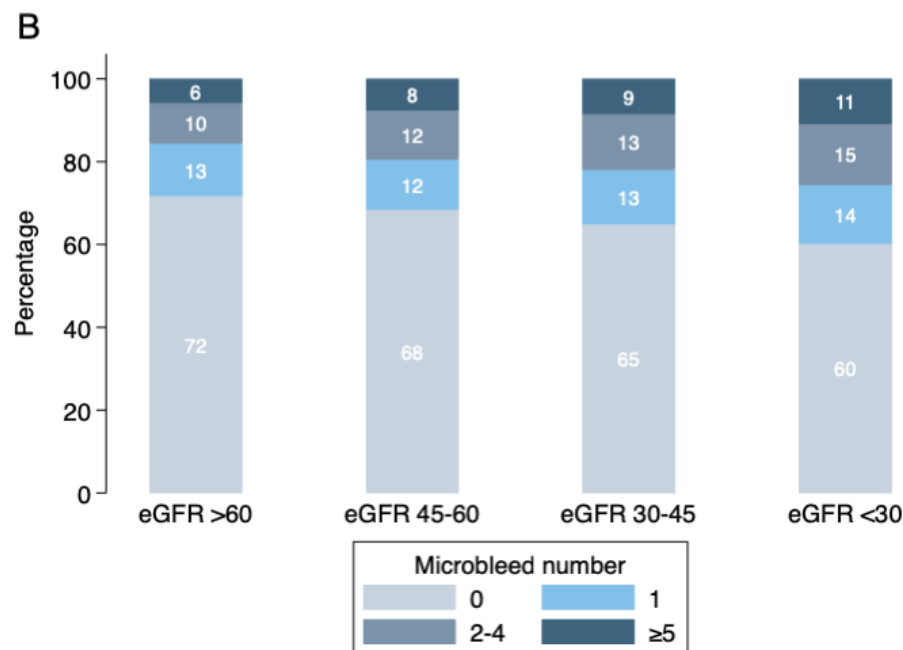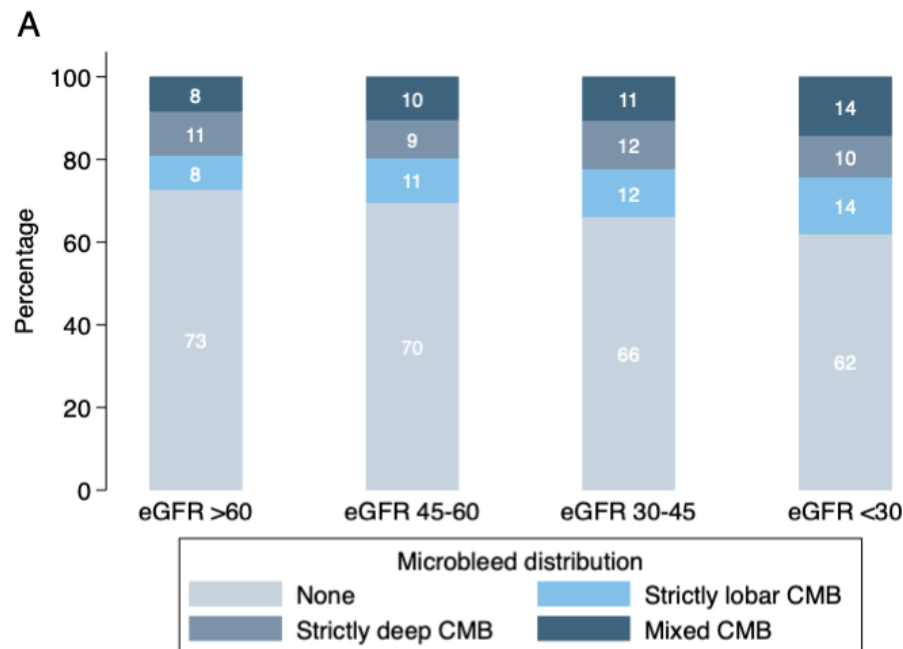
Fig. 2: Kaplan-Meier failure plots showing cumulative stroke events according to
(i) eGFR <60 and (ii) eGFR stage
  A) Composite of recurrent ischaemic stroke and symptomatic intracranial haemorrhage
  B) Recurrent ischaemic stroke
  C) Symptomatic intracranial haemorrhage
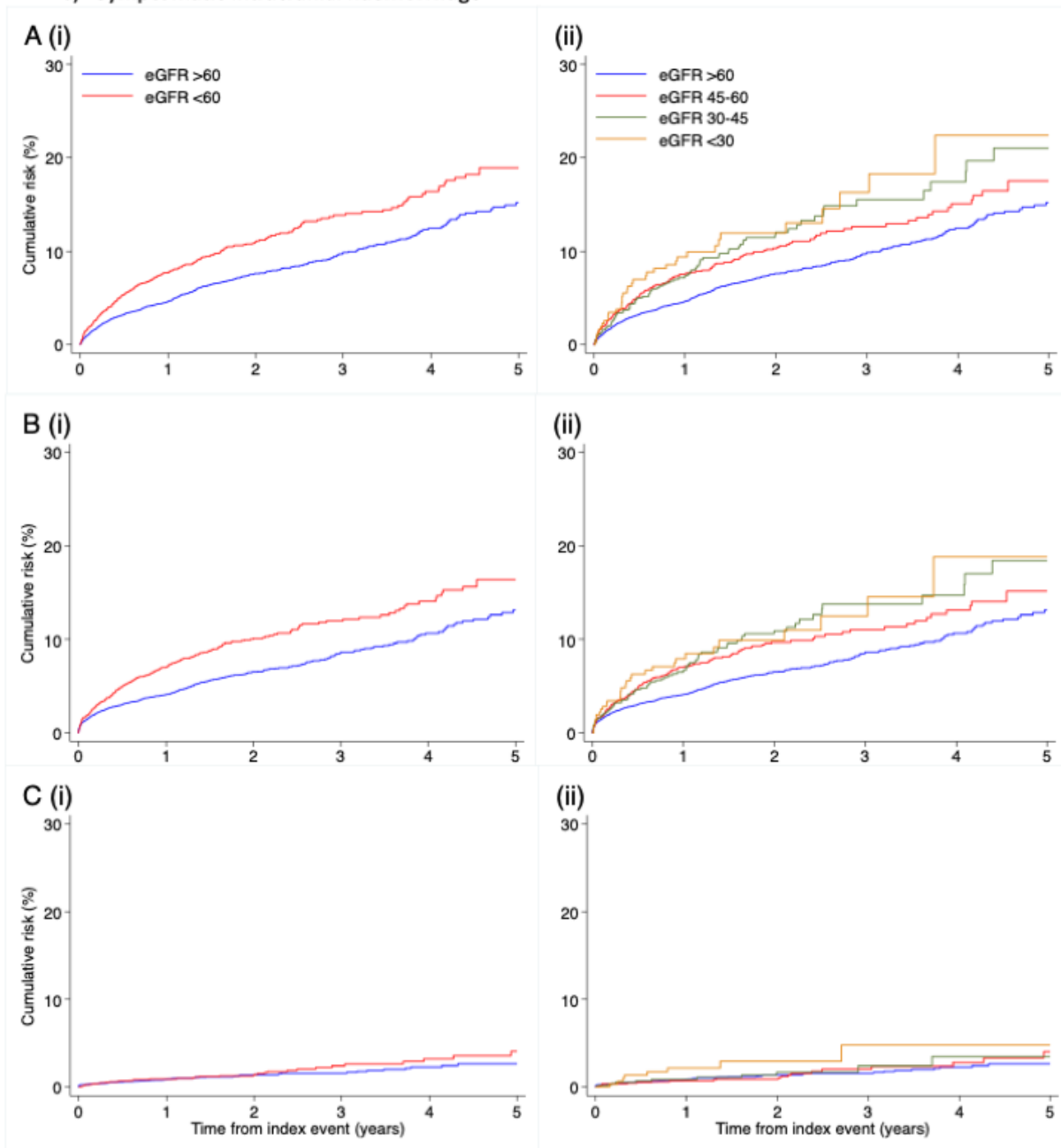
eGFR estimated glomerular filtration rate

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Associations of renal hyperfiltration with recurrent stroke and death: an analysis using pooled data from the MICON multi-centre collaboration

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Dr Philip Nash

Biography
Philip Nash is a nephrologist in training, currently reading for a PhD as a stroke clinical research fellow at University College London. He Studied medicine as a postgraduate, graduating from St George's, University of London in 2011 with a merit in clinical sciences. He first received a masters degree in Natural Sciences from the University of Cambridge in 2005. He is currently the clinical fellow for OPTIMAS, a randomised controlled trial investigating the optimal timing for initiation of anticoagulation after acute ischaemic stroke and is fortunate to receive a grant from the British Heart Foundation. His research interests include cerebral small vessel disease, kidney disease as a risk factor for stroke and cardiovascular disease, and stroke secondary prevention. He hopes that novel treatments will be developed for patients with chronic kidney disease and cerebral small vessel disease. For the past 2 years he has been organising the monthly education meetings for the University College London Queen Square Stroke Service.

Abstract

Introduction: Associations of renal hyperfiltration with vascular events and death have previously been reported in community populations[1-3], but scarcely in stroke populations[4]. High estimated glomerular filtration rate is not screened for in routine clinical practice, but if we can add to existing evidence this could change. We aimed to investigate associations of hyperfiltration with recurrent stroke, death and vascular death in a large multi-centre international population.

Methods: Participating centres from the Microbleed International Collaborative Network contributed data on estimated glomerular filtration rate (eGFR). We investigated associations of filtration category (normofiltration, hyperfiltration and hypofiltration) with the risk of recurrent recurrent ischaemic stroke (IS), symptomatic intracranial haemorrhage (ICrH), a composite of IS and ICrH, death and vascular death. Hyperfiltration was defined as having an eGFR greater than the age and gender-adjusted 95th percentile. Hypofiltration was defined as eGFR <60 ml/min/1.73 cm^2.

Results: 11,175 patients (mean age 70.7, 42% female) were included in the analysis, 575 with hyperfiltration and 2815 with eGFR<60. The hyperfiltration group was similar in age to the normofiltration group, but younger than the hypofiltration group (mean age 69.3 ± 15.0 compared to

68.4 ± 12.5 for the normofiltration group and 77.3 ± 9.7 for the hypofiltration group). Baseline characteristics are shown in **Table 1**. Compared to the normofiltration group, for the hyperfiltration group there were similar event rates for recurrent IS (34 vs. 35 events per 1000 patient-years, **Table 2**) and ICrH (9 vs. 7 events). The rate of the composite of IS and ICrH was slightly lower in the hyperfiltration group (35 vs. 41 events). The rates of death (136 vs. 61) and vascular death (25 vs. 11) were significantly higher in the hyperfiltration group (**Table 3**). In multivariable Cox regression models there was no significant association of hyperfiltration with the risk of composite stroke events (aHR 0.71, 95% CI 0.48 to 1.11), recurrent IS (aHR 0.79, 95% CI 0.51 to 1.20) and ICrH (aHR 0.93, 95% CI 0.40 to 2.15). Compared to normofiltration, hyperfiltration was independently associated with the risk of death from any cause (AHR 1.44, 95% CI 1.15 to 1.80, **Table 3**, **Fig. 1**) and the risk of vascular death (AHR 2.17, 95% CI 1.29 to 3.64). Compared to normofiltration, hypofiltration was independently associated with the risk of composite stroke events (AHR 1.29 95% CI 1.10 to 1.52), recurrent IS (AHR 1.32, 95% CI 1.11 to 1.57), death from any cause (AHR 1.47, 95% CI 1.31 to 1.65) and vascular death (AHR 1.71, 95% CI 1.31 to 2.22).

Discussion: In this large international stroke population, renal hyperfiltration was independently associated with the risk of death, and the risk of vascular death. There was no association of hyperfiltration and recurrent stroke. Nephrology advisory bodies could consider recommending screening for hyperfiltration in primary care to detect increased vascular risk earlier and in younger age groups.

Table 1: Baseline characteristics according to renal filtration

	Normofiltration (n=7785)	Hyperfiltration (n=575)	Hypofiltration (n=2815)	p-value
Clinical data				
Age; years; mean (SD)	68.4 (12.5)	69.3 (15.0)	77.3 (9.7)	<0.001
Sex; female; n	3029 (38.9%)	241 (41.9%)	1452 (51.6%)	<0.001
East Asian study centre	4742 (60.9%)	492 (85.6%)	1439 (51.1%)	<0.001
Atrial fibrillation	3442 (44.5%)	235 (41.2%)	1741 (62.1%)	<0.001
Hypertension	5276 (68.0%)	398 (69.2%)	2345 (83.6%)	<0.001
Diabetes	1716 (22.6%)	143 (25.0%)	880 (31.7%)	<0.001
Hyperlipidaemia	2796 (36.8%)	152 (26.5%)	1208 (43.5%)	<0.001
Previous ischaemic stroke	1021 (13.1%)	86 (15.0%)	525 (18.7%)	<0.001
Previous ICH	99 (1.3%)	12 (2.1%)	56 (2.0%)	0.014
Ischaemic heart disease	860 (11.5%)	38 (6.7%)	565 (20.7%)	<0.001
Heart failure	328 (9.2%)	28 (15.1%)	250 (15.7%)	<0.001
Current smoker	1504 (20.6%)	125 (22.4%)	326 (12.3%)	<0.001
Alcohol use	635 (21.5%)	29 (17.1%)	258 (16.9%)	<0.001
eGFR; mean (SD)	83.7 (13.6)	105.7 (13.8)	44.7 (12.8)	<0.001
Presentation				0.028
Transient ischaemic attack	964 (12.4%)	53 (9.2%)	314 (11.2%)	
Ischaemic stroke	6821 (87.6%)	522 (90.8%)	2501 (88.8%)	
TOAST classification				<0.001
Large artery atherosclerosis	1297 (20.1%)	137 (27.0%)	341 (14.7%)	
Cardioembolic	2864 (44.3%)	206 (40.6%)	1285 (55.3%)	
Small vessel disease	1016 (15.7%)	72 (14.2%)	254 (10.9%)	
Other known cause	274 (4.2%)	25 (4.9%)	68 (2.9%)	
Unknown cause	1007 (15.6%)	68 (13.4%)	374 (16.1%)	

eGFR estimated glomerular filtration rate; *IS* ischaemic stroke; *ICH* intracerebral haemorrhage: *TOAST* Trial of Org 10172 in Acute Stroke Treatment[5.]

Table 2: Recurrent stroke events according to renal filtration

	Any stroke (ischaemic stroke or intracranial haemorrhage) during follow-up			Recurrent ischaemic stroke during follow-up			Symptomatic intracranial haemorrhage during follow-up		
	Rate per 1000 patient-years	Absolute rate increase per 1000 patient-years	Adjusted hazard ratio (95% CI)	Rate per 1000 patient-years	Absolute rate increase per 1000 patient-years	Adjusted hazard ratio (95% CI)	Rate per 1000 patient-years	Absolute rate increase per 1000 patient-years	Adjusted hazard ratio (95% CI)
Whole cohort	45 (42-48)	-	-	40 (37-43)			7 (6-9)	-	-
Normofiltration	41 (37-44)	Ref.	Ref.	35 (32-39)	Ref.	Ref.	7 (6-9)	Ref.	Ref.
Hyperfiltration	35 (23-53)	-5 (-15-8)	0.71 (0.48-1.11)	34 (22-51)	-1 (-10-13)	0.79 (0.51-1.20)	9 (3-19)	2 (-2-11)	0.93 (0.40-2.15)
Hypofiltration	58 (51-65)	17 (14-21)	1.29 (1.10-1.52)	51 (45-58)	16 (14-20)	1.32 (1.11-1.57)	8 (6-11)	1 (0-3)	1.05 (0.71-1.56)

All Cox regression models adjusted for age, sex, East Asian study centre, hypertension, diabetes, hyperlipidaemia, atrial fibrillation, ischaemic heart disease, previous stroke, presentation with ischaemic stroke (rather than transient ischaemic attack), cerebral microbleed presence and number; shared frailty term to account for potentially correlated data within centres

Table 3: Death according to renal filtration

	Death from any cause during follow-up			Vascular death during follow-up		
	Rate per 1000 patient-years	Absolute rate increase per 1000 patient-years	Adjusted hazard ratio (95% CI)	Rate per 1000 patient-years	Absolute rate increase per 1000 patient-years	Adjusted hazard ratio (95% CI)
Whole cohort	84 (80-89)	-	-	16 (14-17)	-	-
Normofiltration	61 (57-66)	Ref.	Ref.	11 (9-13)	Ref.	Ref.
Hyperfiltration	136 (109-166)	74 (52-100)	1.44 (1.15-1.80)	25 (14-40)	14 (5-27)	2.17 (1.29-3.64)
Hypofiltration	135 (125-146)	74 (68-80)	1.47 (1.31-1.65)	26 (22-31)	16 (13-18)	1.71 (1.31-2.22)

All Cox regression models adjusted for age, sex, East Asian study centre, hypertension, diabetes, hyperlipidaemia, atrial fibrillation, ischaemic heart disease, previous stroke, presentation with ischaemic stroke (rather than transient ischaemic attack); shared frailty term to account for potentially corelated data within centres

Fig. 1: Kaplan-Meier failure plots showing cumulative events according to (i) filtration category and (ii) filtration category and eGFR stage

- A) All cause death
- B) Vascular death
- C) Composite of recurrent ischaemic stroke and symptomatic intracranial haemorrahge
- D) Recurrent ischaemic stroke
- E) Symptomatic intracranial haemorrhage
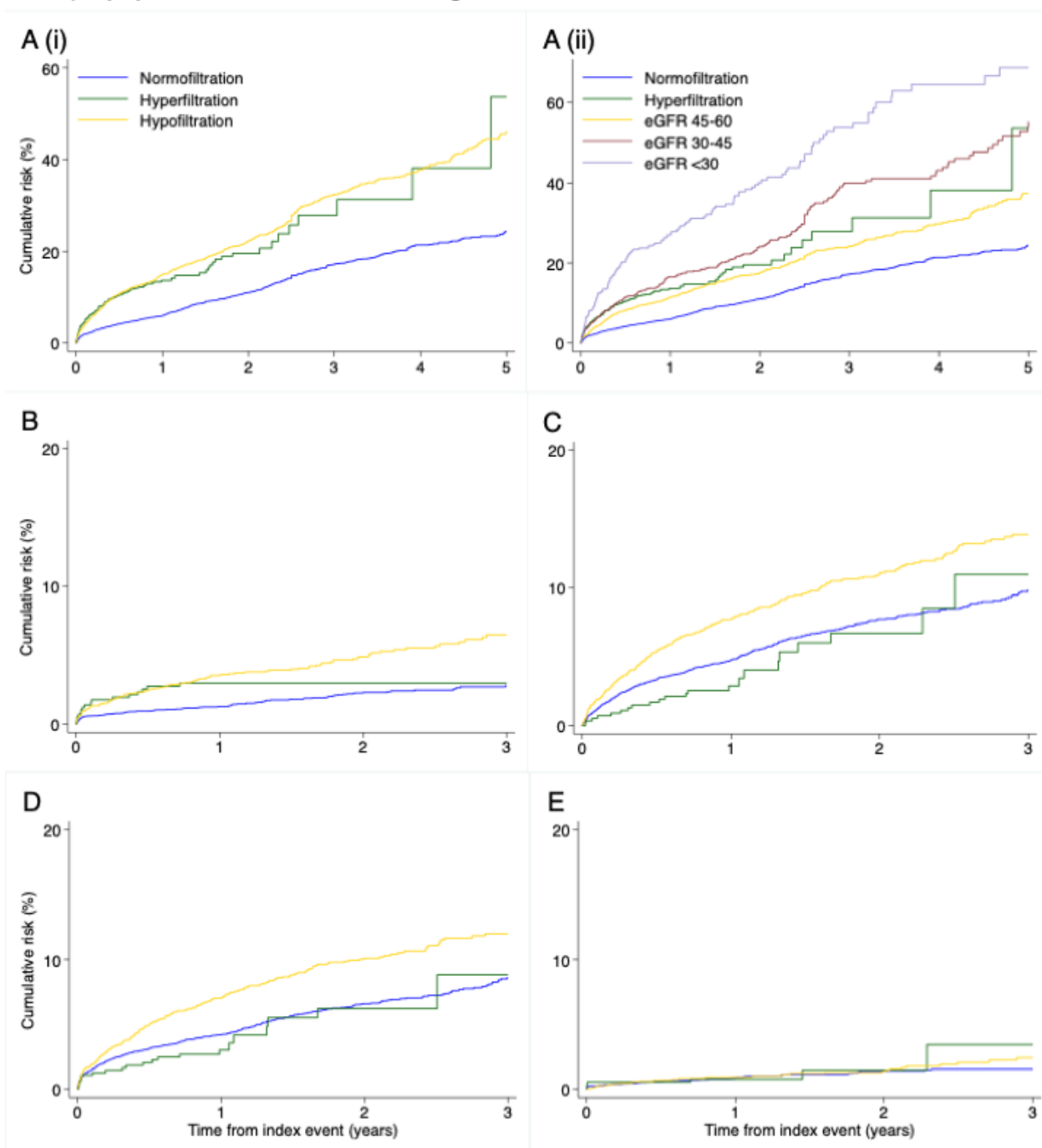
eGFR estimated glomerular filtration rate

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Study Registration Number

Original MICON individual patient data meta-analysis PROSPERO ID - CRD42016036602

Poster number: 365

Submission number: 289

Development of a pharmacist and nurse led cardiorenal optimisation clinic

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Cardiff and Vale University Health Board, Cardiff

Mr Gareth Bryant

Biography
Gareth has been a specialist pharmacist in nephrology and transplant in Cardiff and Vale University Health Board for 8 years. His research interests include: post transplant infections, immunosuppression adherence, management of peritoneal dialysis infections and cardiorenal optimisation. He has contributed to national guidelines, such as the clinical practice guideline: anaemia of chronic kidney disease, as well as being a lecturer in the Welsh School of Pharmacy and Pharmaceutical Sciences.

Abstract

Introduction
Pharmacological interventions, including RAASis, SGLT2is and finerenone have been proven to slow down kidney disease progression, as well as independently decreasing cardiovascular risk in patients with chronic kidney disease (CKD). (1) Initiation of these medications in our patient population has been slow, despite the benefits seen in the clinical trials. This is due to a mixture of unfamiliarity with the new medications and specific monitoring required on initiation.
The aim of the face-to-face cardiorenal optimisation clinic is to have a multi-intervention approach in reducing CKD patients' cardiovascular risk. This was done in two stages, the first involving an education session with a CKD specialist nurse to discuss modifiable cardiovascular risk reduction strategies. These include healthy diet education, exercise advice, smoking cessation referrals, diabetes management and blood pressure management. The second stage involved a medication review by a specialist pharmacist, including screening of the patients' current medication, assessment of proteinuria, diabetes and blood pressure management review. Following this assessment, patients were initiated on a RAASi, statin, SGLT2i or finerenone, if eligible. After initiation of medication, any necessary monitoring would take place via a pharmacist led virtual clinic before handing care over to the GP and nephrologist.

Method
Eligible CKD patients under a nephrologist were identified using the VitalData database. Those with type 2 diabetes or those without diabetes with proteinuria were selected for screening by administrators to exclude those already on the necessary treatments, with subsequent clinical screening by a pharmacist. Those patients with type 1 diabetes, polycystic kidney disease or kidney transplant recipients were excluded. Clinical screening for pharmacological interventions were carried out according to NICE criteria and eligible patients were invited to a cardiorenal optimisation clinic appointment. The patient letter included educational material about CKD and associated cardiovascular risk in order to provide background information on the clinic.

Following the patients face-to-face clinic, PREMs questionnaires were completed by each patient to gather feedback on the clinic experience.

Results

Clinical screening and face-to-face clinics were carried out over a 6-month period and 592 potentially eligible patients were identified. From initial screening, 37% of these patients were already on the necessary treatments for cardiorenal optimisation. 42% of patients were eligible for face-to-face appointments and initiation of treatments, the remaining patients had contraindications to these treatments. PREMs data collection is still ongoing to evaluate patient experience.

Discussion

Utilising the skills of non-medical healthcare professionals has meant that a cohort of high-risk patients have been quickly optimised on the necessary medication to reduce their cardiovascular risk. Alongside receiving lifestyle modification advice, the cardiorenal optimisation clinic has taken a holistic approach in managing these patients and educated them to highlight long term health benefits.
Introducing these medicines to patients in this cohort has enabled us to feed back our positive experiences to GPs, with an aim to instil confidence to enable initiation of these therapies in primary care alongside a supporting clinical pathway. Making these pharmacological and lifestyle interventions early in primary care is essential to ensure that those patients, not yet under nephrology services, gain the health benefits at an early stage in their disease, leading to a decrease in the numbers requiring nephrology intervention in the future.

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Poster number: 366

Submission number: 400

An exploratory study of serum proteomics comparing subjects with treatment-resistant hypertension to controlled hypertension.

Doctor Mohamed Elsadig

Dr Mohammed Awais Hameed, University Hospitals Birmingham NHS Foundation Trust. Professor Dimitris Grammatopoulos, University of Warwick. Professor Indranil Dasgupta, University of Warwick. Professor Paramjit Gill, University of Warwick. Dr Matej Medvecky, University of Warwick

Doctor Mohamed Elsadig

Biography
Mohamed is a renal and general internal medicine speciality trainee at West Midlands Deanery. He is a final-year PhD student at Warwick Medical School. He attained his MBBS in 2009 from Omdurman Islamic University- Sudan. He has been a member of the Royal College Of Physicians (UK) since 2016. His research area of interest is resistant hypertension and proteomics of hypertension and cardiovascular diseases.

Abstract

Introduction

The mechanism of treatment-resistant hypertension (TRH) is not fully understood yet. Individuals with Treatment-Resistant Hypertension (TRH) have at least a 50% higher risk of developing cardiovascular disease, as well as the development of chronic kidney disease, End-Stage Kidney Disease, and death compared to non-TRH individuals. Studies suggest the involvement of vascular endothelial dysfunction and systemic inflammation as contributors to the pathogenesis. This study aims to identify any measurable differences in protein abundance between two groups of hypertensive adults, controlled hypertension (CH) and TRH, using proteomics analysis techniques. To our knowledge, no published study carried out proteomic analysis techniques in the search for the upstream mechanisms to explain resistant hypertension.

Methods:
The study samples were obtained from an existing observational cohort study involving CH and TRH groups; venous blood samples were previously stored at -80°C, and appropriate consenting and ethical approval was obtained. TRH was defined as blood pressure (BP) of ≥140/90 mmHg on ≥3 antihypertensive agents or controlled BP (≤140/90 mmHg) after taking ≥ 4 antihypertensive agents. CH is defined as any BP ≤ 140/90 mmHg on ≤3 antihypertensive agents. The study was conducted in two phases: the discovery phase, where 60 samples of matched groups (CH, n=30, TRH n=30) Peripheral venous serum samples were initially depleted from the highly abundant proteins before undergoing trypsin digestion, this was followed by Liquid Chromatography Mass Spectrometry analysis. The validation phase included 140 candidates (CH n=81, TRH n=59). Results were statistically

analysed using an independent T-test; P valve <0.05 was considered statistically significant. Gene Ontology (GO) description is used for the functional description of the proteins.

Results:

Full results analysis is still undergoing by the time this abstract is being submitted. However, 11 different proteins were found to be significantly different in their expression between the two groups: Alpha 1B glycoprotein, Inter alpha trypsin inhibitor heavy chain H3, Leucine-rich alpha 2 glycoprotein, Complement component C9, Lumican, Complement factor D, Contactin 1, Lysozyme C, Vascular cell adhesion protein 1, Phospholipid transfer protein, and von Willebrand factor.

Conclusion:

The preliminary GO analysis suggests that the above proteins are involved in vascular integrity, endothelial function, and inflammatory response. Significant differences exist in the protein expression between TRH and CH patients. This may allow a better understanding of TRH and treatment strategies.

Poster number 367: WITHDRAWN

Poster number 368: WITHDRAWN

Poster number: 369

Submission number: 478

Microvascular disease following gestational diabetes mellitus: Analysis of superficial retinal vessel density, as measured by OCT-A, and standard kidney disease risk assessment

Dr Mairéad Hamill[1], Dr Tanvii Mansukhani[2], Dr Cristina Gomez[2], Dr Antonio DeMarvao[1], Dr Argyro Syngelaki[2], Professor Kypros Nicolaides[2], Dr Kate Bramham[1]

[1]Department of Women and Children's Health, Faculty of Life Sciences and Medicine, King's College London. [2]Fetal Medicine Research Institute, King's College Hospital, London

Dr Mairéad Hamill

Biography
PhD candidate KCL/ Nephrology and General Internal Medicine Trainee (Republic of Ireland)

Abstract

Introduction:

Diabetic nephropathy is a common cause of chronic kidney disease (CKD). Gestational diabetes mellites (GDM) is a risk factor for T2DM. Optical coherence tomography angiography (OCT-A) is as a non-invasive imaging technique for visualizing retinal microvasculature. A reduction in retinal vessel density, as recorded by OCT-A, has been noted in individuals with diabetic kidney disease. These studies of microvascular disease have so far primarily focused on populations with established nephropathy and retinopathy. The aim of this study was to perform a microvascular disease assessment, and to analyse the relationship between VD and other clinical and biochemical parameters in a cohort at increased risk of CKD.

Methods:

This single-centre prospective study was conducted between 1st of October and 20th of December 2023. Local ethical approval was obtained. Women who had been diagnosed with GDM were invited to attend an in-person review at six months postpartum. Blood pressure (BP), height and weight were recorded. Body mass index (BMI) was calculated by dividing the woman's weight in kilograms by height in metres squared. Blood and urine samples were taken for HbA1c, renal profile and urine albumin creatinine ratio (uACR). Fundal photography, OCT and swept- source OCT-A (Triton DRI-OCT, Topcon) were performed. Vessel density (VD) was obtained by dividing the area occupied by vessels by the total area measured. This measurement, which was expressed as a percentage, was automatically generated using Topcon software. Each participant's right eye was used for analysis. Image quality was automatically graded from 0 to 100 by built in software. Images with a quality index of less than 65 were excluded. A multiple linear regression model was performed to analyse relationship between age, uACR, BP, HbA1C, serum creatinine and the outcome variable VD. Statistical analyses were performed using Stata and p values of less than 0.05 were considered statistically significant.

Results:

Of the 105 women who attended, 32 were excluded due to image quality and missing data. The cohort (n=73) had a mean age of 35 ± 4.5 years. Women of white ethnicity accounted for 64.4% (n=47) of the cohort; 28.8% (n=21) were Black and 6.8% (n=5) Asian. The mean BMI was 28.9 ± 6.8 kg/m2. 16.4% (n=12) of the cohort had a history of hypertension. The mean HbA1c was 39.8 ± 10.1 mmol/mol. The mean creatinine was 62.5 ± 11.1 μmol/L and mean uACR was 2.49 ± 4.4 mg/mmol. The mean foveal VD was 20.6 ± 4.3% with a mean image quality of 69.9 ±4.6. The linear regression model failed to identify any relationship between potential predictors and the outcome variable of VD.

Discussion:

A comprehensive microvascular disease assessment following GDM may allow individual risk stratification and may be useful in assessing the efficacy of pharmacologic interventions for individuals at increased risk of diabetic kidney disease. The absence of a clear relationship between components of a standard nephrology assessment and OCT-A changes may be due to sample size or may reflect temporal differences in VD reduction and development of albuminuria.

Poster number: 370

Submission number: 516

CT coronary angiography metrics and the risk of incident CKD: a post-hoc analysis of the SCOT-HEART trial.

Dr Gavin Chapman[1,2], Dr Peter Gallacher[1], Dr Eve Miller-Hodges[1,2], Dr Robert Hunter[1,2], Professor Nicholas Mills[1], Professor David Newby[1], Professor Michelle Williams[1], Professor Neeraj Dhaun[1,2]

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Dr Gavin Chapman

Biography
I am a Clinical Research Fellow, and recently appointed Specialist Registrar in Renal Medicine, working at the University of Edinburgh. I graduated from the University of Edinburgh in 2017, and since then have completed my Foundation Training and Internal Medicine Training. My research is currently focused on the link between cardiovascular disease and kidney disease. I have previously undertaken research into ANCA-associated vasculitis (AAV). Specifically, I have published research evaluating the role of interval kidney biopsy in these patients, and collaborated with colleagues from elsewhere in the UK in the development of a kidney risk score in AAV.

Abstract

Introduction

Chronic kidney disease (CKD) is increasingly common, and cardiovascular disease is its commonest complication. Once diagnosed, CKD is progressive and current treatments focus on delaying progression to kidney failure alongside reducing cardiovascular risk. It is not currently possible to reliably identify those with normal kidney function who will develop CKD in the future. Metrics from computed tomography coronary angiography (CTCA) (e.g., calcific and occlusive coronary artery disease) predict incident myocardial infarction and death, including in those with CKD. Here, we examined whether CTCA metrics associated with incident CKD.

Methods

In a post-hoc analysis of the SCOT-HEART trial (a multicentre, randomised controlled trial of CTCA in patients with suspected angina),[1] we analysed routinely collected biochemistry data from time of enrolment. Using Cox modelling, we investigated the association between CTCA metrics (e.g., coronary artery calcium score, coronary plaque burden, obstructive coronary artery disease) and the risk of incident CKD defined according to current guidelines.

Results

Of 4,146 patients recruited to the SCOT-HEART trial, we identified 1,487 patients (median age 58 years [interquartile range [IQR], 51-65]; 58% male) in whom routinely collected biochemistry data were available and who did not have CKD at enrolment (median baseline eGFR 95 ml/min/1.73m^2 [IQR, 85-102]). Over a median follow-up of 10.1 years (IQR 9.0-11.2), 248 patients (16.7%) developed CKD. These patients were older, had a higher BMI, were more likely to have diabetes, hypertension, and/or peripheral vascular disease, and had lower serum total cholesterol and baseline eGFR (p<0.05 for all) (**Table 1**).

Table 1: Baseline characteristics

	Preserved kidney function (n=1,239)	Chronic kidney disease (n=248)	P value
Male, n (%)	723 (58)	145 (58)	0.99
Age, years	57 (50-63)	64 (59-69)*	<0.01
BMI, kg/m^2	28.4 (25.5-32.4)	30.0 (26.8-34.4)*	<0.01
Co-morbidities, n (%)			
Hypertension	470 (38)	131 (53)*	<0.01
CAD	135 (11)	40 (16)*	0.02
Diabetes mellitus	121 (10)	44 (18)*	<0.01
CVD	29 (2)	10 (4)	0.13
Atrial fibrillation	29 (2)	9 (4)	0.27
PVD	12 (1)	7 (3)*	<0.05
Smoking status, n (%)			
Current smoker	273 (22)	31 (12)*	<0.01
Ex-smoker	363 (29)	96 (39)*	<0.01
Non-smoker	602 (49)	121 (49)	0.99
Family history of CAD, n (%)	485 (39)	90 (36)	0.43
Total cholesterol, mmol/L	5.5 (4.7-6.3)	5.2 (4.4-6.0)	<0.01
Blood pressure, mmHg			
Systolic	140 (128-155)	145 (130-160)*	<0.01
Diastolic	80 (74-90)	80 (73-90)	0.53
Anginal symptoms, n (%)			
Typical angina	524 (42)	150 (61)*	<0.01
Atypical angina	291 (24)	55 (22)	0.68
Non-anginal	424 (34)	43 (17)*	<0.01
Baseline eGFR, ml/min/1.73m^2	97 (89-104)	79 (73-89)*	<0.01

Of 1,487 patients, 678 (46%) underwent CTCA, of whom 102 (15.0%) developed CKD. In those who did not undergo CTCA (809/1,487, 54%), 18.0% developed CKD. Those patients who underwent CTCA and developed CKD had higher coronary artery calcium score (CACS) (median CACS 126 *versus* 34; p<0.05), were more likely to have obstructive coronary disease (52% *versus* 30%; p<0.05), had a greater burden of low-attenuation non-calcified plaque (6.6% *versus* 4.9%; p<0.05), and were more likely to have aortic valve calcification (18% *versus* 8%; p<0.05). Following adjustment for known risk factors (e.g., age, sex, baseline eGFR, diabetes mellitus, hypertension, smoking status, BMI), obstructive coronary artery disease (adjusted hazard ratio [aHR], 2.44 [95% CI 1.28-4.65, $P<0.01$), non-calcified plaque burden (aHR per doubling, 1.13 [95% CI 1.02-1.26], $P<0.05$), and low-attenuation plaque burden (aHR per doubling, 1.27 [95% CI 1.05-1.52], $P<0.05$), independently associated with the development of CKD. Coronary artery calcium score demonstrated a trend towards associating with the development of CKD (aHR per doubling, 1.05 [95% CI 0.99-1.12], $P=0.12$).

Conclusions

In a group of patients at-risk of developing CKD, CTCA metrics – specifically, obstructive coronary artery disease, non-calcified plaque burden, and low-attenuation plaque burden – independently associated with the development of CKD over 10 years of follow-up. This study illustrates the potential utility of CTCA in risk-stratifying patients for future CKD which might allow targeting of evidence-based cardioprotective and renoprotective therapies.

References

1. SCOT-HEART Investigators; Newby DE, Adamson PD, Berry C, Boon NA, Dweck MR, Flather M, Forbes J, Hunter A, Lewis S, MacLean S, Mills NL, Norrie J, Roditi G, Shah ASV, Timmis AD, van Beek EJR, Williams MC. Coronary CT Angiography and 5-Year Risk of Myocardial Infarction. N Engl J Med. 2018 Sep 6;379(10):924-933.

Poster number: 371

Submission number: 529

Effect of initiation and rapid maximisation of RAASi in patients with CKD and heart failure with reduced ejection fraction – observations from LIFT, an ongoing trial

Dr Mahrukh Ayesha Ali, Dr Ella Tumelty, Dr Isaac Chung, Dr Daniel Murphy, Dr Sabba Hussain, Dr Simran Singh Parmar, Dr Thomas McNally, Harsha Addada, Dr Lisa Anderson, Dr Irina Chis Ster, Prof Debasish Banerjee

St George's University of London, London

Dr Mahrukh Ayesha Ali

Biography
Dr Mahrukh Ayesha Ali - MBBS, MRCP, PG Cert Clin Med (University of Cambridge), MSc Experimental and Translational Immunology (UCL). Dr Ali is a renal trainee in London and currently undertaking research for MDRes/PhD at St George's University of London

Abstract

Introduction:

The use of renin-angiotensin-aldosterone inhibitors (RAASi) in heart failure patients reduces hospital admissions and mortality; however, this is limited in CKD patients by hyperkalaemia, and concerns of worsening renal function. Novel potassium binders like Lokelma (sodium zirconium cyclosilicate – SZC) can potentially allow clinicians to achieve optimal dosing of RAASi. The LIFT study (Lokelma for maximization of RAASi in patients with CKD and HF) is a phase III, randomised controlled trial to evaluate the effect of Lokelma in allowing initiation and maximization of RAASi in patients with CKD and HF with reduced ejection fraction on nil or sub-optimal RAASi. The trial is ongoing - here we present some pre-liminary data and the data remains blinded.

Methods:

The primary outcome is to assess the effect of Sodium Zirconium Cyclosilicate (ZS-9) and Placebo with respect to enabling patients to achieve the maximum (RAASi) dose while keeping K+ < 5.6 mmol/L. Secondary outcomes include the number and maximum doses of ACEi/ARBs (Angiotensin Converting Enzyme inhibitors/angiotensin receptor blockers) and MRA (mineralocorticoid receptor blockers) achieved during the study period. Other secondary outcomes include time since randomisation to first occurrence of hyperkalaemia (K+>5.5 mmol/L) and/or severe hyperkalaemia (K+>6.0), number of hospital admissions and duration of hospital admissions during the study.

Results:

We present some longitudinal preliminary data regarding the up-titration of RAASi achieved for the 59 patients who have completed the trial so far, having started with none or sub-optimal RAASi. The mean age of participants is 73 years (SD=7). Patients were followed up for a median of 74 days, minimum being 18 and maximum of 142 days (Q1=59, Q3=82). Of the 58 patients, 35 (60.3%) completed 7 study visits (of the total 7 study visits), 6 (10.3%) completed the study after 6 visits, 8 (13.8%) completed the trial after 5 visits, 6 (10.3%) completed their participation in 4 visits, 2 (3.5%) had a total of 3 visits and 1 (1.7%) completed the trial participation in 2 visits. The data exhibit unsurprising high variability as the results cannot be stratified by intervention arm at this moment.

Discussion:

The trial involves following patients over a maximum of 7 visits – on each visit, patients are assessed clinically focusing on blood pressure and biochemically (renal function and serum potassium), and the RAASi and MRA are uptitrated as tolerated. The partial pre-liminary analysis suggests a decline in eGFR, with a mean decline of 0.42 (95%CI (0.21-0.64)) mL/min/1.73m^2 per week over trial treatment period with the uptitration of RAASi and MRA doses over successive visits. This is in context of a frail, older population with multiple co-morbidities. Further analysis is needed to understand these effects across various clinical groups. The degree to which Lokelma enables RAASi maximisation in this population is yet to be determined after finishing the data collection and unblinding.

Figure 1: effect of medication up-titration during the study period on the eGFR
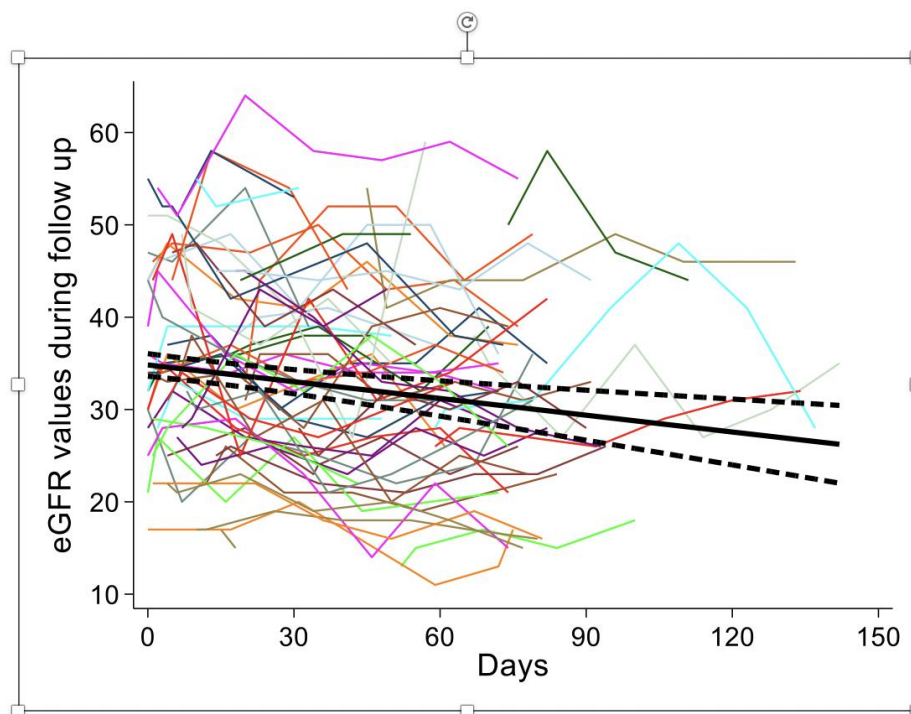
Study Registration Number

EudraCT number 2020-002946-18. Registered on 08 June 2020.

Poster number: 372

Submission number: 435

The impact of body composition measures on survival and cardiovascular events in patients with chronic kidney disease, insights from a large prospective cohort study

Dr Ashveer Randhay[1,2], Dr Daniela Viramontes Horner[1], Dr Richard Fluck[2], Professor Maarten Taal[1,2], Dr Tarek Eldehni[1,2]

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Dr Ashveer Randhay

Biography
Ashveer is a higher specialty trainee in Renal Medicine in the East Midlands deanery. He is currently out of programme working as a clinical research fellow in Centre for Kidney Research and Innovation, University of Nottingham. His clinical interests include body composition in patients with kidney disease, kidney transplantation and kidney health in pregnancy.

Abstract

Introduction

Multimorbidity, frailty and sarcopenia are increasingly prevalent in people with chronic kidney disease (CKD). Creatinine Muscle Index (CMI) has been proposed as a novel surrogate marker of muscle mass, and lower CMI was associated with frailty and increased mortality in the Atherosclerosis Risk in Community Study (1). Waist to hip ratio (WHR) has also been proposed as a surrogate marker of visceral adiposity. In order to investigate the impact of body composition on outcomes, we analysed data collected from a large CKD cohort using CMI and WHR as markers of muscle mass and adiposity respectively to examine their effects on 5-year survival and cardiovascular events.

Methods

1741 people with CKD stage 3 were recruited from 32 primary care practices. Cystatin C was measured using the Abbott c16000 Analyser (Abbott Diagnostics). eGFR cystatin (eGFR$_{cys}$) was calculated using the CKD-EPI Cystatin C Equation (2012). CMI was calculated as the product of serum creatinine and eGFR$_{cys}$ (CMI [mg/day per 1.73m^2]= eGFR$_{cys}$ [ml/min per 1.73m2] X serum creatinine [mg/dl] X 1 dl/100ml X 1440 min/day). Cox proportional hazard model was used to examine if CMI and WHR predicted death or cardiovascular events.

Results

Mean age of the participants was 72.9 ± 9 years. Mean $eGFR_{Cr}$ was 53.5 ± 11.8 ml/min/1.73m^2. Mean $eGFR_{cys}$ was 45.1 ± 16.0 ml/min/1.73m^2. Mean CMI was 766.45 ± 239.2 mg/day/1.73m^2. 300 (17.2%) participants died during 5 years of observation.

In a Cox proportional hazards model which included CMI, WHR and age, lower CMI per standard deviation change (B = -0.202, HR 0.817, p=0.007), higher WHR per standard deviation change (B = 0.313, HR 1.37, p<0.001) and age at baseline (B = 0.088, HR 1.09, p<0.001) were independent predictors of mortality at year 5 of follow-up. CMI per standard deviation change also predicted cardiovascular events at 5 years using a univariable cox proportional hazards model, (B = -0.095, HR 0.91, p =0.03).

Discussion

Lower CMI (a surrogate measure of muscle mass) and higher WHR (a surrogate for visceral adiposity) independently predicted 5 year mortality and cardiovascular events in this predominantly elderly population with CKD stage 3. We conclude that body composition has an important impact on mortality and cardiovascular events in patients with CKD and the mechanisms of this merits further investigation. This could inform future interventions that reduce visceral adiposity and improve muscle mass in people with CKD.

References

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Glomerulonephritis 2

Poster number: 373

Submission number: 385

Analysis of current real-world management of IgAN in five European countries

Philipp Csomor[1], Tucker Hurtado[2], Chris Dudzenski[2], Sam Mahmoudi[3], Charlotte Pollet[1]

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Philipp Csomor

Biography

Philipp Csomor is a Global Medical Affairs Lead at CSL Vifor in Glattbrugg, Switzerland. His academic background is in biology, having obtained his PhD in neuroscience/psychiatric research and MSc in biology studies (including biochemistry and neuroscience) from ETH Zurich, where he was also awarded the ETH medal for outstanding scientific research. Before joining the pharmaceutical industry in 2010, he held the position of Deputy Group Leader of the Neuropsychopharmacology and Brain Imaging Unit at the Psychiatric University Hospital Zurich. Within his role at CSL Vifor, Dr Csomor has co-authored several publications and has been heavily involved in a number of therapy areas, including secondary hyperparathyroidism and IgA nephropathy.

Abstract

Introduction:

Immunoglobulin A nephropathy (IgAN) is the most common primary glomerulonephritis worldwide. IgAN is often progressive and patients generally face a poor prognosis if not appropriately treated. Current treatments focus on disease management through optimised supportive care, including use of an angiotensin-converting enzyme inhibitor (ACEi) and/or angiotensin receptor blocker (ARB).[1] A physician questionnaire and patient chart review investigated real-world IgAN management in five European countries.

Methods:

Between 21 December 2022 and 6 February 2023, physicians from France, Germany, Italy, Spain and the UK completed a questionnaire on IgAN management and analysed charts from their centres. Included physicians spent >40% of their time in a clinical setting and were in practice 2–40 years. Physicians had ≥50 CKD stage 1–4 patients under their management, including ≥4 non-dialysis IgAN patients. Charts were from patients ≥12 years of age, diagnosed with IgAN and not on dialysis, with an estimated glomerular filtration rate (eGFR) ≥15 mL/min/1.73 m^2.

Results:

261 physicians answered the questionnaire and completed chart audits on 473 of their most recently seen patients. Charts included in the audit were predominantly from male (71%), Caucasian (78%) patients. The mean age of patients was 47 years and 76% were in CKD stage 3 or later. At referral, 66% of patients were receiving an ACEi and/or ARB, 21% were receiving another antihypertensive agent and 6% were taking a sodium-glucose cotransporter 2 inhibitor (SGLT2i). Most patients (88%) had undergone ≥1 kidney biopsy. At the initial biopsy, average eGFR was 51.0 mL/min/1.73 m^2 and proteinuria was 2.7 g/day. Of the biopsied patients, 73% had a mesangial hypercellularity (M), endocapillary hypercellularity (E), segmental glomerulosclerosis (S), tubular atrophy/interstitial fibrosis (T) and crescents (C) (MEST-C) score available. Due to biopsy results, 29% of patients initiated systemic steroids and 10% started an SGLT2i. On average, IgAN patients are prescribed five medications, with the number of medications increasing with age. 92% of patients were taking an ACEi and/or ARB at the most current visit; prescriptions with an ACEi and/or ARB included combination with an SGLT2i only (36%), with a systemic steroid only (10%), and with both an SGLT2i and a systemic steroid (5%). 41% of patients were prescribed an ACEi and/or ARB alone. An ACEi and/or ARB were considered first-line therapy by 81% of physicians. Systemic steroids and SGLT2is were largely thought of as later line treatment options. The majority of physicians (66%) believed that their patients were completely adherent to their treatment regimen. Notably, 35% of patients were on second-line therapy or later; drivers of treatment change included increased proteinuria (31%), decreased eGFR (26%) and side effect management (15%). 54% of physicians were not completely satisfied with their patients' overall response to treatment. Physicians anticipated that 74% of their patients would progress to dialysis.

Discussion:

Many physicians are not satisfied with current treatment options for IgAN, with increasing levels of proteinuria, eGFR decline and side effects driving treatment change. This study suggests that there is a need for more treatments to facilitate IgAN management, prevent disease progression and improve prognosis.

References

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Paired kidney biopsies from the AURORA 2 study of voclosporin in active lupus nephritis

Professor Samir Parikh[1], Dr Clint Abner[2], Dr Ernie Yap[2], Dr Krista Piper[2], Dr Robert Huizinga[3], Dr Henry Leher[2], Melanie Edwards[4]

[1]Ohio State University, Columbus. [2]Aurinia Pharmaceuticals Inc, Edmonton. [3]Reformation Consulting Services, North Saanich. [4]Otsuka Pharmaceuticals UK Ltd, Windsor

Professor Samir Parikh

Biography
Samir V. Parikh, MD, FASN, is an Associate Professor of Medicine in the Division of Nephrology at The Ohio State University in Columbus, where he specializes in adult nephrology. He graduated medical school from the University of Cincinnati College of Medicine in 2006, followed by a residency and fellowship at The Ohio State University Wexner Medical Center. Dr. Parikh joined The Ohio State University faculty in 2011. Dr. Parikh is a clinician, translational researcher, and clinical trialist focused on improving the management of and outcomes for patients with glomerular disorders and thrombotic microangiopathies. His research is focused on uncovering novel biomarkers of disease and optimizing the use of kidney biopsy to inform management decisions in kidney diseases. He is the author of several manuscripts and has been the principal investigator for numerous clinical trials of novel therapeutics for glomerular disease such as lupus nephritis.

Abstract

Background/Purpose

Voclosporin is approved for the treatment of adults with active lupus nephritis. Addition of voclosporin to mycophenolate mofetil (MMF) and low-dose glucocorticoids in the Phase 3 global AURORA 1 and AURORA 2 studies led to significantly earlier and greater reductions in proteinuria and an improved estimated glomerular filtration rate (eGFR) slope over time. To characterize the long-term renal impact of voclosporin at the histologic level, we analyzed paired kidney biopsies from a subset of patients in these studies.

Methods

Patients in AURORA 1 had biopsy-proven lupus nephritis, urine protein creatinine ratio (UPCR) ≥1.5 g/g (≥2 g/g for Class V), and estimated glomerular filtration rate (eGFR) >45 mL/min/1.73 m^2. Patients were randomized to voclosporin or control for 1 year in AURORA 1 and continued the same blinded therapy for 2 additional years in AURORA 2; all patients received MMF and low-dose glucocorticoids. A subset of patients had a kidney biopsy prior to screening and a repeat biopsy after approximately 18-months of therapy. Histopathologic grading according to National Institutes of Health indices for lupus nephritis

activity and chronicity was conducted by Arkana Laboratories. Efficacy outcomes and measures of renal function over time, including eGFR were assessed.

Results

Paired biopsy samples were collected from sixteen patients in the voclosporin arm and ten patients in the control arm. Baseline mean activity scores were similar between arms, with scores improving with treatment in both arms (Table 1). Mean chronicity scores were also similar between arms at baseline and remained stable over time in most patients. Measures of renal function remained stable in both arms over the 3-year follow-up. Voclosporin-treated patients had numerically greater mean reductions from baseline in UPCR year-on-year compared to patients in the control arm, although the difference was not statistically significant.

Conclusion

As expected, mean activity scores improved in both treatment arms. Importantly, exposure to voclosporin was not associated with chronic injury, with the mean index remaining stable at follow-up. Similar to the overall population, patients treated with voclosporin saw greater reductions in UPCR over 3 years of treatment; safety outcomes from this small subgroup were also consistent with outcomes in AURORA 1. Multiplex immunohistochemistry and sequencing data will further illuminate the cellular and molecular underpinnings of disease and response to treatment.

Table 1. Laboratory parameters, clinical outcomes, and activity and chronicity index scores over time

	Voclosporin n=16		Control n=10	
	Baseline	**Month 36**	**Baseline**	**Month 36**
CRR, % (n/n)	-	62.5% (10/16)	-	40.0% (4/10)
PRR, % (n/n)	-	81.3% (13/16)	-	70.0% (7/10)
UPCR, mean (SD) g/g	4.59 (2.5)	0.99 (1.4)	4.71 (2.6)	2.1 (4.6)
eGFR, mean (SD), mL/min/1.73 m^2	80.3 (16.4)	82.7 (15.4)	82.6 (12.3)	85.8 (13.3)
Urine protein, mean (SD) mg/dL	413.7 (277.2)	135.7 (264.0)	350.2 (234.1)	128.0 (284.7)
Magnesium, mean (SD) mg/dL	2.0 (0.1)	2.0 (0.2)	2.1 (0.1)	2.1 (0.2)
Potassium, mean (SD) mmol/L	4.0 (0.3)	4.3 (0.2)	3.9 (0.4)	4.1 (0.5)
Glucose, mean (SD) mg/dL	84.4 (9.0)	93.5 (7.9)	93.5 (38.5)	89.1 (15.3)
Creatinine, mean (SD) mg/dL	0.8 (0.3)	0.8 (0.4)	0.8 (0.2)	0.8 (0.3)
Systolic BP, mean (SD) mmHg	121.7 (9.05)	118.3 (10.4)	121.1 (14.9)	110.8 (4.8)
Diastolic BP, mean (SD) mmHg	79.6 (8.7)	74.7 (7.7)	80.4	76.9 (4.5)
Histology	**Baseline**	**Follow-up**	**Baseline**	**Follow-up**
Activity Index, mean (SD)	1.8 (3.0)	0.4 (1.0)	2.8 (3.2)	0.4 (1.0)
Chronicity Index, mean (SD)	3.8 (3.5)	4.1 (3.3)	2.9 (2.3)	2.8 (2.7)

Renal function assessed with corrected eGFR (Chronic Kidney Disease Epidemiology Collaboration equation) using a prespecified ceiling of 90 mL/min/1.73 m^2. Histopathologic grading based on the National Institutes of Health indices for lupus nephritis activity (scale 0-24) and chronicity (scale 0-12). BP, blood pressure; CRR, complete renal response (UPCR ≤0.5 g/g, stable eGFR > 60 mL/min/1.73 m2, low-dose steroids, and no rescue medication); eGFR, estimated glomerular filtration rate; PRR, partial renal response (>50% reduction from baseline in UPCR); SD, standard deviation; UPCR, urine protein creatinine ratio.

Study Registration Number

AURORA 1, NCT03021499; AURORA 2, NCT03597464

Poster number: 375

Submission number: 194

Long-term safety and efficacy of voclosporin in black patients with lupus nephritis: Results from the AURORA 1 and AURORA 2 studies

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Dr Gabriel Contreras

Biography

Gabriel Contreras, MD, MPH, is a nephrologist in Miami, Florida, specializing in adult nephrology. He graduated from Autonomous University of Guadalajara Faculty of Medicine in Guadalajara, Mexico, followed by a residency in Internal Medicine at Harlem Hospital Center of Columbia University in New York City and fellowships in both Nephrology and Critical Care Medicine at Jackson Memorial Hospital in Miami, Florida. Dr. Contreras joined the Department of Medicine at the University of Miami in 1996, where he has since developed a successful clinical research program in the Division of Nephrology with the accrual of 24 research grants and more than 100 publications in peer review journals and textbooks. He has an ongoing commitment to improving kidney disease outcomes among racial and ethnic minorities.

Abstract

Background/Purpose

Black patients with lupus nephritis (LN) are reported to have more severe disease, are often refractory to treatment, and have worse long-term outcomes. Voclosporin in conjunction with low-dose glucocorticoids and mycophenolate mofetil (MMF) has shown significant benefit across ancestries and classes of LN. Here we report outcomes from up to three years of follow-up in patients identifying as Black and treated with voclosporin during the global Phase 3 AURORA studies.

Methods

Key inclusion criteria for the parent AURORA 1 study included biopsy-proven LN, urine protein creatinine ratio (UPCR) ≥1.5 g/g (≥2 g/g for Class V) and estimated glomerular filtration rate (eGFR) >45 mL/min/1.73 m^2. Patients completing AURORA 1 were eligible to enter the AURORA 2 continuation study on the same blinded therapy of voclosporin or placebo in combination with MMF and glucocorticoids for an additional two years. Programmed complete renal response (CRR; UPCR ≤0.5 g/g, stable eGFR, low-dose steroids, and no rescue medication), partial renal response (PRR; reduction in UPCR of ≥50% from baseline) and safety were assessed in patients self-identifying as Black or mixed Black.

Results

Twenty-six of 179 (14.5%) and 19 of 178 (10.6%) patients identified as Black or mixed Black in the voclosporin and control arms of AURORA 1. Baseline characteristics were similar between arms. Complete renal response rates at one year numerically favored voclosporin (46.2% vs 15.8%, Odds Ratio [OR] 3.92 [CI 0.95, >9.99] p=0.0597) as did PRR rates (69.2% vs 47.4%, OR 2.62 [CI 0.72, 9.45] p=0.1422).

Eighteen voclosporin-treated patients and seven control-treated patients in the Black subgroup continued into AURORA 2. Response rates at three years continued to numerically favor voclosporin (CRR, 44.4% vs. 14.3%, OR 4.17 [CI 0.41, >9.99] p=0.2276; PRR, 66.7% vs. 42.9%; OR 1.67 [CI 0.23, >9.99] p=0.6094). Greater reductions in mean UPCR were observed over the three-year period in the voclosporin arm (change from baseline -3.4 vs -1.5 g/g, p=0.0349). Mean eGFR levels remained stable and in the normal range over three years of treatment.

Conclusion

Black patients treated with a voclosporin-based regimen achieved higher rates of renal response than patients treated with MMF and glucocorticoids alone. For patients entering the continuation study, the response was largely durable for up to 3 years.

Study Registration Number

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Efficacy and safety of voclosporin in patients with proteinuria > 2 g/g

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Dr Emily Littlejohn

Biography
Emily Littlejohn, DO, MPH, attended medical school at Western University College of Osteopathic Medicine of the Pacific (COMP) where she was awarded a research fellowship in the Department of Biotechnology. She completed a residency in Internal Medicine at Loyola University Medical Center in Chicago, IL, and a fellowship in Rheumatology at the University of Michigan where she worked closely with lupus patients. Dr. Littlejohn joined the medical staff in the Department of Rheumatic and Immunologic Diseases at Cleveland Clinic in 2017 and holds a faculty position of Clinical Assistant Professor in the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University. She directs the Cleveland Clinic Lupus Cohort (CCLC), a longitudinal bio repository that banks blood and urine of lupus patients and is co-director of the Lupus Clinic.

Abstract

Background/Purpose

Proteinuria is the most common manifestation of lupus nephritis and is a mediator of progressive kidney damage. Early reductions in urine protein creatinine ratio (UPCR) have shown to be predictive of improved long-term outcomes in LN. However, recent studies with monoclonal antibody therapies have demonstrated a lack of efficacy in patients with moderate to high proteinuria (UPCR ≥2 to ≥3 g/g), potentially due to an increase in renal excretion of drug. In a pooled analysis of the Phase 2 AURA-LV and Phase 3 AURORA 1 studies, the addition of voclosporin to mycophenolate mofetil (MMF) and low-dose glucocorticoids resulted in earlier and greater reductions in proteinuria, regardless of baseline demographics or disease characteristics. To further characterize the efficacy and safety of voclosporin in patients with moderate to high proteinuria, we have analyzed outcomes in patients with UPCR ≥2 g/g using the pooled dataset.

Methods

Both studies enrolled patients with biopsy-proven LN (Class III, IV, or V ± III/IV) within 6 months (or up to 2 years in AURORA 1) and proteinuria ≥1.5 g/g (≥2 g/g for Class V). Patients were randomized to voclosporin (23.7 mg BID) or placebo and treated for up to one year (48 weeks [AURA-LV], 52 weeks [AURORA 1]); all patients received MMF and low-dose glucocorticoids. For this post hoc analysis,

complete renal response (CRR) rates were evaluated in patients with baseline UPCR ≥2 g/g. Complete renal response was defined as UPCR ≤0.5 g/g with stable renal function, low-dose steroids, and no rescue medication; partial renal response (PRR) was defined as a ≥50% reduction in UPCR from baseline. Adverse events (AEs) and measures of renal function were also assessed.

Results

Of the 268 and 266 patients included in the voclosporin and control arms of the pooled analysis, 217 and 215 patients had a baseline UPCR ≥2 g/g (mean [SD], 5.2 [3.4] vs. 4.6 [2.9] g/g). At one year, the change from baseline in least squares (LS) mean UPCR was significantly greater in the voclosporin arm (p=0.0003). A significantly greater percentage of voclosporin-treated patients achieved CRR at one year compared to the control arm (41.0% vs. 21.9%; odds ratio [OR] 2.48, p< 0.0001; Figure 1). Significantly more patients in the voclosporin arm (69.6%) than control arm (50.0%) achieved a PRR at one year (OR 2.3, p< 0.0001). Similar rates of AEs were reported in both arms. Measures of renal function, including mean eGFR, were similar and stable over one year of treatment (Figure 2, Table 1).

Conclusion

Consistent with results from the overall pooled study population, patients with UPCR ≥2 g/g treated with voclosporin achieved significantly higher renal response rates than patients treated with MMF and low-dose glucocorticoids alone while renal function in both arms remained comparable. This is clinically relevant given the lack of safe and effective therapies for patients with high proteinuria.

Figure 1. Complete Renal Response at One Year

	Number in subgroup (%)	Odds ratio for CRR (95% CI)	p value
Sex			
Male	59 (13.7)	2.1 (0.7-6.1)	0.1911
Female	373 (86.3)	2.6 (1.6-4.1)	<0.0001
Age (years)			
≤30	218 (50.5)	2.2 (1.2-4.0)	0.0104
>30	214 (49.5)	2.8 (1.6-5.2)	0.0007
Race			
White	158 (36.6)	1.7 (0.9-3.3)	0.1190
Asian	161 (37.3)	3.0 (1.5-6.1)	0.0027
Black (inc mixed Black)	44 (10.2)	5.7 (1.1-30.9)	0.0418
Other (inc mixed race)*	69 (16.0)	3.2 (1.0-9.9)	0.0493
Ethnicity			
Hispanic or Latino	111 (25.7)	2.0 (0.8-4.8)	0.1313
Non-Hispanic or non-Latino	321 (74.3)	2.6 (1.6-4.3)	<0.0001
Biopsy class**			
Pure class III	53 (12.3)	5.1 (1.4-18.2)	0.0126
Pure class IV	210 (48.6)	2.6 (1.4-4.7)	0.0019
Pure class V	67 (15.5)	1.1 (0.4-3.3)	0.8105
Mixed class V and III or IV	100 (23.1)	2.8 (1.1-7.3)	0.0306
Baseline eGFR (mL/min/1.73 m^2)			
<60	70 (16.2)	1.8 (0.5-5.9)	0.3650
≥60 and <90	130 (30.1)	2.4 (1.1-5.2)	0.0296
≥90	232 (53.7)	2.8 (1.6-5.0)	0.0003
Overall	432 (100.0)	2.7 (1.7-4.2)	<0.0001

*Other races includes other or mixed races except Black race

**Two patients with Mixed Class III/IV and Mixed Class II/V disease are not included in the biopsy class subgroup analysis but are included in all other subgroup analyses and the overall analysis.

Post hoc analysis of patients with baseline UPCR ≥2 g/g includes pooled data from the 23.7 mg BID voclosporin arms and control arms in AURA-LV and AURORA 1. Analysis includes data from up to 48 weeks in AURA-LV and up to 52 weeks in AURORA 1. Complete renal response defined as UPCR of ≤0.5 g/g, eGFR ≥60 mL/min/1.73 m^2, or no decrease >20% from baseline, low-dose glucocorticoids, and no rescue medications. Odds ratio (OR) >1 demonstrates treatment benefit of voclosporin. CRR, complete renal response; estimated glomerular filtration rate; SD, standard deviation; UPCR, urine protein creatinine ratio.

Figure 2. LS Mean eGFR over Time
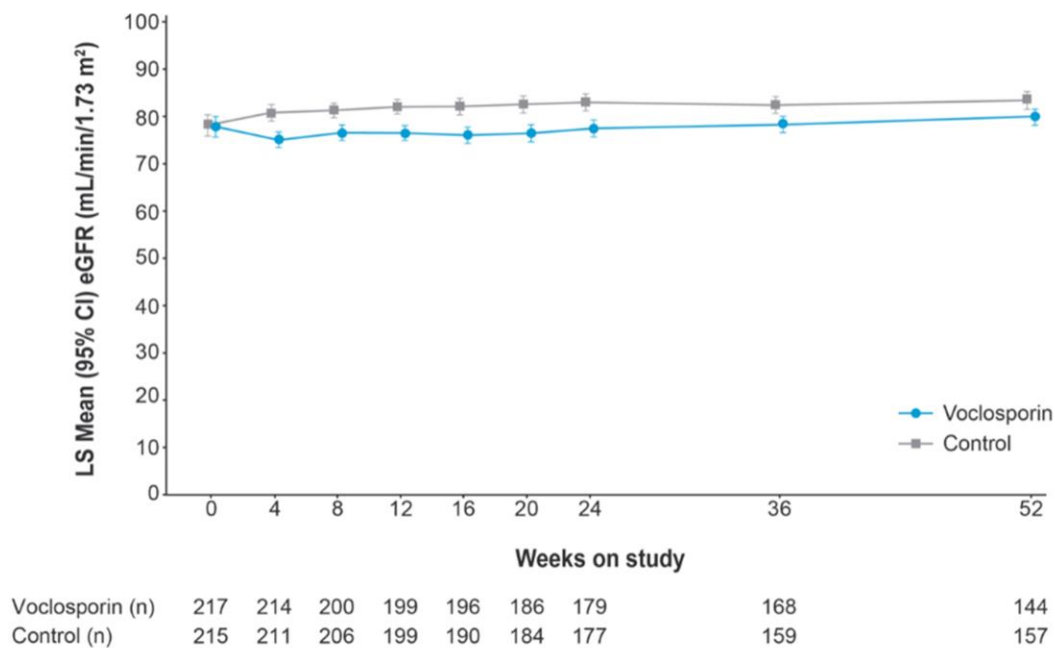
Voclosporin (n)	217	214	200	199	196	186	179	168	144
Control (n)	215	211	206	199	190	184	177	159	157

Post hoc analysis of patients with baseline UPCR ≥2 g/g includes pooled data from the 23.7 mg BID voclosporin arms and control arms of AURA-LV and AURORA 1. Data include up to 48 weeks from AURA-LV and up to 52 weeks from AURORA 1. Renal function was assessed with corrected eGFR (Chronic Kidney Disease Epidemiology Collaboration equation) using a prespecified ceiling of 90 mL/min/1.73 m². CI, confidence interval; eGFR, estimated glomerular filtration rate; LS Mean, least squares mean.

Table 1. Laboratory Parameters over Time

	Voclosporin n=217		Control n=215	
	Baseline	One Year	Baseline	One Year
Systolic BP, mean (SD) mmHg	126.0 (15.6)	120.0 (11.9)	125.8 (15.6)	118.2 (13.4)
Diastolic BP, mean (SD) mmHg	84.1 (11.3)	78.3 (8.8)	82.3 (11.6)	77.1 (10.4)
eGFR, mean (SD), mL/min/1.73 m²	77.7 (16.0)	79.8 (15.5)	78.0 (15.8)	83.1 (13.1)
UPCR, g/g	5.2 (3.4)	1.0 (1.7)	4.6 (2.9)	1.7 (1.9)
Magnesium, mean (SD) mg/dL	2.1 (0.2)	2.0 (0.2)	2.0 (0.2)	2.1 (0.2)
Potassium, mean (SD) mmol/L	4.1 (0.6)	4.2 (0.4)	4.0 (0.6)	3.9 (0.4)
Glucose, mean (SD) mg/dL	85.5 (24.6)	87.7 (21.3)	87.6 (37.5)	85.8 (11.8)
Creatinine, mean (SD) mg/dL	0.8 (0.3)	0.9 (0.3)	0.8 (0.3)	0.7 (0.3)

Post hoc analysis of patients with baseline UPCR ≥2 g/g includes pooled data from the 23.7 mg BID voclosporin arms and control arms of AURA-LV and AURORA 1. Data include up to 48 weeks from AURA-LV and up to 52 weeks from AURORA 1. Renal function assessed with corrected eGFR (Chronic Kidney Disease Epidemiology Collaboration equation) using a prespecified ceiling of 90 mL/min/1.73 m². BP, blood pressure; eGFR, estimated glomerular filtration rate; SD, standard deviation, UPCR, urine protein creatinine ratio.

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Comparison of dual-immunosuppressive therapy and a voclosporin-based, triple-immunosuppressive regimen for lupus nephritis: A propensity analysis of ALMS and AURORA 1

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Dr Ernie Yap

Biography

Ernie Yap, MD, is a Nephrologist and Medical Director in the Medical Affairs at Aurinia Pharmaceuticals Inc. since 2022. Previously, Dr. Yap was a Clinical Assistant Professor of Medicine and board-certified Clinical Nephrologist at the State University of New York (SUNY) Downstate Medical Center, New York. Dr. Yap attended medical school at Dalhousie University, Canada. He did his residency in Internal Medicine at the New York Presbyterian Hospital and fellowship in Nephrology at the State University of New York Downstate Health Sciences University in Brooklyn, New York.

Abstract

Background

To understand the safety and efficacy of a voclosporin-based, mycophenolate mofetil (MMF) and glucocorticoid-sparing, triple immunosuppressive regimen as an initial approach to therapy in active lupus nephritis compared to conventional high-dose MMF and glucocorticoid regimens, we compared and analyzed clinical data in propensity-matched patients from ALMS and AURORA 1. We hypothesized that a voclosporin-based, triple immunotherapy approach would reduce exposure to toxicities associated with glucocorticoids and MMF, resulting in an improved safety profile without compromising efficacy.

Methods

Both studies enrolled participants with active lupus nephritis. In ALMS, MMF was dosed to a target of 3 g/day with oral glucocorticoids initiated at a maximum dose of 60 mg/day and tapered every 2 weeks to 10 mg/day. In AURORA 1, participants received voclosporin 23.7 mg BID in combination with MMF at a target dose 2 g/day and oral glucocorticoids started at 25 mg/day and tapered to 2.5 mg/day by Week 16. Propensity matching generated 2 groups of matched patients based on demographic and disease characteristics. Safety and efficacy outcomes were assessed at 3 and 6 months.

Results

Propensity matching identified 96 pairs of participants with similar demographics and baseline disease characteristics. At 3 and 6 months, MMF and glucocorticoid exposure was more than 2- fold higher in ALMS than AURORA 1. Overall, fewer adverse events (AE) were observed in AURORA 1 across the majority of organ systems, including gastrointestinal, skin and subcutaneous tissues, endocrine, and psychiatric disorders, although more patients in AURORA 1 were reported to experience eGFR decrease; most reductions in eGFR were manageable by dose modification. The incidence of serious AEs was similar in both groups at 3 and 6 months. In the first 3 months, significantly more patients in AURORA 1 achieved >25% UPCR reduction from baseline (81.3% AURORA 1, 65.6% ALMS; p=0.011); the proportions of patients achieving UPCR ≤0.5 mg/mg and >50% UPCR reduction from baseline were numerically greater in the voclosporin arm; the differences were not statistically significant.

Conclusion

The above findings affirm the KDIGO 2023 recommendation that a voclosporin-based, triple immunotherapy regimen should be considered as initial therapy in active lupus nephritis.

Table 1. Treatment Exposure and Safety Outcomes

	3 Months		6 Months	
	ALMS N=96	AURORA 1 N=96	ALMS N=96	AURORA 1 N=96
Glucocorticoid and MMF Exposure				
Glucocorticoid daily dose, mg Mean (SD)	21.81 (5.8)	6.13 (3.7)	10.12 (2.8)	5.08 (11.2)
Cumulative glucocorticoid exposure, mg Mean (SD)	2849.8 (544.6)	1104.9 (142.8)	3818.5 (777.5)	1502.3 (410.0)
MMF daily dose, mg Mean (SD)	2.8 (0.55)	1.9 (0.5)	2.8 (0.4)	1.9 (0.6)
Cumulative MMF exposure, mg Mean (SD)	209.8 (45.2)	161.8 (33.5)	414.3 (117.9)	322.0 (74.3)
Adverse Events (AE), n (%)				
Any AE	89 (92.7)	81 (84.4)	92 (95.8)	88 (91.7)
Serious AE (SAE)	18 (18.8)	13 (13.5)	22 (22.9)	18 (18.8)
Treatment-related SAE	9 (9.4)	4 (4.2)	11 (11.5)	6 (6.3)
Disease-related AE	55 (57.3)	35 (36.5)	63 (65.6)	44 (45.8)
AE leading to study drug discontinuation	7 (7.3)	4 (4.2)	10 (10.4)	7 (7.3)
Fatal AE	3 (3.1)	0 (0.0)	3 (3.1)	0 (0.0)
Select AEs by System Organ Class, n (%)				
Infections and infestations	57 (59.4)	45 (46.9)	69 (71.9)	60 (62.5)
Serious Infections and infestations	9 (9.4)	7 (7.3)	12 (12.5)	8 (8.3)
Gastrointestinal disorders	49 (51.0)	30 (31.3)	57 (59.4)	38 (39.6)
Musculoskeletal/connective tissue disorders	38 (39.6)	17 (17.7)	45 (46.9)	22 (22.9)
Skin and subcutaneous disorders	30 (31.3)	17 (17.7)	41 (42.7)	22 (22.9)
Renal/urinary disorders	6 (6.3)	8 (8.3)	11 (11.5)	11 (11.5)
Psychiatric disorders	16 (16.7)	2 (2.1)	16 (16.7)	4 (4.2)
Select AEs by Preferred Term, n (%)				
GFR decreased	0	16 (16.7)	0	20 (20.8)
Hypertension	11 (11.5)	14 (14.6)	14 (14.6)	16 (16.7)
Hyperglycemia	5 (5.2)	0	5 (5.2)	0
Cushingoid/Cushing's syndrome	8 (8.3)	0	8 (8.3)	0

Based on data from 96 patients from ALMS and AURORA 1 matched using propensity scoring. Adverse events occurred on or after the first dose of study drug up to either 3 or 6 months of treatment. Adverse events are coded using MedDRA v 9.1 (ALMS) and v20.0 (AURORA 1). MMF, mycophenolate mofetil; SD, standard deviation.

Table 2. Efficacy Outcomes at 3 and 6 Months

	ALMS N=96	AURORA 1 N=96
At 3 Months		
UPCR reduction >25%, n (%)	63 (65.6)	78 (81.3)
OR (95% CI) vs MMF, p-value	2.50 (1.23, 5.08) 0.0110	
At 6 Months		
UPCR ≤0.5 mg/mg, n (%)	25 (26.0)	36 (37.5)
OR (95% CI) vs MMF, p-value	1.85 (0.94, 3.65) 0.0752	
UPCR reduction >50%, n (%)	61 (63.5)	69 (71.9)
OR (95% CI) vs MMF, p-value	1.54 (0.8, 2.95) 0.1956	

Based on data from 96 patients from ALMS and AURORA 1 matched using propensity scoring.

CI, confidence interval; MMF, mycophenolate mofetil; OR, odds ratio; UPCR, urine protein creatinine ratio.

Progression of kidney disease in patients with ANCA-associated vasculitis

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Ailish Nimmo

Biography
I am a renal ST7 and SCREDS clinical lecturer in Edinburgh. I'm interested in epidemiology, the use of routine healthcare data, and kidney transplantation.

Abstract

Introduction

Kidney involvement in ANCA-associated vasculitis (AAV) is common and a poor prognostic indicator for patient outcomes. Predicting kidney outcomes in these patients remains challenging. Whilst risk scores have been developed which incorporate clinical and pathological variables at disease presentation, these do not consider patients' clinical and pathological responses to treatment. Here, we describe the progression of kidney disease in a cohort of patients with AAV and kidney involvement.

Methods

This was a study of patients with AAV within South East Scotland. Patients were identified from the local AAV database and Scottish Renal Biopsy Registry. Demographic and clinical data comprising measures of serum creatinine, proteinuria, and ANCA titres following diagnosis, alongside kidney biopsy results, comorbidities, and AAV relapses were extracted from the local renal database. Glomerular filtration rate was estimated using the 2021 CKD-EPI formula. Progression of kidney disease was defined as change in eGFR over time and accounted for the effects of relapse.

Results

Three hundred and four patients with AAV and kidney involvement were diagnosed between May 2002 and December 2022. Median age at presentation was 65 years [IQR 54.8-74.5] and 53% were male; 98% were of White ethnicity. One hundred and fifty-nine patients (52%) were MPO ANCA-positive, 129 (43%) PR3-positive, and 16 (5%) were ANCA negative. Two hundred and sixty-two patients (86%) had a kidney biopsy. Regarding comorbidity, 229 patients (75%) had hypertension, 80 (26%) had a prior cardiovascular event, 31 (10%) had diabetes, and 34 (11%) had a history of malignancy. Median follow up time was 4.2 years [1.7-8.4].

At presentation, median eGFR was 29.9 ml/min/1.73m^2 and median albumin to creatinine ratio (ACR) was 38.9 mg/mmol [10.1-96.5]; 50% of patients presented with CKD stage 4 or 5. Remission was achieved in 295 patients (97%), with a median remission eGFR of 44.1 ml/min/1.73m^2 [28.1-65.0]. Based on remission eGFR and ACR, the median 2- and 5-year kidney failure risk equation scores were 0.9% [0.0-6.0] and 3.2% [0.1-19.8], respectively. Kidney replacement therapy (KRT) for acute kidney injury was required in 41 patients (13%), though 22 patients (54%) recovered independent kidney function within 3 months and a further 5 (12%) beyond 3 months. During follow up, 37 patients reached kidney failure of whom 24 received KRT and 13 were managed conservatively.

From remission, 246 patients had $\geq$1 year of follow up and 209 patients had $\geq$2 years follow up. The median change in eGFR from remission to 1 year was +2.8 ml/min/1.73m^2 [-2.9 – 9.4] and to 2 years was +5.0 ml/min/1.73m^2 [-4.0 – 13.2].

Sixty-nine patients had at least 1 disease relapse during follow up; 26 patients (38%) had a renal relapse. In patients with a renal relapse, median eGFR at relapse was 42.9 ml/min/1.73m^2 [24.5-58.1], with a median change in eGFR from relapse to 1 year of +12.4ml/min/1.73m^2 [1.5 – 21.4] and to 2 years +8.4ml/min/1.73m^2 [0.9 – 14.0].

Discussion

This is the first study to examine the progression of kidney disease in patients with AAV and kidney involvement. Over half of patients continue to gain kidney function during the first 2 years following diagnosis, including in those who suffer a relapse. The incidence of kidney failure in our cohort was low. Future work will define those patients with AAV at particular risk of kidney disease progression and how this might help planning for kidney failure in this patient group.

Safety of SGLT2 inhibitors in immunosuppressed renal patients; A Single centre experience

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Dr Mya Hmun

Biography
I was born in Burma in 1992. I was educated in Yangon, matriculated in 2008 with distinctions in five subjects and won the scholarship. I studied medicine in the University of Medicine 1, Yangon. I gained distinction in Microbiology. I completed internship training in the teaching hospitals in Yangon, then graduated in 2015. I migrated to UK in 2016 after passing PLAB exam. I started working in the NHS since 2016 as a senior house officer, then completed core medical training in the east of England deanery before starting renal specialty training in the North London deanery. I passed MRCP exam in 2019 and worked as a medical registrar in Southend University Hospital and as a renal registrar in the Royal London Hospital. I am now a renal specialty registrar at the Royal Free Hospital, affiliated with University College London. As part of the North London training, I was appointed as a clinical lecturer in the Royal Free Hospital in the department of renal medicine. In addition to clinical work, I am involved in the research project, organising local renal registrar teaching and weekly journal club meetings. I recently passed the European Specialty exam in Nephrology.

Abstract

Introduction:

SGLT2 inhibitors were initially developed to treat T2DM, via their mechanism of inducing glycosyuria. Large randomised controlled trials including DAPA-CKD, EMPA-KIDENY, CREDENCE have demonstrated the beneficial effects of SGLT2 inhibitors in lowering the risk of progression of proteinuric CKD and death from renal and cardiovascular causes, with adverse effects of UTI, DKA and vascular disease noted in those with DM. UKKA guidelines recommended the initiation of SGLT2 inhibition in patients with eGFR 25-60ml/min/1.73m2, uACR >25mg/mmol attributable to diabetic or non-diabetic renal causes and established coronary disease or stable symptomatic heart failure but excluding the patients with polycystic kidney disease, immunological renal diseases and immunosuppressed state, as no data is currently available on these cohorts. The perceived risks for their use in immunocompromised populations, are the risks of infections specifically UTI. In this study, the safety profile of SGLT2 inhibitors in immunosuppressed renal patients was reviewed.

Methods:

From June 2019 to October 2023, a total of 61 patients were included in retrospective analysis with confirmed diagnosis of small vessel vasculitis (n=15 including IgA vasculitis, ANCA associated vasculitis, anti-GBM disease, cryoglobulinaemic vasculitis), lupus nephritis (n=11), IgA nephropathy (n=3), MPGN (n=1), C3 glomerulonephritis (n=1), membranous nephropathy (n=9), FSGS (n=8), minimal change (n=8), IgG4 disease(n=4), sarcoidosis (n=1).

All patients were above the age of 18 years using SGLT2 inhibitors for at least 3months and immunosuppressive agents either monotherapy or in combination of 2 or more agents (prednisolone, calcineurin inhibitors, mycophenolate mofetil, azathioprine, cyclophosphamide, rituximab) for at least 6 months. We excluded patients with T1DM, kidney transplants, and those receiving prednisolone monotherapy at a dose less than 5mg per day.

Results:

A total 13 episodes of non-fatal infection were identified in 10 out of 61 patients (16.3%): chest infection (7 episodes), UTI (2 episodes), ear infection (1 episode), cellulitis (3 episodes). 1 patient developed pneumonia and required hospitalisation following rituximab infusion whilst on co-trimoxazole prophylaxis.

Out of 10 patients who had infective complications, 7 patients (70%) had T2DM. 2 patients were on insulin therapy, 6 patients had poorly controlled diabetes. DKA, fungal infections, amputation, fractures, death were not reported during this period.

Discussion:

The collaborative meta-analysis of large, randomised placebo-controlled trials of SGLT2 inhibitors showed that treatment for one-year of 1000 patients with CKD and diabetes with SGLT2 inhibitor was estimated to cause around one episode of ketoacidosis and one episode of lower limb amputation. EMPA-KIDNEY and CREDENCE trials demonstrated the similar incidences of UTI, genital infection, bone fractures across SGLT2 inhibitors and placebo groups. The side effect profile of SGLT2 inhibitors was extremely limited compared to their beneficial outcomes. Data from EUVAS ANCA vasculitis studies showed that 24% of vasculitis patients developed infective complications accounting for 20% of death during 1-2 years of follow up. Our data did not demonstrate an increased infectious risk or death in those treated with SGLT2 inhibitors compared to historical immunosuppressed populations. However, the infectious complications were higher in immunosuppressed poorly controlled diabetics compared to non-diabetics highlighting the importance of diabetic control to reduce the risk of infection. In conclusion, SGLT2 inhibitors can safely be used to reduce the progression of CKD in immunosuppressed proteinuric CKD without significantly causing harmful adverse events. Large meta-analyses of such cohorts are needed as randomised trials may not be forthcoming.

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Investigating the impact of Anti-IL5 therapy in eosinophilic granulomatosis with polyangiitis (EGPA); a longitudinal perspective for three years and beyond

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Dr Allyson C. Egan

Biography
Dr Allyson Egan is a Consultant Nephrologist, with a specialist interest in autoimmunity.

Abstract

Introduction

In the randomized, placebo-controlled MIRRA trial[1] for relapsing and refractory eosinophilic granulomatosis with polyangiitis (EGPA), adjuvant therapy with 300mg anti-IL5 mAB Mepolizumab [MEPO] for 12 months (M), accrued longer times in remission, reduced steroid exposure and reduced relapse rates[1]. The aim of this study is to analyze the outcome of 100mg MEPO monthly s/c for a minimum of 36 months. Changes to adjuvant immunosuppression and indications for anti-IL5 class switch from MEPO 100mg s/c to Benralizumab (BRZ) or Reslizumab (Res) were assessed.

Methods

In this observational study, 20 EGPA patients received anti-IL5 therapy for a minimum of 36M (range 49-68M). All commenced on 100mg s/c MEPO every four weeks. Anti-IL5 therapy switched to BRZ or Res due to partial response or intolerance. Assessment time points included MEPO commencement, 6, 12, 18, 24 and 36 months.

Results

Overall, there was a 50% reduction in steroid dose by 12 months. This continued to reduce to 24M, by which time 2 were off steroids and a further 10/20 (50%) on weaning dose ≤ prednisolone 5mg/day. Mean steroid dose continued to decrease to 36 months. The number on adjuvant conventional immunosuppressants (ACIS), reduced over time from 10/20 (50%) at M0 to 4/20 (20%) by M24. Clinical benefits included ANCA serology normalized in all four positive patients by 12 months. Mean eosinophil count reduced from 0.42mg ±0.33 $X10^9$/L at M0 to 0.04±0.03 $X10^9$/L at 12 and 24M. BVAS reduced from median 5 [3-7], to 0 [0-1] by 24M. The change in mean FEV1 over 12 months was from (M0) 2.11±0.66 to (M12) 2.39±0.62 and FVC (M0) 3.42±0.87 to (M12) 3.67±0.93/105.60±20.47 respectively.

All 20 EGPA patients receiving anti -IL5 therapy, ranging from 49-68M remain on therapy. At 36M, 9 have remained on 100mg s/c MEPO. 10 (50%) have switched to an altenative anti-IL5 agent - 10 switched to benralizumab, 1 initially on benralizumab to reslizumab. 9/10 had achieved partial response prior to switch (reduction in steroids / relapse rate), 1/10 had no response.. During the duration of the study, 3 patients had a break of therapy, but all resumed anti-IL5 treatment with good response. Hence, all 20 remain on anti-IL5 beyond 24M. After 36M, one patient required cyclophosphamide along with anti-IL5 therapy for myocarditis. A further patient had Rituximab for EGPA/ Rheumatoid arthritis overlap between anti-IL5 agents.

Conclusions

In this study, there was a 50% reduction in steroid dosage by 12 months and steroid requirements continue to decrease to 36M. By 24 months 2 are steroid free and a further 10 on weaning dose ≤ 5mg. Furthermore, the number on adjuvant conventional immunosuppression reduced over the 24M (n=4 at 24M). This study demonstrates that anti-IL5 therapy serves as a favorable model for steroid and conventional immunosuppressant minimization in EGPA. Clinical benefits of reduction in BVAS, improved pulmonary function tests and reduced serum eosinophilia were recorded. The relapsing nature of EGPA places a dependency of therapy on steroids and this study demonstrated sustained and ongoing improvement annually with continued anti-IL5 therapy. Some participants required a switch in anti-IL5 agent.

Figure 1: Response to anti-IL5 therapy

Response to therapy by 36 months					
M0	**M6**	**M12**	**M18**	**M24**	**M36**
Prednisolone dose Mean ±SD					
18mg ±10.31	12.26mg ±6.8	9.37mg ± 5.3	9.71mg ±8.1	7.7mg ±7.08	5.95mg ±5.21
BVAS	**M0**	**M6**	**M12**	**M18**	**M24**
Median ±IQR	5 [3-7]	1.5 [0-2]	1 [0-2]	0.5 [1.25-0]	0 [0 -1]
Eosinophil count N=15		**M0**	**M12**	**M24**	
Mean ±SD		0.42mg ±0.33	0.04±0.039	0.04±0.034	
Creatinine n=13		**M0**	**M12**	**M24**	
Mean ±SD		67.53±11.01	67.69±11.98	72.23±15.23	
FEV1/%FEV1 N=15		**M0**	**M12**		
Mean ±SD		2.11±0.66/68.38±22.72	2.39±0.62/82.61±21.79		
FVC /%FVC N=15		**M0**	**M12**		
Mean ±SD		3.42±0.87/94.27±18.57	3.67±0.93/105.60±20.47		

Adjuvant Conventional Immunosuppression (ACIS)						
Time point.	M0	M6	M12	M18.	M24	M30	M36
Participants.	20	20	20	20	20	20	20
No. on ACIS.	10	9	8	7	4	5	4
No. that stopped ACIS	6						
No. that started ACIS.	4 (3 subsequently stopped)						

Table: Response to therapy. Using anti-IL5 therapy supports favorable outcomes including steroid minimization, reduction in adjuvant immunosuppression and reduction in eosinophil count are recorded.

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Poster number: 382

Submission number: 377

Membranoproliferative Glomerulonephritis with the crescent formation in a patient with Polycythaemia Vera: A case study and literature review.

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Dr Anandkumar Pari

Biography
Dr Anandkumar Pari received his undergraduate graduation (M.B.B.S) from D. R. Ambedkar Medical College, Rajiv Gandhi University of Health Sciences, Bangalore, India and received M.R.C.P(U.K) from Royal College of Physicians, London. He has 13 years of clinical experience. Currently he is working as Non-Trainee Registrar in Renal Medicine at Birmingham Heartlands Hospital.

Abstract

Introduction:

Polycythaemia Vera (PRV) is a chronic myeloid neoplasm associated with an increased risk of thrombosis, hypertension, cerebral infarction and disease progression to either myelofibrosis and/or acute leukaemia. It usually involves bone marrow, liver, and spleen. The glomerular disease has rarely been reported in PRV. Here in, we describe the case of an Afro-Caribbean gentleman with JAK2 mutation PRV who presented with nephritic syndrome and was found to have membranoproliferative glomerulonephritis (MPGN) with crescent formation on Kidney histopathology. He was successfully treated with induction and maintenance immunosuppression. We discuss his case and a few previously published reports for greater awareness regarding disease presentation and management.

Case presentation:

A 54-year-old Afro-Caribbean gentleman had a past medical history that was significant for Polycythaemia Vera(JAK 2 exon 12 mutation 69% VAF with secondary myelofibrosis), hypothyroidism, and hypertension. Medications included Aspirin, levothyroxine, and amlodipine. He was under regular haematology follow-up and received pegylated interferon and venesection (as required), until recently when he was diagnosed with polycythaemia induced myelofibrosis and these interventions were suspended in November 2022.

He was referred to Renal service in January 20232 with recurrent haematuria for one month. He was hypertensive and had significant peripheral oedema. urinalysis revealed 2+ protein, 2+ blood. A renal immunology screen returned normal results. A kidney biopsy composed of 14 glomeruli showed enlarged glomeruli with mesangial cell proliferation, diffuse mesangial and sub-endothelial electron-dense deposits for IgA and C3, podocyte foot process effacement and crescent formation in 2/14 glomeruli. These features were consistent with an MPGN lesion.
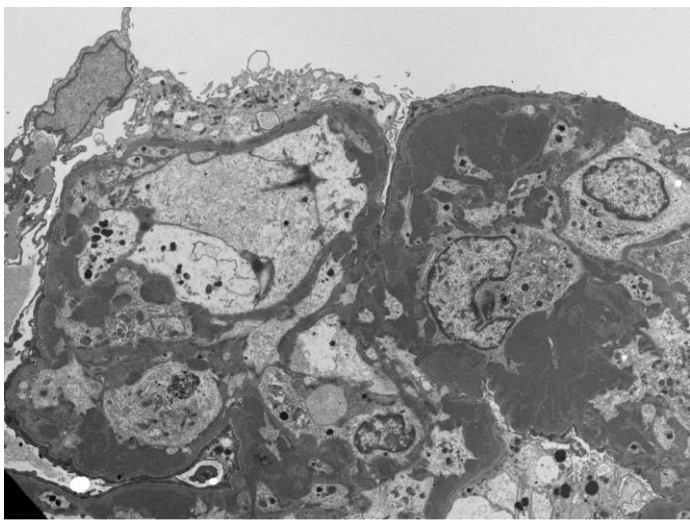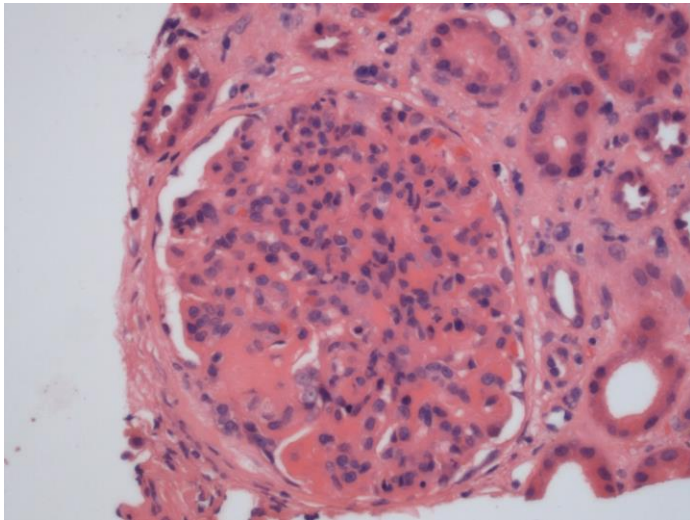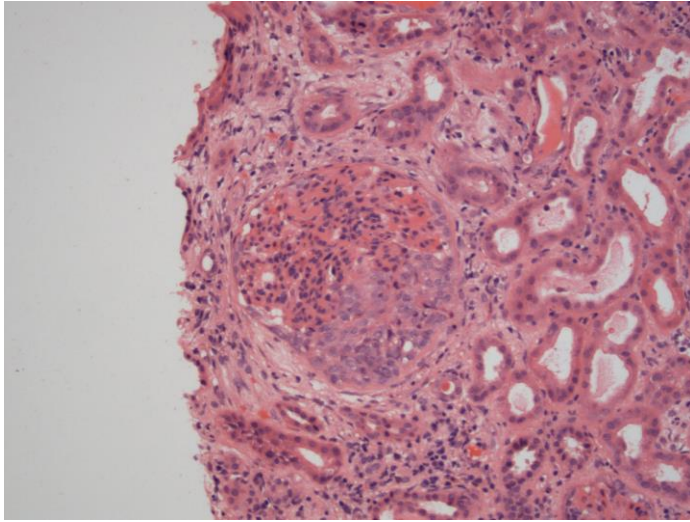
He was successfully treated with pulsed intravenous corticosteroids, a tapering oral regimen for four months, and six cycles of cyclophosphamide followed by long-term azathioprine treatment. His response has been excellent with normalization of renal function, significant reduction in proteinuria, and improvement in blood pressure and edema.

	Jan/23	Feb/23	May/23	Oct/23	Dec/23
Urea	17	17.3	9.9	8.5	8.2
Creatinine	244	152	112	103	90
eGFR	25	45	65	72	84
Urine ACR	190.1	187.9	44.5	53.1	61.8
S. Albumin	19	30	37	40	43
Hb	66	96	137	134	134
WBC	3.86	7.92	4.5	11.05	7.99
Platelets	223	362	170	211	231

Discussions:

Glomerular disease has been rarely reported in patients with PRV. Our literature search revealed 3 cases with a comparable presentation (tabulated). Most of the patients, inclusive of our case, presented with severe renal impairment, heavy proteinuria or nephrotic syndrome, and hypertension. Renal Biopsy revealed characteristic MPGN features in all cases except one, which revealed features consistent with pauci immune GN (though vasculitis work-up was negative). Two cases, including ours, responded well to immunosuppressive treatment with improved renal function and proteinuria. Interestingly, one case responded solely to anti-platelet and anti-coagulant treatment along with hydroxyurea, suggesting activated platelets, enhanced coagulation state, and endothelial damage may contribute to glomerulopathy associated with polycythaemia vera in some cases[5]. Our patient had a small number of crescents in the renal biopsy specimen with a majority of viable glomeruli, hence the excellent recovery. Previous cases with extensive glomerular crescents with the need for renal replacement therapy have shown a poor renal and patient prognosis[2]. In summary, PRV can result in glomerular disease- early diagnosis and treatment have a favourable impact on long-term prognosis.

Author, year	Age	Gender	PV duration	PV treatment	Renal functions	Histopathology LM; IF; EM	Clinical presentation	Treatment	outcome
Kanauchi (11), 1994	55	M	3 years	Ranimustine, Busulphan, Cyclophosphamide	BUN- 290, Creat- 309, urine protein 14.3g/day, ANA elevated	MPGN, CGN; IgA; NR	RPGN- HSP while on ranimustine ANA positive ANCA- not done	Pulse steroid, Cyclophosphamide, HD	Recovered, create- 195
Dwivedi (5), 2022	50	F	Diagnosed at the time of presentation	Not applicable	BUN-34, Creat- 2.4mg/dl, urine protein 8.4gm/day	Cresentic glomerulonephritis, IF- No deposits	RPGN pauci- immune Crescentic Glomerulonephritis	Pulse steroid, cyclophosphamide, Hydroxyurea, Venesection, ITU- Ventilation, CRRT	On day 7, developed haemoptysis, Death
Nishi Y (8), 2010	72	F	13 years	Hydroxyurea and venesection	BUN-12, Creat- 0.49 mg/dl, albumin – 2.9g/dl, urine protein- 6.14 g/ day	MPGN type 1	Nephrotic syndrome picture MPGN	Anti-platelet, Warfarin, ARB, Calcium channel blockers, Thiazide diuretics, Hydroxyurea	Improved clinically. Urine protein 3g/day, s. albumin->3.0 g/dl
This case	53	M	8 years	Pegylated Interferon 45mcg weekly- stopped 1 month before the symptoms, venesection.	Urea- 17, creat- 244, UACR- 190.1	Crescentic Glomerulonephritis, MPGN; IF- IgA, C3,	RPGN Immune-complex mediated Crescentic Glomerulonephritis	Pulse steroid, cyclophosphamide, long-term Azathioprine.	On partial remission urea- 8.2, create- 90, GFR- 84

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Poster number: 383

Submission number: 378

Use of Belimumab in Patients with Lupus Nephritis Refractory To Standard Treatment

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Dr Luxme Nadarajah

Biography
Renal registrar training at Barts Health. Have an interest in peritoneal dialysis and lupus nephritis. Completed PhD in the effect of uraemic toxins on the endothelium.

Abstract

Introduction The risk of progression to end stage kidney disease (ESKD) following identification of Lupus nephritis (LN) is 10-30 %, this risk has remained unchanged for decades. The landmark BLISS-LN trial led to belimumab being the first FDA approved drug for patients with active LN. We present our case series of LN patients treated with belimumab after previous treatment resistance with cyclophosphamide and / or rituximab.

Methods All patients who had biopsy proven LN with class III or above and received belimumab were prospectively recorded. Case notes were reviewed and outcomes at 1 year were analysed. Key outcome measures that were studied at 1 year were eGFR, urine protein creatinine ratio (uPCR), and SLEDAI-2K score.

Results 11 patients with biopsy proven LN were treated with belimumab. 10 /11 (90%) patients were female, 8 /11 (72%) were of black ethnicity, median age at diagnosis and duration of disease was 22 years and 72 months respectively. 10/11 (90%) patients received cyclophosphamide and 8/11 (72%) had rituximab prior to belimumab treatment. All patients had treatment with MMF, steroids and hydroxychloroquine. At initiation of therapy median eGFR was 52mL/min, uPCR 1.64 g/mmol, SLEDAI-2K score was 16. One patient had commenced haemodialysis at the time of treatment. At 1 year 7/10 (70 %) patients did not see a fall in eGFR of greater than 20%, 5/10 (50%) had a uPCR < 1g/mmol, 1 person commenced dialysis and 1 person died. Markers of disease activity improved with a median SLEDAI-2K score of 8. The one patient on haemodialysis was able to successfully receive a kidney transplant.

Discussion The data presented here shows successful real world experience of belimumab in patients who showed features of relapse in disease activity having previously had cyclophosphamide or rituximab. The cohort was predominately black with lower median eGFR and longer duration of disease. Despite this, good 1 year outcomes of renal markers were seen and with an improvement in overall disease activity. Belimumab therapy represents real promise in decreasing progression to ESKD in LN.

Poster number: 384

Submission number: 207

Diagnosis of membranous nephropathy in the PLA2R antibody era - Single Centre experience in a tertiary renal unit.

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Dr Mariyam Adam

Biography
ST5 Renal Registrar

Abstract

Introduction

Our understanding of membranous nephropathy (MN) especially primary membranous nephropathy has advanced in the last two decades with the discovery of phospholipase A2 Receptor antibodies and availability of commercial essays for testing. KDIGO 2021 GN guidelines reflected this by suggesting that we should avoid biopsy in patients who have positive serum PLA2R auto antibodies (sPLA2R) with preserved renal function (eGFR >60)[1].

We audited our patients who underwent biopsy to diagnose membranous nephropathy to assess local practice.

Methods

Patient with a histological diagnosis of membranous nephropathy were identified using local histopathology database from January 2020 to June 2023. Patient information was collected using an MS Excel spreadsheet.

Results

52 patients had a biopsy diagnosis of membranous nephropathy. 12 patients were excluded among which, 8 had lupus nephritis, 1 transplant biopsy, 2 with concurrent FSGS and 1 deemed to have TMA on review. A further 9 patients had second biopsies for recurrence of membranous nephropathy. Remaining 31 patients were included in the following data analysis.

Median age of presentation was 65 years and 51% of patients had an eGFR >60 at presentation. sPLA2R testing was available in 97% of these patients. The average waiting time for sPLA2R testing result was 32 days. 29% of patients had sPLA2R results available prior to biopsy but ranged from few days to weeks.

17 patients (55%) had a positive sPLA2R test and all of them were diagnosed with primary MN after being screened for secondary causes.

Of the 12 patients who tested negative for sPLA2R, 4 patients had secondary MN .

Patients were screened for malignancy regardless of sPLA2R positivity. CT thorax, abdomen and pelvis was the most common investigation (25) followed by endoscopy (12) and >50% patients who underwent each of these investigations were sPLA2R positive.

Discussion

From our data we postulate that 3 patients did not need a biopsy as they had normal kidney function and were at low risk of progression and 6 patients in which biopsy could have been avoided as per KDIGO guidelines.

We show that although positivity of serum PLA2R is highly specific (99%) for primary MN[2], we continue to routinely biopsy patients presenting with nephrotic syndrome either before or after PLA2R results are available. This could relate to lack of availability of inhouse testing for PLA2R in most centres including our tertiary centre, which means there is no timely results available for decision making in many patients.

Some guidance has already been stipulated in factoring in to account the sPLA2R assays available across the UK[3]. We hope by introduction of in house sPLA2R testing in our hospital would help clinicians to decide in partnership with patients the merits of a kidney biopsy.

We also continue to routinely do extensive investigations to rule out malignancy in patients with sPLA2R positive MN and this needs further research and clear guidance on the risks and benefits of this heavy investigative burden.

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Poster number: 385

Abstract number: 414

A UK parallel cohort study on renal ANCA associated vasculitis outcomes for avacopan exposed and matched unexposed cohorts

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Lucy Francis

Biography
Lucy studied Medicine at Kings College, London and holds a BSc in Management from Imperial College, London. She is an East of England trainee and an ST7 nephrology registrar at Addenbrookes, Cambridge. With Addenbrooke's charitable trust funding, she is working as a clinical research fellow, with a specific interest in vasculitis and lupus.

Abstract

Introduction:

Avacopan was approved in the UK for severe ANCA associated vasculitis (AAV) in December 2022. The ADVOCATE trial found the differential effect of avacopan on kidney function was greatest in patients with the lowest estimated glomerular filtration rate (eGFR), at highest risk of progression to end stage kidney disease (ESKD). Patients with an eGFR <15 ml/min/1.73 m^2, pulmonary haemorrhage requiring invasive ventilation, under 12 months prognosis, use of plasma exchange and dual therapy with cyclophosphamide (CYC) and rituximab (RTX) were excluded from ADVOCATE; all common scenarios in real life practice. We aim to provide further information on these subgroups and evaluate 6 month renal outcome data in the UK.

Methods:

Parallel cohort study on renal AAV outcomes for avacopan exposed and matched unexposed cohorts, with severe, active GPA or MPA. 120 patients on avacopan from 7 UK centres have been recruited to date. Controls matched by renal function and age will be presented. Comparisons of ESKD, delta eGFR, eGFR recovery, reduction in proteinuria/haematuria, remission, relapse and mortality will be presented, with subgroup analyses for eGFR<15ml/min/1.73 m^2. Steroid exposure will be presented.

Results:

Baseline characteristics of the avacopan cohort are below.

	Number of patients (120)
Demographics	
Median age (IQR)	65 (53-76)
Age >75	13
Female	55 (46%)
Male	65 (54%)
ANCA serotype	
PR3	46 (38%)
MPO	74 (62%)
New presentation	90 (75%)
Relapse	30 (25%)
Pulmonary haemorrhage	21 (18%)
Median eGFR	22ml/min/1.73 m^2 (IQR 10-36)
Berden class if biopsy undertaken (75/120)	
Focal	26 (35%)
Mixed	27 (36%)
Crescentic	15 (20%)
Sclerotic	6 (8%)
Inadequate sample	1 (1%)
Indication	
Steroid sparing	39 (33%)
Refractory disease	1 (1%)
Severe nephritis	19 (16%)
Steroid sparing & refractory disease	1 (1%)
Steroid sparing & severe nephritis	56 (47%)
Refractory disease & severe nephritis	4 (3%)

Table 1. Baseline characteristics

Most received oral prednisolone at avacopan initiation (89%, n= 107) and 54% received intravenous methylprednisolone (n= 65). The majority received RTX alone (44%, n = 53) or RTX and CYC combination

therapy (43%, n=52). Fewer received CYC alone (9%, n=11) and 3% were initiated on alternative immunosuppression (n=4). 26% (n=31) underwent plasma exchange and 13% required haemodialysis (n=16). 3% of patients have died.

Excluding dialysis dependent patients at presentation, median eGFR was 22ml/min/1.73 m^2 (IQR 10-36). eGFR at the time of avacopan initiation was 21ml/min/1.73 m^2 (IQR 11-34).

Discussion:

Avacopan is commonly being used to treat nephritis in patients with a low eGFR, including haemodialysis dependent and elderly patients. Avacopan is frequently used with RTX and CYC combination therapy. 6 month outcome data will provide new data on important patient subgroups excluded from the ADVOCATE trial.

Poster number: 386

Submission number: 620

Mercury-Induced Secondary Membranous Nephropathy with NELL-1 Positivity in an Adolescent Female

Dr Ramseena Ibrahim

Aster MIMS, Calicut

Dr Ramseena Ibrahim

Biography

Dr. Ramseena Ibrahim is a dedicated consultant physician with experience in internal medicine, patient care, diagnosis, and medication management. She completed her MBBS from Kannur Medical College and recently earned her MRCP from the Royal College of Physicians, UK after Internal Medicine Training at Aster Wayanad affiliated with JRCPTB. Her expertise spans inpatient care, patient safety, interdisciplinary coordination, and a special interest in nephrology. Dr. Ibrahim has published research papers and presented at conferences. She is an ACLS and BLS certified trainer. With strong organizational abilities to handle multiple responsibilities, she is passionate about medical education and mentoring students, particularly in MRCP preparation utilizing the NHS ePortfolio system. Her goal is to contribute as an IMT faculty member, guiding the next generation of physicians.

Abstract

Introduction:

This late-breaking abstract presents a rare case of secondary membranous nephropathy (MN) induced by mercury exposure from a skin-whitening cream in an adolescent female. The recent identification of this novel exposure mechanism justifies its timely report.

Methods:

An 18-year-old girl presented with nephrotic syndrome. Initial investigations showed nephrotic-range proteinuria, hypoalbuminemia, and hypercholesterolemia. She was treated with corticosteroids for suspected minimal change disease. However, a kidney biopsy was performed due to lack of response, which revealed MN with IgG and C3 deposits. Immunofluorescence studies showed NELL-1 positivity.

Results:

Detailed history revealed the patient had been using a skin-whitening cream containing high mercury levels (3120 ppm). Steroids were stopped, and she was started on an angiotensin receptor blocker

(ARB). After discontinuing the cream, her proteinuria resolved and serum albumin normalized over 3 months.

Discussion:

This case highlights an unusual and underrecognized cause of secondary MN in the adolescent population - environmental mercury exposure. Mercury can trigger autoantibodies against antigens like NELL-1 in the glomerular basement membrane, leading to MN. Early identification of the offending agent and prompt removal along with ARB treatment facilitated disease remission. This rare case underscores the importance of considering toxin exposure in atypical MN presentations and performing detailed evaluations.

In conclusion, the findings from this case highlight the importance of considering environmental toxin exposure in the differential diagnosis of atypical presentations of membranous nephropathy. Early identification and prompt intervention can lead to successful disease remission. Sharing this knowledge through presentation at UKKW 2024 can contribute to improved clinical practice and patient care.

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An atypical case of PLA2R antibody-positive Membranous with Full-House Nephropathy

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Dr Maria Angela Gauci

Biography

Dr Gauci graduated in Medicine and Surgery with the University of Malta in 2015. Upon completion of training in 2024, she will embark on a consultancy post at the Bradford Teaching Hospital Foundation Trust. She takes interest in local and national guideline development, and is particularly passionate about glomerular disease and transplantation.

Abstract

Introduction

Full-house immunonfluoresence (IF) staining in a renal biopsy is commonly encountered in lupus nephritis, while its co-existence with other types of glomerular disease in the absence of systemic lupus erythematosus (SLE) manifestations is rare. We describe the case of a 52-year-old gentleman with anti-phospholipase A2 receptor antibody (PLA2R Ab)-positive primary membranous nephropathy (PMN) and seronegative non-lupus full-house nephropathy (FHN) who responded well to the RITUXILUP protocol.

Methods

Written consent was obtained from the patient in question. The renal biopsy was examined through light microscopy (LM), electron microscopy (EM) and appropriate IF tests were performed.

Case Report

Mr WV presented with nephrotic syndrome in June 2016 (urine PCR 760 mg/mmol, albumin 25.6 g/L). PLA2R antibody was positive (titre of 1:80) while the rest of the immune screen was negative. Renal biopsy revealed subepithelial deposits with spikes on EM while IF was unremarkable. A diagnosis of PMN was made and treatment with ACE inhibition and Calcineurin inhibition was initiated. He spent a few years on tacrolimus (aiming a trough level between 3-8 ng/ml) with good initial effect, though his renal function slowly declined, proteinuria increased (uPCR 270 mg/mmol) while PLA2R Ab remained high.

This led to withdrawal of tacrolimus and administration of rituximab and dapagliflozin in 2022. Initially, PLA2R titre declined but this was followed by relapsed nephrotic syndrome in June 2023 (uPCR 360 mg/mmol, albumin 29 g/L).

A repeat kidney biopsy showed diffuse segmental spikes with very focal mesangial hypercellularity and mild IFTA on LM. PLA2R Ab staining was positive in the subepithelial space. EM showed old intramembranous, new subepithelial, subendothelial and mesangial deposits, no tubuloreticular inclusions, and extensive foot process effacement. IF revealed granular mesangial and capillary wall deposition of IgG, IgA, IgM, C3 and weak C1q. ANA remained persistently negative with normal complement levels, thus a diagnosis of PMN with 'non-lupus' FHN with was made.

Given these findings and his previous response to rituximab, he was treated using the steroid-sparing RITUXILUP protocol (1). Two doses of 1g of rituximab were administered 2 weeks apart and mycophenolate mofetil was started at 500mg BD and uptitrated to 1g BD. Three months later, there was significant clinical improvement (uPCR 250 mg/mmol, serum albumin 40 g/L, PLA2R Ab undetectable, SeCr dropped from 170 µmol/L to 125 µmol/L).

Discussion

A few reports suggest that FHN may be the first presentation of SLE without serological manifestations, though seroconversion only occurs in a minority. The prevalence of non-lupus FHN is reported to be around 20% in the literature, and the commonest diagnoses associated with it include MN (25.9%), IgAN (22.2%) and MPGN (14.8%) (2).

Non-lupus FHN, lupus nephritis and primary membranous may all share similar pathophysiological processes, involving the activation of diverse B-cell lineages resulting in IgG production, immune complex formation and complement pathway dysregulation.

The use of several immunosuppressive regimes with varied clinical response have been documented in the literature, but the optimal therapeutic approach remains to be ascertained. Corticosteroids have been commonly used in FHN (2, 3), but the authors opted for a steroid-free regime to reduce adverse events. The patient's response to the RITUXILUP regimen suggests a novel therapeutic approach to target PMN with lupus-like features on renal biopsy.

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Poster number: 388

Submission number: 497

Clinical experience with avacopan for ANCA-associated vasculitis

Dr Dominic Ridgewell, Dr Lucy Smyth, Prof Coralie Bingham

Royal Devon University Healthcare NHS Foundation Trust, Exeter

Dr Dominic Ridgewell

Biography
Dominic is an Internal Medicine Training stage 1 doctor with an interest in vasculitis

Abstract

Introduction

Avacopan is an orally administered small-molecule C5a receptor antagonist that is recommended by National Institute for Health and Care Excellence (NICE) for use in patients with Antineutrophil cytoplasmic antibody (ANCA) associated vasculitis alongside a cyclophosphamide or rituximab regimen. The ADVOCATE phase III clinical trial compared avacopan 30 mg twice daily to a tapering course of prednisolone in these patients and found non-inferiority in remission at 26 weeks and superiority in sustained remission at 52 weeks, with lower rates of serious adverse events and glucocorticoid toxicity (Jayne et al., 2021). However, there is little published data outside of clinical trials.

We aimed to review our experience of using avacopan.

Methods

Data was gathered from the electronic patient records of 5 patients who were prescribed avacopan with first presentation, chronic or relapsed ANCA-associated vasculitis.

Results

Patient	Age	Sex	ANCA status	Vasculitis presentation	Organ involvement	Induction treatment	Weeks on avacopan	Reason to stop avacopan	Avacopan side effects
1	68	Male	PR3	New	Renal Skin Neurological	Methylprednisolone & iv cyclophosphamide	11		
2	20	Male	PR3	New	Chest Renal	PLEX, iv cyclophosphamide, rituximab	4	Failed response	
3	39	Male	PR3	New	Renal Joints Eyes	PLEX, iv cyclophosphamide, rituximab	36		Leucopenia
4	76	Male	MPO	Relapse	Renal Chest	PLEX, iv cyclophosphamide, rituximab	38		Diarrhoea
5	56	Male	PR3	Chronic	Renal Chest	Prednisolone and azathioprine	12	Flare of vasculitis +/- infection	

Table 1: Patient responses to avacopan
Legend; ANCA: Antineutrophil cytoplasmic antibody, PR3:Proteinase 3, MPO: Myeloperoxidase, IV: Intravenous

Discussion

The response to avacopan was mixed, two patients had to stop treatment. Patient 2 was younger than the ADVOCATE cohort, he did not achieve remission with avacopan and required conversion to steroids. Patient 5 received avacopan as an adjunct to assist with steroid wean on the background of chronic treatment resistant disease but this was unsuccessful. He had a complex admission with respiratory disease thought primarily a flare of his vasculitis whilst on avacopan and reduced steroid. He responded to further high dose steroid and rituximab. Three patients are currently in remission on avacopan, patient 4 presented with a relapse whilst on prednisolone and mycophenolate but responded to re-induction and conversion of steroids to avacopan. They had some diarrhoea whilst on treatment One patient has had persistent leucopenia despite a pause in cyclophosphamide and a switch to rituximab, further requiring a pause in avacopan for 4 weeks and enhanced monitoring. Another patient experienced diarrhoea. Oral C5a receptor antagonists are a new therapy in the management of ANCA-associated vasculitis, further observational data in real-world cohorts will help stratify patients who are best suited to this approach.

References

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Changes in Body Mass Index Following a Diagnosis of Antineutrophil Cytoplasmic Antibody Associated Vasculitis

Dr Tania Salehi[1,2], Dr Thomas French[3], Professor Neeraj Dhaun[3,4], Dr Robert W Hunter[3,5]

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Dr Tania Salehi

Biography
Australian nephrology and immunology trainee, working as a clinical fellow in renal medicine at the Royal Infirmary of Edinburgh

Abstract

Introduction

Contemporary treatments for Antineutrophil Cytoplasmic Antibody (ANCA)-associated vasculitis (AAV) have turned what was once a fatal condition into a chronic disease. The major challenge facing doctors and patients dealing with AAV is now managing long-term morbidity and cardiovascular risk. Obesity is prevalent and has a detrimental effect on quality of life. This has not been extensively studied. We aimed to characterise changes in body weight following a diagnosis of AAV and identify risk factors for becoming overweight.

Methods

We analysed data from a single-centre registry of patients with AAV (436 patients diagnosed in 2003–2023). We also included patients with ANCA-negative, anti-GBM-negative pauci-immune vasculitis. We assessed the trajectory of body weight and body mass index (BMI) after diagnosis of AAV. We conducted a multivariable logistic regression analysis to identify baseline factors associated with being overweight (BMI >25kg/m^2) or obese (BMI >30kg/m^2) at 6 months post-diagnosis.

Results

207 individuals had available baseline BMI data and were included in the analysis. Baseline characteristics were similar between PR3 and MPO-positive groups, the exception being that PR3-positive patients were more likely to have been treated with cyclophosphamide. On average, patients

tended to gain ~5% of body weight in the first six months after diagnosis and to sustain this weight gain for at least two years (Figure). At six months, mean(±SD) BMI was 29.1±14.8 kg/m^2, 67% of patients had a BMI >25kg/m^2 and 36% had a BMI of >30kg/m^2. Baseline characteristics that predicted being overweight at six months were a higher BMI [adjusted odds ratio (aOR) 1.83, 95% confidence interval (CI) 1.50–2.24] and lower serum Cr (aOR 0.18, 95% CI 0.04–0.85 if Cr>235mcM). The risk factors for being obese at six months were higher baseline BMI (aOR 2.49, 95% CI 1.78–3.48), and having an ANCA-positive serotype (aOR 0.04, 95% CI 0.002–0.82 if ANCA-negative). Steroid dose was not a significant predictor of weight gain, likely reflecting a near uniformly high steroid dose in this era. Similarly age, year of presentation and induction immunosuppression modality were not significantly associated with the risk of becoming overweight or obese.

Discussion

We have shown that weight gain is common following a diagnosis of AAV and that two-thirds of patients are overweight 6 months after a diagnosis. This weight gain is often sustained for years and is likely to have a significant detrimental effect on quality of life and the risk of cardiovascular disease and T2DM. The likely predominant cause for this is exposure to corticosteroids. The apparent protective effect of being ANCA-negative is probably explained by this being a proxy for less steroid exposure. The single biggest risk factor is having a higher BMI at baseline; our analysis suggests that other putative risk factors are far less important. Having a very high serum Cr is protective, presumably due to the adverse effects of uraemia on appetite. We plan to use these results to identify those individuals at risk of becoming overweight, so that we can prioritise pro-active lifestyle intervention and steroid-sparing therapies such as Avacopan.

Body weight for individuals plotted relative to body weight at time of presentation with vasculitis. The heavy line is the population average (smoothed conditional mean computed using a generalised additive model).
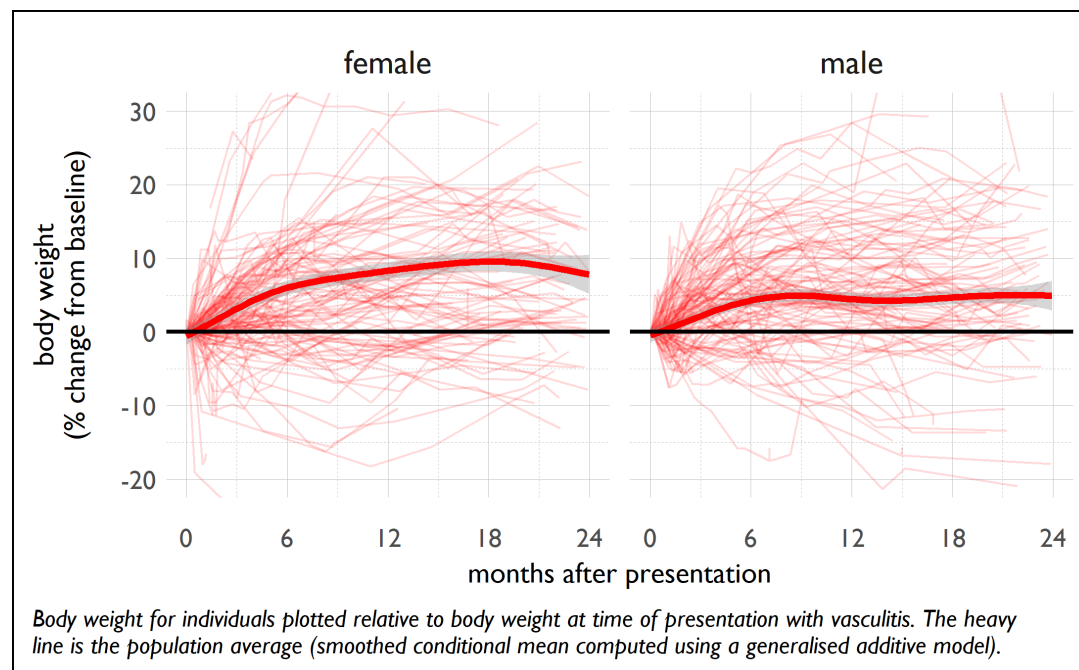
Poster number: 390

Submission number: 537

Increasing demand for immunomodulatory drug administration through the renal infusion suite in a tertiary centre: a service evaluation project

Dr Charlotte Talbot[1], Alison Moore[1], Gemma Saeed[1], Dr Jennifer Pinney[1], Professor Lorraine Harper[1,2], Dr Dimitrios Chanouzas[1,3]

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Dr Charlotte Talbot

Biography
Dr Talbot is currently an academic foundation trainee at University Hospital Birmingham (FY2) in the West Midlands Deanery, this work was created as part of the academic rotation in renal medicine.

Abstract

Introduction:

Treatment with intravenous infusions of immunomodulatory drugs like rituximab (RTX) and cyclophosphamide represents the cornerstone of management for many immune mediated renal diseases. The ability to deliver these therapies on an urgent basis for induction of remission in severe disease is recognised as an important quality care indicator. Administration of rituximab (RTX) at set intervals is becoming the preferred choice for maintenance of remission in ANCA associated vasculitis (AAV), with many patients requiring extended courses of treatment in the context of frequently relapsing disease. More recently, there has been an increase in the use of rituximab for membranous nephropathy (MN), where it is now established as first line treatment in most cases. In addition, RTX is increasingly being used off label in our centre for frequently relapsing minimal change disease (MCD) and focal segmental glomerulosclerosis (FSGS). We carried out this service evaluation project to better understand how the demand for immunomodulatory drug administration through our renal infusion suite has changed over the last 5 years and identify areas that can potentially be further developed to increase capacity within our service.

Methods:

We collected data on the number of infusions delivered through our infusion suite from 2018 to 2023. Data were collected via Informatics and included date of infusion, drug administered and indication. Given that we only had data for the first half of the 2023/2024 financial year, data displayed for the full 2023/2024 financial were extrapolated to predict anticipated demand.

Results:

There were a total of 2983 infusions of immunomodulatory drugs delivered through our infusion suite over the 5-year period studied. The majority of these were for RTX (57%). Demand increased by 27.9% from 2018/2019 to 2022/2023 (from 493 to 631 infusions total for each financial year), with a predicted increase of 53.8% for the full financial year 2023/2024 compared to 2018/2019 [Figure 1].

Figure 1: Number of total infusions per financial year 2018 -2023 with the predicted amount for the year 2023/2024
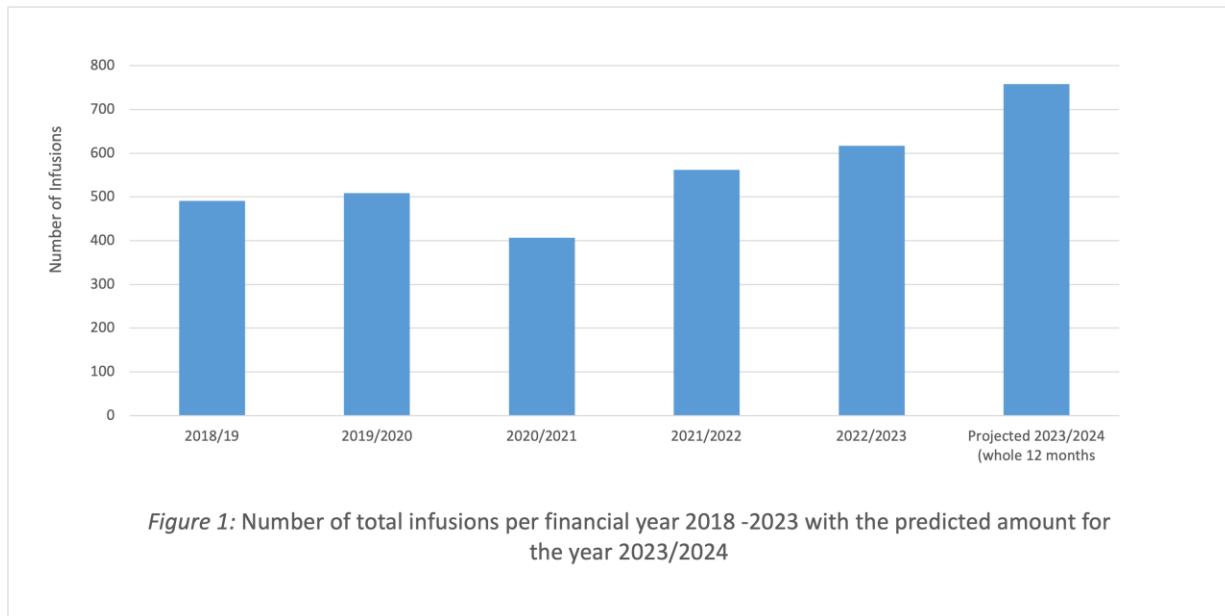
Number of infusions delivered per week fluctuated over the course of the year (minimum of 2 to maximum of 24 per week). The median number of infusions delivered per week increased by 47.3% from 2018/2019 to 2023/2024 (9.5 to 14 per week) [Figure 2].

Figure 2: Graph showing Median and Mean number of infusions per week, with maximum and minimum number of infusions per week from 2018-first 6 months of 2023/2024
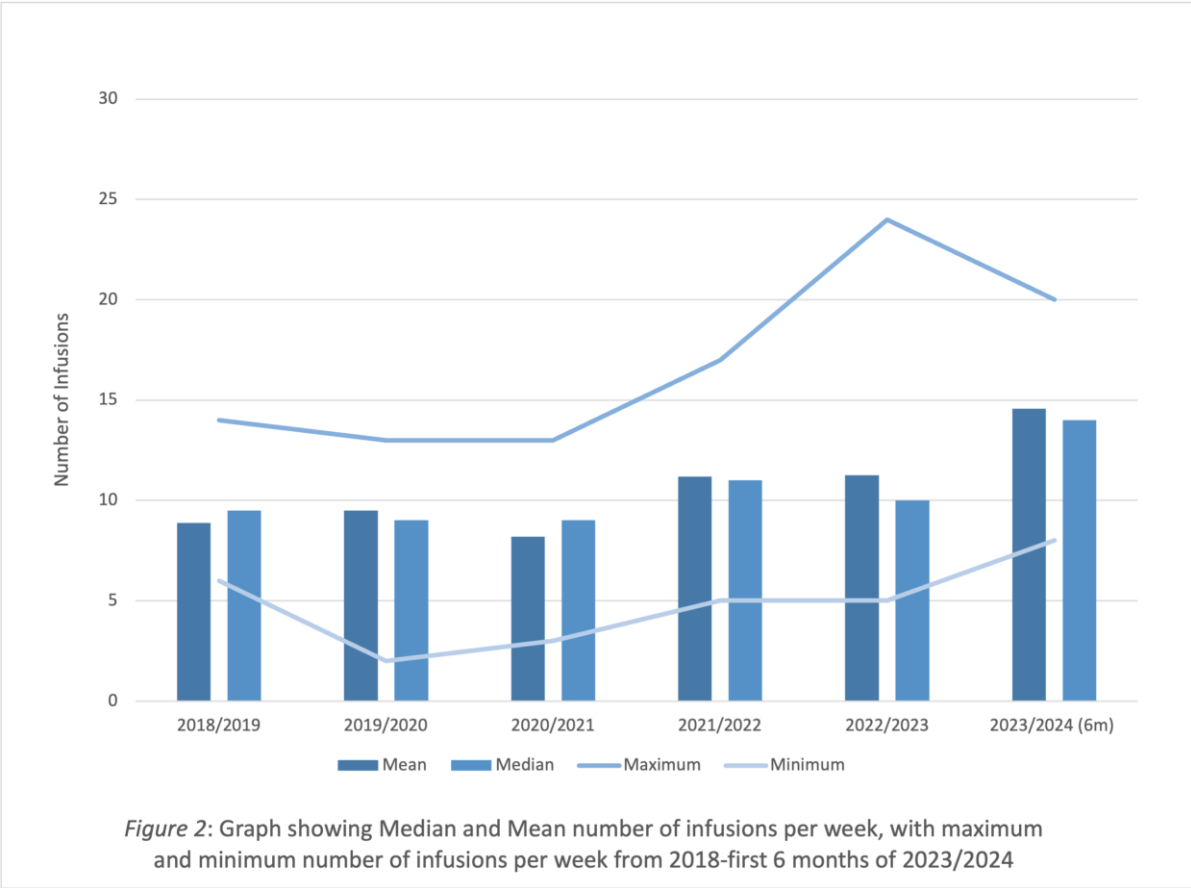
Infusions for AAV increased by 89% from 2018/2019 to 2022/2023, and by 278% for MCD/FSGS for the same period [Figure 3].

Figure 3: Chart showing the most common groups of disorders and the change in demand from 2018- predicted for 2023/2024 full year
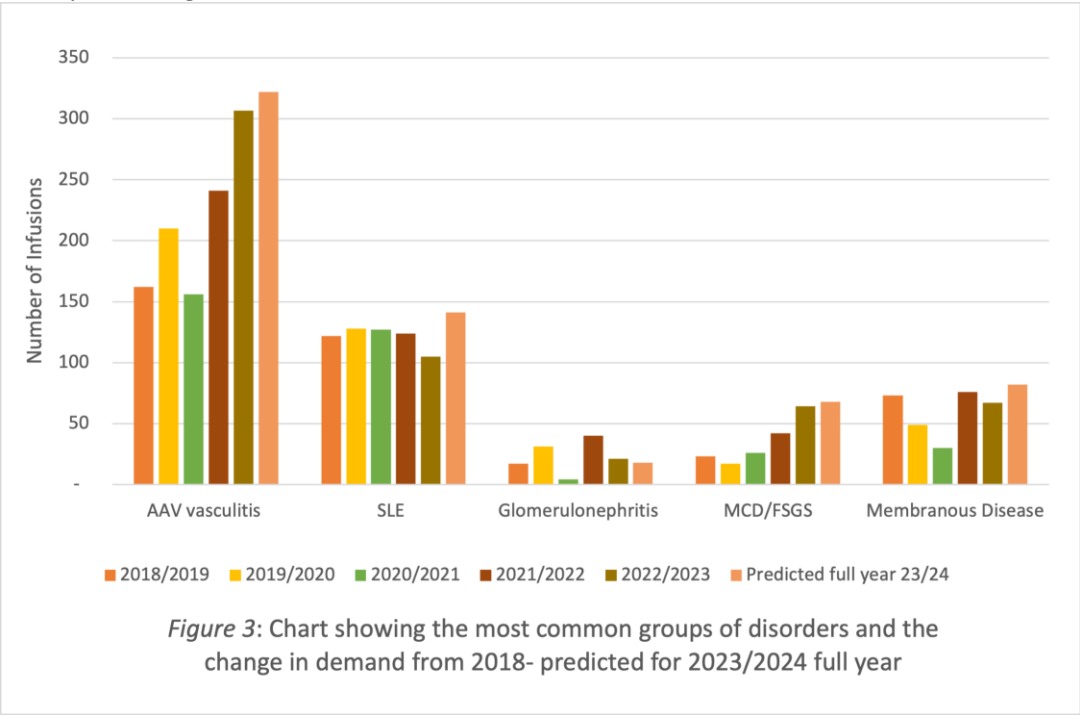
We were able to obtain details on the type of immunomodulatory agent delivered for 595/2983 infusions. Infusions for RTX increased by 213% (46 to 98) from 2018/2019 to 2022/2023. [Figure 4].

Figure 4 Rituximab infusions over the last 5 years (any drug data available for 595 infusions) from 2018- predicted full year 2023/2024
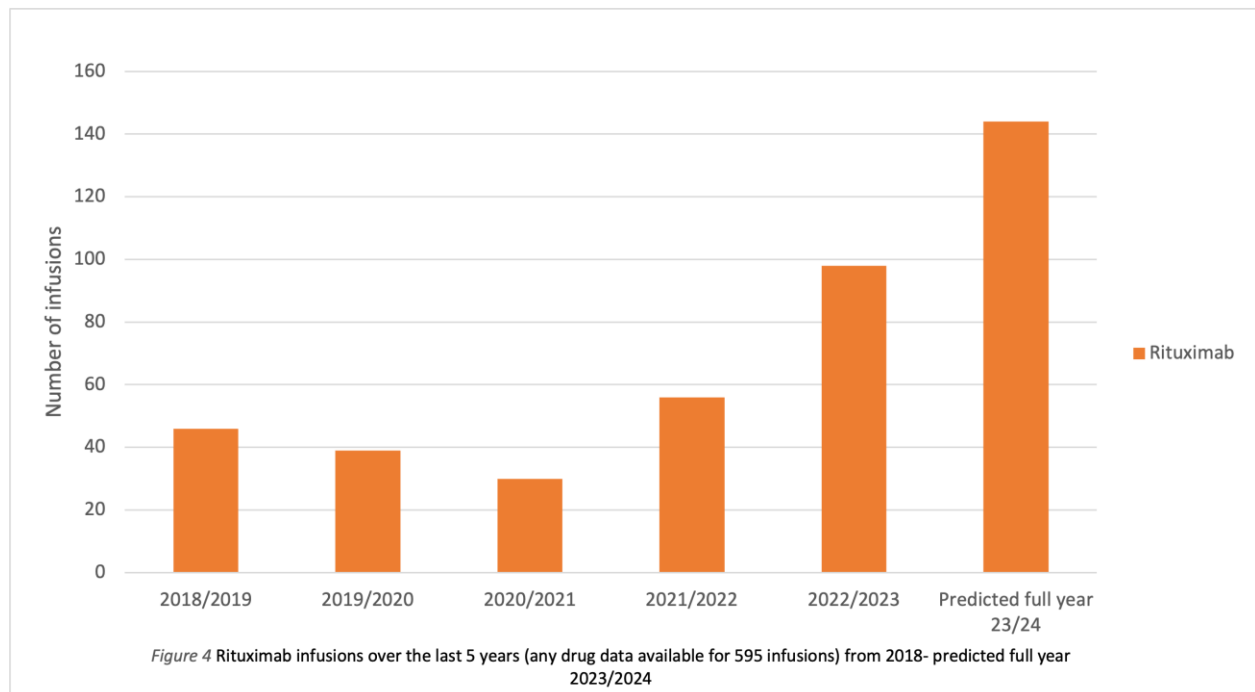
Discussion:

This service evaluation has shown that the demand on our renal infusion suite service has increased greatly over the last five years. This is important when planning capacity to ensure delivery of a service that maintains timely delivery of these agents. In addition to infusions delivered on site, we deliver home RTX in the community for maintenance of remission in AAV for a small number of patients (currently 11 patients). We aim to substantially increase the numbers of patients treated at home which will also help ease demand on the infusion suite.

Poster number: 391

Submission number: 556

Can the Kidney Failure Risk Equation (KFRE) be used in ANCA associated glomerulonephritis?

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Dr Louise Moore

Biography
Dr Louise Moore is a renal registrar at the Royal Preston Hospital. She is currently an ST5 trainee and from August 2024 is taking time out of programme to research frailty and ANCA associated glomerulonephritis.

Abstract

Introduction:

The Kidney Failure Risk Equation (KFRE) provides a 2 and 5 year probability of treated kidney failure for a patient with chronic kidney disease (CKD) stage 3a to 5. KFRE has been validated in over 30 countries, including the United Kingdom (UK) and has become a useful tool to aid clinical decision making (1). However there has been limited validation to determine if KFRE can be used in primary renal pathologies such as ANCA associated glomerulonephritis (AAGN).

We conducted a retrospective cohort study of patients with AAGN at a single centre in Lancashire, UK to determine if KFRE accurately predicts end stage kidney disease (ESKD).

Methods:

Patients diagnosed with AAGN between 2009 and 2018 were screened for inclusion. Exclusion criteria included mortality within 6 months of diagnosis, those that remained dialysis dependent 6 months after diagnosis, transfer out of area, eGFR >60ml/min/1.73m^2 and missing biochemical results required to calculate KFRE. Baseline and clinical characteristics were collected. The UK 4-variable KFRE was calculated at 6 months (+/-3 months) and 18 months (+/- 3 months) after initial diagnosis of AAGN (1). Clinical outcomes including ESKD (dialysis or transplantation) were recorded.

Statistical analysis was performed. The median and interquartile range were used for continuous variables and frequency and percentage for absolute values. The median and interquartile range were calculated for KFRE. The area under the received operator characteristic curve (AUC) was used to calculate discrimination of KFRE.

Results:

Of the 150 patients screened, 78 patients were included in this retrospective analysis. Median age at diagnosis was 67 years (IQR 61-74 years). Forty one (53%) males and 37 (47%) females were included in the study. Forty two (53.8%) patients had positive anti-MPO antibodies, 29 (37.2%) had anti-PR3 antibodies and 7 (9.0%) had seronegative AAGN. 15 of 78 patients required dialysis or transplantation within the study period assessed.

KFRE was calculated at 6 months (+/- 3 months); the median 2 year KFRE score was 2% (IQR 0.3-5%) and median 5 year KFRE score was 7.1% (IQR 1.1-17.6%). KFRE was calculated at 18 months (+/- 3 months); the median 2 year KFRE score was 0.7% (IQR 0.4 – 2.7%) and median 5 year KFRE score was 2.1% (IQR 0.7 – 9.5%).

In terms of discrimination for KFRE calculated 6 months after diagnosis, in the 2 year analysis, the AUC was 0.74 (95% CI 0.55-0.92) and in the 5 year analysis, the AUC was 0.73 (95% CI 0.55-0.90) (Figure 1). When KFRE was calculated 18 months after diagnosis, in the 2 year analysis, the AUC was 0.75 (95% CI 0.30-1) and in the 5 year analysis, the AUC was 0.81 (95% CI 0.50-1).

Figure 1:
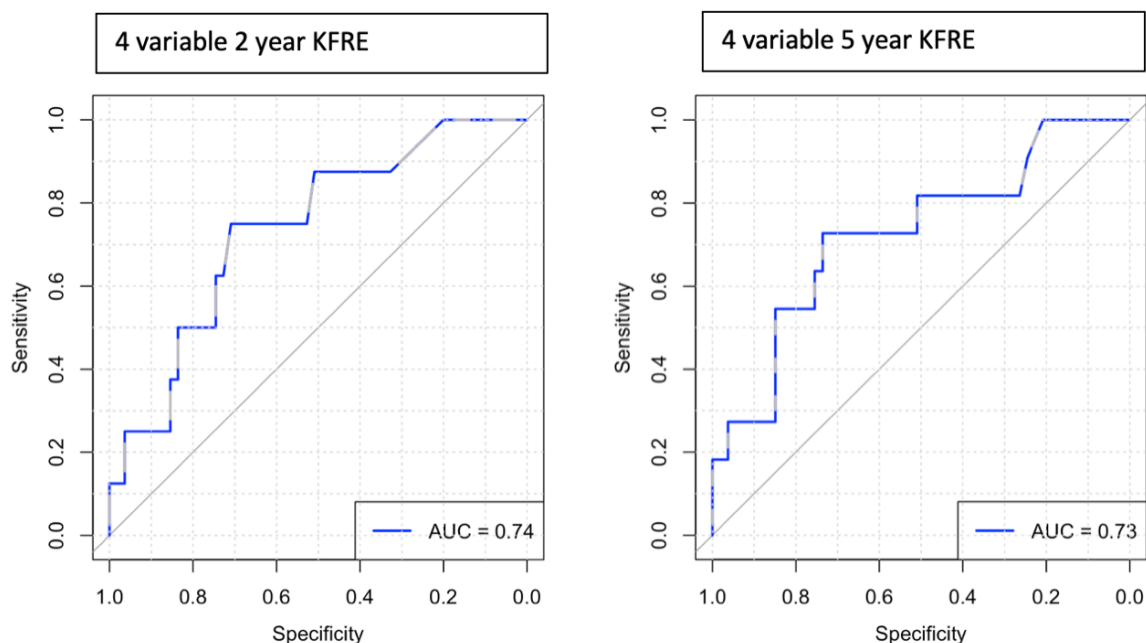
Figure 1: ROC curves for the 4 variable KFRE at 2 and 5 years, 6 months (+/- 3 months) after AAGN diagnosis.

Discussion:

We have shown that KFRE provides fair discrimination, as early as 6 months after initial diagnosis and may provide future clinical utility in AAGN patients that have achieved stable remission. This study was limited by the single centre and small cohort but further analysis and validation on a larger multi-centre cohort is needed before KFRE can be considered for clinical use in AAGN patients.

References

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Poster number: 392

Submission number: 567

Prospective evaluation of usCD163 as a biomarker for active ANCA-associated glomerulonephritis in clinical practice

Dr Amrita Dhutia[1,2], Dr Tom Cairns[1], Dr Maria Prendecki[2], Dr Stephen McAdoo[1,2]

[1]Imperial College Healthcare NHS Trust, London. [2]Imperial College London, London

Dr Amrita Dhutia

Biography

Dr Dhutia is a renal trainee in North West London and Clinical Research Fellow at Imperial College Healthcare NHS Trust. She is in the second year of her postgraduate research degree at Imperial College London and is undertaking research in the field of ANCA-associated glomerulonephritis, supported by an Imperial Health Charity research grant. She has a significant interest in clinical research and has completed the NIHR Associate PI scheme. She is a sub-investigator in several clinical trials recruiting patients with vasculitis at Hammersmith Hospital, London. She is enrolled in the 2023-24 GlomCon Glomerular Disease Fellowship programme, having successfully completed the GlomCon Kidney Pathology Certificate in 2023. She has a special interest in teaching and completed a Postgraduate Certificate in Medical Education (Distinction) at the University of Cambridge in 2019. Dr Dhutia is also a lecturer for the PassPACES course in London.

Abstract

Introduction

There is a need for a reliable non-invasive biomarker of ANCA-associated glomerulonephritis (ANCA-GN) to enable early diagnosis and treatment of active disease and prevent irreversible kidney damage. Several studies have investigated the use of urinary soluble CD163 (usCD163), a specific marker for M2 macrophages, as a potential biomarker of ANCA-GN with a proposed diagnostic threshold of 250 ng/mmol when normalised to urinary creatinine[1]. The aim of this study was to conduct a prospective evaluation of usCD163 as a biomarker of active ANCA-GN in clinical practice in a single-centre in London, UK.

Methods

A prospective observational longitudinal study of patients with ANCA-associated vasculitis (AAV) was conducted, with urine samples collected at time of diagnosis of ANCA-GN, extra-renal flare or from patients in stable remission. Urinary sCD163 levels were measured using a CE certified diagnostic-grade commercial ELISA from Euroimmun and normalised to urinary creatinine. Data are stated in median values ± IQR.

Results

Urine samples were collected from three cohorts from September 2022 to December 2023: 37 patients with ANCA-GN (biopsy-proven in 34 patients), 14 patients with active extra-renal AAV and 10 patients in stable remission.

The median value of usCD163 normalised to urinary creatinine was 252.2 (110.1-840.1) ng/mmol in those with active ANCA-GN, 43.87 (16.79-172.9) ng/mmol in patients with active extra-renal disease and 35.93 ng/mmol in those in stable remission (Figure 1). There was no statistically significant difference when samples were categorised according to the Berden histopathological classification[2], although the median value of usCD163 was highest in those with crescentic disease (870.7 ng/mmol).

The sensitivity of usCD163 in identifying active renal disease in this study of 61 participants with AAV was 51.3% with specificity of 95.9%. The positive predictive value (PPV) was 95.0% and negative predictive value (NPV) was 56.1%.
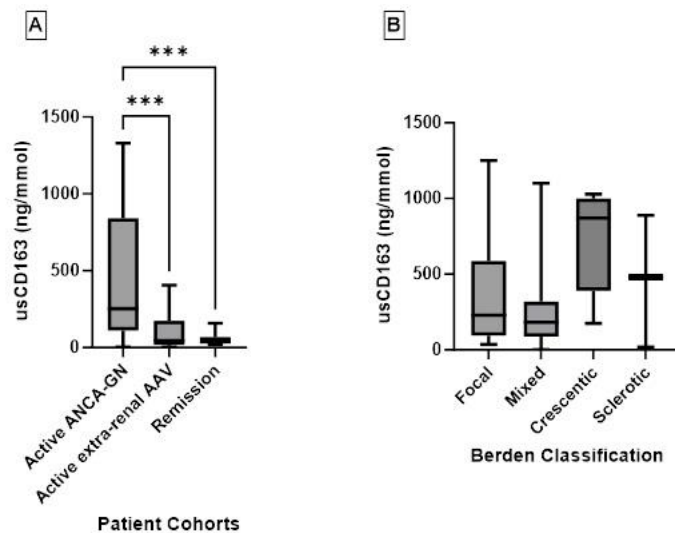
Figure 1. A: Normalised usCD163 in active ANCA-GN, active extra-renal AAV and stable remission, *** = p-value <0.001 (Kruskal-Wallis test); B: Normalised usCD163 levels according to Berden classification.

Conclusions

Urinary sCD163 has a high PPV for renal flare in patients with AAV and therefore has a valuable role as a rapid non-invasive test for early identification of patients who require kidney biopsy and/or treatment. However, a proportion of patients with active ANCA-GN in our cohort did not have normalised usCD163 levels meeting previously defined thresholds for renal flare (>250 ng/mmol)[1], suggesting that this biomarker may not reliably identify patients with mild or focal disease. Kidney biopsy remains an important diagnostic tool when there is a clinical suspicion of active ANCA-GN.

References

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Poster number: 394

Submission number: 589

Avacopan in combination with rituximab and low-dose cyclophosphamide for the treatment of severe ANCA-associated glomerulonephritis

<u>Dr Amrita Dhutia</u>[1,2], Dr Maria Prendecki[2], Dr Fathima Shuaib[1], Dr Marie Condon[1], Prof. Megan Griffith[1,2], Prof. Jeremy Levy[1,2], Dr Nicholas Medjeral-Thomas[1], Dr Lina Nikolopoulou[1], Dr Tom Cairns[1], Dr Stephen McAdoo[1,2]

[1]Imperial College Healthcare NHS Trust, London. [2]Imperial College London, London

Dr Amrita Dhutia

Biography
Dr Dhutia is a renal trainee in North West London and Clinical Research Fellow at Imperial College Healthcare NHS Trust. She is in the second year of her postgraduate research degree at Imperial College London and is undertaking research in the field of ANCA-associated glomerulonephritis, supported by an Imperial Health Charity research grant. She has a significant interest in clinical research and has completed the NIHR Associate PI scheme. She is a sub-investigator in several clinical trials recruiting patients with vasculitis at Hammersmith Hospital, London. She is enrolled in the 2023-24 GlomCon Glomerular Disease Fellowship programme, having successfully completed the GlomCon Kidney Pathology Certificate in 2023. She has a special interest in teaching and completed a Postgraduate Certificate in Medical Education (Distinction) at the University of Cambridge in 2019. Dr Dhutia is also a lecturer for the PassPACES course in London.

Abstract

Introduction

Avacopan, an oral C5a receptor inhibitor, is a novel treatment for ANCA-associated vasculitis. There are limited data regarding avacopan use in those with severe renal disease, and of 'real-world' experience using avacopan in combination remission-induction regimens. The aim of this study was to evaluate safety, glucocorticoid use and renal recovery in patients treated with avacopan in combination with rituximab and low-dose cyclophosphamide for severe ANCA-associated glomerulonephritis.

Methods

A single-centre observational cohort study of 37 patients with ANCA-associated glomerulonephritis (ANCA-GN) treated with avacopan 30mg twice daily as part of remission-induction therapy was conducted. The observation period was from December 2022 to October 2023, with median follow-up of 6 months (IQR 4-7). Data reported as median (±IQR) unless otherwise stated.

Results

Baseline features: 37 patients have been treated - their demographics are outlined in Table 1.

Age (y) - mean +/- SD	58.7 +/- 18.0
Sex - no. (%)	
Male	22 (59.5)
Female	15 (40.5)
Vasculitis disease status - no. (%)	
Newly diagnosed	28 (75.7)
Relapsed disease	9 (24.3)
ANCA status - no. (%)	
MPO-AAV	25 (67.6)
PR3-AAV	12 (32.4)

Table 1. Demographics and clinical features at baseline.

At baseline, BVAS was 16 (14-21), eGFR 23 (12-38) ml/min/1.73m^2 and urinary protein:creatinine ratio (uPCR) 156 (69-253) mg/mmol. Two patients required dialysis and 9/37 (24%) had alveolar haemorrhage.

Treatment: 31/37 patients received combination induction treatment with rituximab (2g) and low-dose IV cyclophosphamide (median dose 3.25g [0.875-3.5]). Five patients were treated with rituximab alone, and one with cyclophosphamide alone. Ten patients (27%) received adjunctive plasmapheresis. The median dose of IV methylprednisolone was 0 mg (0-500) and 32/37 patients received oral prednisolone with median dose and duration of 325mg (210-675) and 8 days (7-26), respectively.

Outcomes: The evolution of disease activity variables at baseline, 3 and 6 months is summarised in Figure 1. At 3 months, eGFR and uPCR had improved to 47 (21-75) ml/min/1.73m^2 and 28 (0-168) mg/mmol, respectively. In those who presented with eGFR ≤20 ml/min/1.73m^2 with minimum 3 months follow-up (n=15), median eGFR increased from 13 (9-18) to 22 (11-43) ml/min/1.73m^2. Six patients (16.2%) had mild infections treated with oral antibiotics and did not require hospitalisation; one patient required intravenous antibiotics for a respiratory infection.
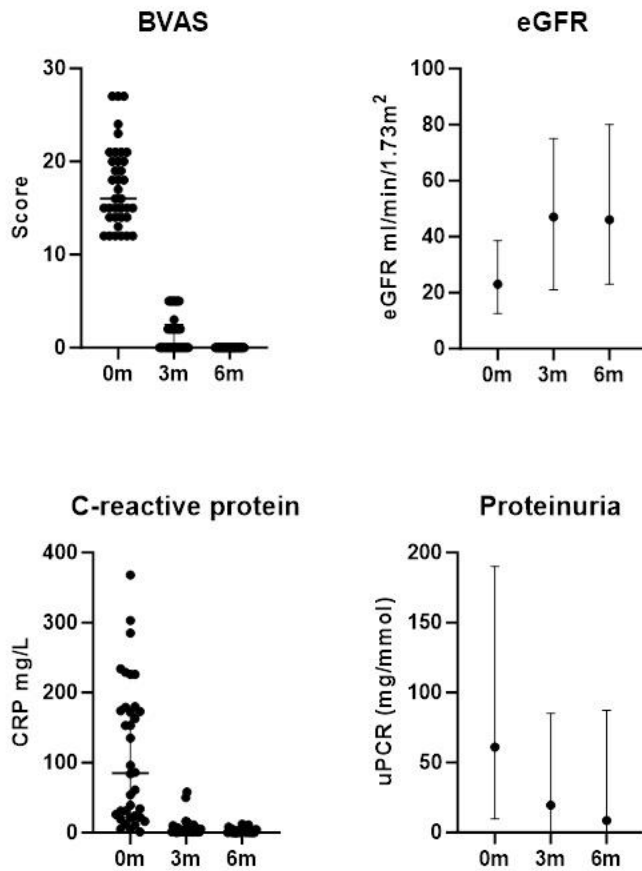
Figure 1: Evolution of activity variables (BVAS, eGFR, CRP and proteinuria) at baseline, 3 and 6 months – data shown as individual values or median with IQR.

Conclusions

This series suggests that avacopan is well-tolerated and facilitates glucocorticoid minimisation in patients with active ANCA-GN. This is in a non-trial setting, and when used in combination with rituximab and low-dose cyclophosphamide. Renal recovery was favourable in those presenting with eGFR ≤20ml/min/1.73m^2, and long-term follow-up of this avacopan-treated cohort is ongoing.

Plasma exchange in refractory IgA Vasculitis

Dr Giorgio Trivioli[1], Dr Beatriz Sanchez-Alamo[2], Dr Rona Smith[1], Dr Kevin Loudon[1], Dr Lisa Willcocks[1], Prof David Jayne[3], Dr Rachel Jones[1]

[1]Cambridge University Hospitals, Cambridge. [2]Hospital Universitario del Sureste, Arganda del Rey, Madrid, Spain. [3]University of Cambridge, Cambridge

Dr Giorgio Trivioli

Biography
Trained as a Nephrology in Florence, Italy. Interest in vasculitis and immune-mediated renal diseases. CUrrently Clinical Fellow at Addenbrooke's Hospital, Cambridge.

Abstract

Background and Aims: IgA Vasculitis (IgAV) frequently has a relapsing/refractory course despite glucocorticoids and immunosuppressive therapies and the management of severe disease remains controversial.[1] Plasma exchange (PLEX) has been used as a rescue treatment in other vasculitides, particularly in cases with rapidly progressive glomerulonephritis, but little is known about its role in IgAV. Here we present outcomes of patients with refractory IgAV treated with PLEX at our centre.

Method: Clinical records of patients who met 1990 American College of Rheumatology classification criteria and 2012 Chapel Hill Consensus Conference definitions for IgAV were analysed and those receiving ≥1 course of PLEX (5 sessions) identified from our PLEX database. We assessed demographic and clinical features at diagnosis and at starting of PLEX. Response was defined as an improvement in vasculitis activity measured with Birmingham Vasculitis Activity Score (BVAS) 1 month after PLEX course completion and classified as "partial" (BVAS<3 and prednisolone <10 mg/day) or "complete" (BVAS=0). Both definitions included changes in eGFR and proteinuria. Relapse was defined as an increase in BVAS after initial response. Early adverse events occurring during PLEX course or within one week after completion of this were recorded.

Results: Among 174 patients with IgAV, 12 (7%) received ≥1 course of PLEX. This was started a median of 15 months after diagnosis (interquartile range, IQR 3-40). All patients received glucocorticoids and immunosuppressive therapy prior to PLEX (**Table**). At the time of starting PLEX, 8/12 patients had active skin involvement (7/8 had purpura and 2/8 ulcers) and 10/12 nephritis, with a median eGFR 34 mL/min (IQR 30-43) and a median urine albumin:creatinine ratio (UACR) of 298 mg/mmol (IQR 240-486). PLEX was combined with glucocorticoids and various immunosuppressive agents, most commonly cyclophosphamide (42 %) or mycophenolate mofetil (33%). All but one patient had a response at 1 month, and this was "complete" in five (42%). The median eGFR of patients with active nephritis increased up to 44 mlL/min/1.73 m2 (IQR 36-58) and the median UACR drop to 182 (IQR 159-408). Ten patients (91%) relapsed a median of 3 months (IQR 2-7) after completion of the PLEX course and 8/10 (80%) resumed PLEX and achieved response. Six patients (50%) continued a "chronic" regimen of PLEX

(1-2 monthly sessions) for a median of 85 months (25-141), as this was the only therapy that could control skin (4/6) and/or kidney manifestations (3/6). Three patients experienced infection within a week of PLEX discontinuation and two reported reactions to FFP/albumin, but all recovered completely. Three patients (25%) developed kidney failure during follow-up and two died (one of whom had kidney failure), with death occurring 9 and 146 months after discontinuation of PLEX.

Conclusion: In this small cohort of adult patients with severe and refractory IgAV, PLEX was associated with improved disease control, stabilisation of renal parameters, and few early adverse events. The clinical response to PLEX appeared temporary, but some patients maintained remission through a "chronic" PLEX regimen. As highlighted by the high risk of death or kidney failure, more effective therapies for IgAV are needed but PLEX should be considered as a rescue treatment in severe/refractory cases.

	N=12
Female, n (%)	8 (66)
Age at diagnosis, median (IQ) – y	40 (31-53)
Elevated IgA (>2.2g/L), n (%)	6 (50)
Immunosuppressive therapy before PLEX	
Glucocorticoids, n (%)	12 (100)
Cyclophosphamide, n (%)	4 (33)
Rituximab, n (%)	2 (17)
Mycophenolate mofetil, n (%)	5 (42)
Other, n (%)	5 (42)
Age at the time of PLEX therapy, median (IQR) - y	43 (28-54)
Months since diagnosis, median (IQR)	15 (3-40)
Active organ involvement at the time of PLEX start	
Skin, n (%)	8 (66)
Joint, n (%)	2 (17)
Gastro-intestinal tract, n (%)	1 (8)
Nephritis, n (%)	10 (83)
eGFR, median (IQR) - mL/min/1.73 m2	34 (30-43)
UACR, median (IQR) – mg/mmol	298 (240-486)
Other, n (%)	2 (17)
BVAS, median (IQR)	10 (6-14)
Concomitant therapy	
Glucocorticoids, n (%)	12 (100)
Cyclophosphamide, n (%)	5 (42)
Rituximab, n (%)	1 (8)
Mycophenolate mofetil, n (%)	4 (33)
Other, n (%)	2 (17)
Outcome at 1 month	
Response (all)	11 (92)
Complete (BVAS=0), n (%)	5 (42)
Partial (BVAS<5), n (%)	6 (50)
No response, n (%)	1 (8)
eGFR (nephritis), median (IQR) - mL/min/1.73 m2	44 (36-58)
UACR (nephritis), median (IQR) – mg/mmol	182 (159-408)
Relapse, n (%)	10 (83)
Time to relapse from PLEX discontinuation, median (IQR) - months	3 (2-7)
Number of PLEX courses (5 sessions), median (IQR)	3 (2-6)
Chronic PLEX therapy (monthly for >3 months), n (%)	6 (50)
Number of sessions, median (IQR)	25 (9-42)
Early adverse effects, n (%)	5 (52)
Infections, n (%)	3 (25)
Infusion reactions, n (%)	2 (17)
Follow-up after PLEX start, median (IQR) - months	49 (32-116)
Kidney failure requiring RRT, n (%)	3 (25)
Death, n (%)	2 (17)

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Poster number: 396

Submission number: 612

A Single Centre Experience of Managing Minimal Change Nephropathy in Adults

Dr Joanna McKinnell, Ms Kirsty Swinscoe

Derby, Derby

Dr Joanna McKinnell

Biography
Consultant nephrologist working in University Hospitals Derby and Burton Foundation Trust.

Abstract

Introduction:

Minimal Change nephropathy is a common cause of nephrotic syndrome in children and adults. Although the acute presentation of nephrotic syndrome usually remits with high dose steroids frequent relapses can lead to unacceptable levels of steroid related co-morbidity. Conversely protracted periods of severe proteinuria can lead to renal dysfunction. Over the years multiple different immunosuppressive agents have been used to reduce relapses. Here we review the changing pattern of immunosuppressive treatments in our unit.

Methods:

We conducted a retrospective look at all our active cases of minimal change or nephrotic syndrome of childhood to gain an understanding of our current and historical management of the cohort. Data was collected at a single time point searching for diagnosis codes in active cases (still under active follow up). We collected data on follow up duration (within our unit), current kidney function and proteinuria. Data are reported as median and inter-quartile range (IQR).

We used searches of medication lists, current and stopped to collect information on immunosuppression in use now and previously and collected data from biochemical charts for numbers of relapses and date of most recent relapse.

Table 1

	CYCLOSPORIN	TACROLIMUS	MYCOPHENOLATE	CYCLOPHOSPHAMIDE	RITUXIMAB/ TURING IMP
CURRENT	7	3	0	0	0
PREVIOUS	12	6	3	4	13
TOTAL	19	9	3	4	13

	CNI	RITUXIMAB
GFR (MLS/MIN)	69 (52-83)	89 (53.5-102.5)
PCR (MG/MMOL)	19.8 (12.28-49.23)	14.4 (5.9-26.25)
RELAPSES	3 (2-4)	4 (3-7)
STEROID USE (MONTHS)	26 (17-95)	30 (18-37.5)

Results:

We reviewed 53 cases of minimal change of which 49 (92%) are histologically proven. Renal function is well preserved in the majority with a median eGFR of 84mls/min (IQR 64-106).

Follow up time is long at 76 months (IQR 35-102). Proteinuira is well controlled in most with only one person currently nephrotic and median 9.5mg/mmol (5.23-18.4). 13 people have PCR > 30mg/mmol often remaining high after incomplete remission.

There was wide variety in the number of relapses ranging from 0 - 12 (median 3 (IQR1-4)). Time since last relapse was a median of 21.5mths (IQR 9-52.25).

12 people are currently on prednisolone with a further 41 having had it previously although 3 prior to transfer to our unit. Steroid burden is high with a median of 24 months treatment (IQR 10.25-39.25) months and 4 people having received more than 100 months of steroids. This is an underestimate as it does not include steroid treatment given prior to transfer (eg from another centre or from paediatrics). Only 15% (8 people) had a bone density recorded and all 8 had either osteopaenia or osteoporosis. There were 3 cases of new onset diabetes after steroid use.

The high steroid use is despite the widespread use of additional immunosuppression with 32 (62%) receiving one IS agent, 12 (23%) requiring a second line and 5 (10%) needing 3rd line. (see table 1a).

The people who received Calcineurin Inhibitors (CNIs), either Tacrolimus or Cyclosporin or both sequentially, were compared with the group who received Rituximab either open label or through the Turing trial. Despite Rituximab being used second or third line (often after CNIs) this group showed lower proteinuria, improved GFR, reduced relapses and similar or reduced Steroid use (See Table 1b)

2 patients have developed solid organ cancer during the follow up period.

Conclusion

Minimal change is a heterogeneous disease with widespread variation in response to treatment and disease burden. There is significant co-morbidity associated with the prednisolone treatment in our cohort and measurement of this is poor. Over time in our unit there is a shift towards using Rituximab rather than calcineurin inhibitors and if used earlier this could reduce steroid burden and improve outcomes for renal preservation.

References

TURING | CCTU cctu.org.uk/portfolio/core/trials-open-to-recruitment/turing

Membranoproliferative Glomerulonephritis Experience over 20 years in a Tertiary Centre in the United Kingdom

Dr Hannah O'Keeffe[1], Dr Joshua Storrar[1], Dr Chethana Ramakrishna[1], Sara Metaoy[2], Dr Rajkumar Chinnadurai[1], Prof Philip A. Kalra[1], Prof Smeeta Sinha[1]

[1]Salford Royal Hospital, Northern Care Alliance. [2]University of Manchester, Manchester

Dr Hannah O'Keeffe

Biography
Hannah O'Keeffe completed Nephrology Specialist Training in Ireland. She undertook a Clinical Innovation Fellowship at Innovate Health at Tallaght University Hospital Ireland from 2021-2023. She has an MSc in Healthcare Management from the Royal College of Surgeons in Ireland. She started as a Clinical Research Fellow at Salford Royal Hospital in 2023 and is an MD candidate at the University of Manchester.

Abstract

Introduction

Membranoproliferative Glomerulonephritis (MPGN) is a histological pattern of injury which typically accounts for light microscopy findings on 1-3% of kidney biopsies. It is classified based on immunofluorescence into complement-mediated, immune complex-mediated (IC) and immunofluorescence negative. The underlying aetiologies such as C3 Glomerulopathy are rare diseases, and thus longitudinal real-world experience in terms of underlying causes, treatment and outcomes is valuable.

Methods

This study presents a retrospective review of biopsy data from January 2000 through to December 2020 in a tertiary renal referral centre in the United Kingdom (UK). This review was conducted using the organisation's biopsy database, with patient demographics and clinical information obtained from the Electronic Patient Record. All patients with an MPGN pattern on biopsy were reviewed. Those with new MPGN post-transplant, with an MPGN pattern on biopsy but subsequently diagnosed as IgA Nephropathy, and with an MPGN pattern but a known lupus diagnosis, were excluded.

Results

A histological finding of MPGN on kidney biopsy was found in 67 patients. Of these, 41 remained in the study following application of the exclusion criteria, with an additional 3 excluded as there was insufficient information available for classification in their biopsy reports. Of the 38 remaining, 28 had IC

MPGN and 10 had C3 Glomerulopathy (C3G) - 8 with C3 Glomerulonephritis (C3GN) and 2 with C3 Dense Deposit Disease (DDD).

Median follow up was 72 (range 45-126) months. Median age was 64 years in the IC MPGN and 55 years in the C3G groups (p 0.125). The majority in both groups were female, 60.7% (17) and 60% (6) respectively. There was no significant difference in renal function, blood pressure, or proteinuria at presentation between the groups. MPGN was associated with infections in 8 patients (21.1%), connective tissue disease in 3 patients (7.9%), monoclonal gammopathies or haematological malignancies in 8 patients (21.1%), and 2 had identified complement deficiencies (5.3%).

Over the study period 47.4% (18) of patients progressed to end stage kidney disease and 50% (19) died. There was no significant difference in these outcomes between the IC MPGN and the C3G groups. Progression to renal replacement therapy (RRT) was seen in 42.9% (12) of the IC MPGN group, and 60% (6) of the C3G group (p=0.287). This included two patients who received a kidney transplant (both in the C3G group), one of whom developed recurrence during the available follow up.

Discussion

This study adds a UK perspective with long term data and outcomes in a rare condition. Almost half of patients progressed to RRT and half of patients died during the follow-up period. These outcomes were seen at similar rates in those with IC MPGN and those with C3G. A variety of associated conditions were observed, and the low number of complement deficiencies identified is likely due to the historical nature of the review with reduced screening for complement abnormalities and genetics in the earlier period.

Poster number 398: WITHDRAWN

Poster number: 399

Submission number: 117

Optimizing Perioperative Care: The Impact of NURA-AKI Tool Assessment on Early AKI Risk Recognition in Surgical Patients

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Mrs Nooreena Yusop

Biography
Nooreena Yusop is a highly motivated lecturer at University College of MAIWP International, Kuala Lumpur Malaysia. Participating in advanced course for Renal, Nephrology and Dialysis. A highly trained and experienced Malaysia Registered Nurse with a demonstrated history of working in both public and private hospital in Malaysia, Saudi Arabia and Singapore, healthcare industry and executing clinical services and managerial posts. Possesses an exceeding skill in Intensive and Critical Care, Cardiothoracic Surgery, and Renal nursing care. Responsible for departmental and hospital-wide quality of service and patient safety, which involved the implementation, adherence, assessment, and analysis of processes that highly impact the quality of hospital operation and service. Strong and outstanding healthcare professional's services by background, with Master's Degree in Nursing Science and pursuing Doctorate Philosophy in Nursing

Abstract

Introduction: Acute Kidney Injury (AKI) is a prevalent and serious complication among surgical patients, contributing to increased morbidity and mortality. Early identification of patients at risk of AKI is crucial for implementing preventive measures and timely interventions. This study aimed to assess the effectiveness of the Nursing Risk Assessment of Acute Kidney Injury (NURA-AKI) tool in detecting AKI risk among surgical patients.

Methods: A prospective cohort study was conducted involving two hundred patients at Hospital Canselor Tuanku Muhriz (HCTM) Kuala Lumpur, Malaysia. The assessment was performed by seventy-five surgical nurses who had undergone AKI nursing risk assessment education program involving new admission or inter/intra facilities patient transfer; inclusive of patients who are back from operating theater (OT), emergency/elective surgery, and major/ minor surgery. The selected assessments are based on three series: one month, three months, and six months after the education program.

Results: Among the 200 surgical patients included in the study, the NURA-AKI tool demonstrated significant predictive ability for AKI risk. Using Fuzzy Logic Model (FLM) and the Fuzzy Set Membership Function to interpret the risk of AKI, the tool identified 33.5% (n=67) patients as "At Risk" of AKI, 20.5% (n=41) as "Borderline" and 46.0% (n=92) were classified as "No Risk" of AKI based on the comprehensive assessment. Subsequent analysis revealed that specific risk factors, such as hypertension, DM, cardiovascular disease, CKD, and sepsis are at high risk of AKI as correctly predicted value at 64.2% - 75.6% (p< 0.05) were significantly associated with an elevated risk of AKI. The multinominal logistic regression analysis revealed laboratory parameters such as Serum Creatinine >26.5mmol/L within 48hours, Albumin level, Proteinuria > 80g/dL as well as clinical presentation of dehydration/ blood loss has a significantly increased likelihood of being at risk of AKI (p< 0.05). Other risk factors such as type of surgery, involving cardiac procedure, and consuming nephrotoxin agents have shown statistically significant (p<0.05) to the development of AKI in surgical patients. The overall accuracy of the NURA-AKI tool in detecting AKI risk was 81.3%, showcasing its potential as a valuable screening tool in the surgical setting.

Discussion: The results demonstrate the importance of integrating the NURA-AKI tool into routine assessments for surgical patients. The findings also emphasize the potential impact of early detection on patient outcomes, as timely interventions can be initiated to mitigate the risk of AKI. Furthermore, the study highlights the role of surgical nurses in utilizing the NURA-AKI tool effectively, indicating the feasibility of its implementation in diverse clinical settings.

Conclusion: In conclusion, the NURA-AKI tool emerges as a promising instrument for detecting AKI risk among surgical patients. Implementation of the NURA-AKI tool in routine clinical practice has the potential to enhance patient care and contribute to the prevention of AKI-related complications in the surgical population. Future research should explore the long-term impact of NURA-AKI implementation on patient outcomes and healthcare resource utilization.

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Poster number: 400

Submission number: 141

A closed-loop audit examining adherence to national guidelines for the management of acute kidney injury in the inpatient population.

Dr Thomas Salisbury, Dr Shilpa Kaki, Dr Alfie Grocott, Paula Marchetti

Dr Thomas Salisbury

Biography
Dr Salisbury is an IMT3 currently working at Doncaster Royal Infirmary. He has an interest in Renal Medicine and has been working with the local Renal department over the past year to help improve management of AKI's across the trust.

Abstract

Introduction:

Acute kidney injury (AKI), both community-acquired and hospital-acquired is common and associated with high levels of morbidity and mortality. Effective interventions implemented in a timely manner improve outcomes in AKI; as such, national guidelines have been produced to ensure that standards are met. Adherence to these guidelines was examined at a trust-wide level to identify potential improvements in practice.

Methods:

A closed-loop audit examining compliance with six standards from the UK Kidney Association's AKI Clinical Practice Guideline was performed. These standards included guidance on early senior review, dipstick testing, baseline investigations, medication review, fluid therapy and consultation with specialist renal physicians. Data derived from laboratory results, physical observations and clinical notes was examined for a cohort of patients who triggered AKI 2/3 e-alerts within the Trust in Autumn 2021. Findings were subsequently presented at clinical governance meetings. Education was given at Foundation and IMT level regional teaching and information posters were distributed around clinical areas. Renal study day was organised for nursing staff and a trust Hydration committee was formed with interested parties to reinvigorate traffic light water jug system, Fluid balance and AKI awareness.The same data collection and analysis processes were then performed for a second cohort of patients from Autumn 2023.

Results:

A total of 79 patients were included within both audit cycles; 38 in the first, and 41 in the second. Within the first cohort, dipstick testing was completed in 18% of cases, fluid balance was recorded in 37% of cases, ultrasound was performed when indicated in 79% of cases, medication was reviewed in 71% of cases. Within the second cohort, dipstick testing was completed in 24% of cases, fluid balance was recorded in 56% of cases, ultrasound was performed when indicated in 77% of cases, medication was

reviewed in 78% of cases. Causes of AKI were also looked at, with the three most common being Hypovolaemia, Sepsis and Urinary Tract Obstruction, at 38%, 21% and 19% respectively.

Discussion:

This audit highlighted consistent discrepancies between adherence to different standards from the national guidelines. Medications were reviewed in a clear majority of cases, with an improvement found when comparing the 2023 cohort to that of 2021. A notable improvement was seen in the recording of fluid balance, with the proportion of cases meeting standards increasing to 56%. In contrast to the above, dipstick testing continued to be employed at comparatively low levels, although improvement was seen between audit cycles. The findings suggest that information provision has led to modest improvements in implementation of the national guidelines. To sustain this improvement, AKI education has been integrated into the trust induction for all junior doctors. Renal study day for nursing staff is now twice a year recurring event.

The next stage in this project is implementing an electronic 'AKI bundle', in which all users will be prompted to complete the bundle when an AKI is alerted on our computer system. This has been created and will be employed within the next few months.
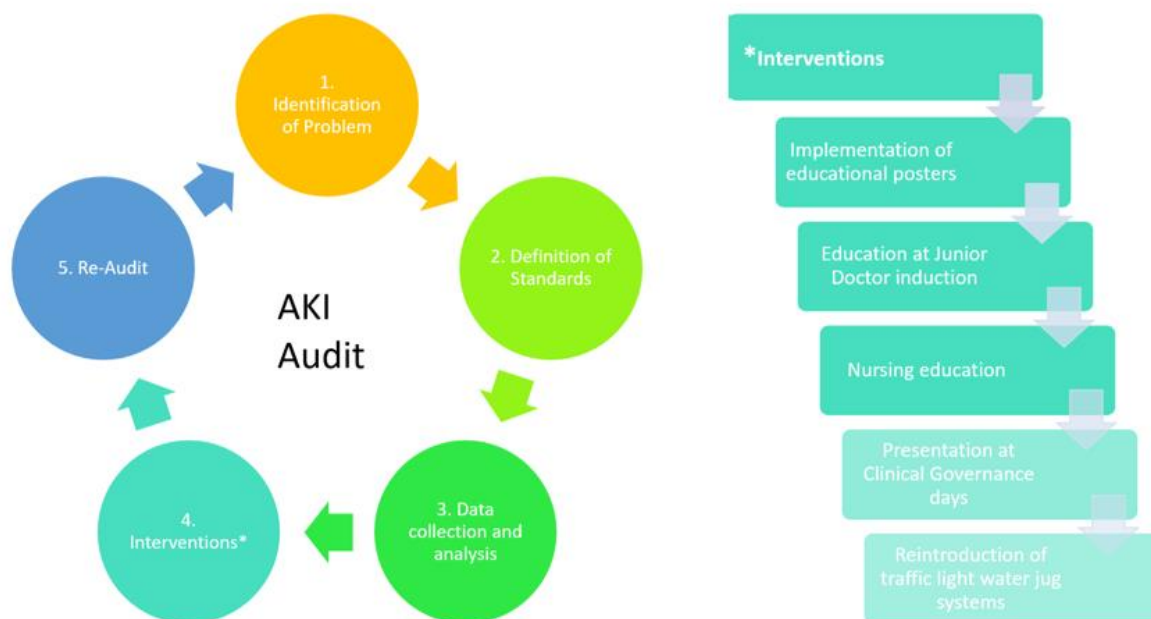
		Urine Dipstick Completed	Fluid Balance on Nervecentre	US Performed if indicated	Medication Review	Renal Function at baseline 1 month after AKI
2012	Y	87	NA	72	108	
	N	97	NA	22	70	
	%	**47.50%**	**NA**	**76.50%**	**60.70%**	**74%**
2021	Y	7	14	11	27	16
	N	31	24	3	11	9
	%	**18.40%**	**36.80%**	**78.60%**	**71.10%**	**64%**
2023	Y	10	23	13	32	17
	N	31	18	4	9	11
	%	**24.40%**	**56.10%**	**76.50%**	**78.00%**	**60.70%**

Development of a new NURTuRE (National Unified Renal Translational Research Enterprise) biobank to aid research in the study of AKI to CKD transition

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Dr Daniel Smith

Biography
Daniel Smith is a post-doctoral researcher at the Wales Kidney Research Unit, working on the discovery and validation of microRNA biomarkers in urine through PCR based methods and their subsequent detection at point of care through development of electrochemical biosensors. Daniel completed his master's MChem in Chemistry at Cardiff University in 2013 before completing his PhD between the schools of medicine and chemistry in electrochemical microRNA detection in 2017. Since that time Daniel has been a key member of the Wales Kidney Research Unit and has developed his research to include not only the production of biosensors, but the discovery and validation of new microRNA biomarkers in urine and plasma through RT-qPCR based methodologies. Daniel has also been working part-time as a virtual lecturer in pharmacology at Queen Margaret University in Musselburgh Scotland since Jan 2021, and also in project management, taking up a part time position as an assistant project manager for the upcoming NURTuRE AKI program run by KRUK in 2022.

Abstract

Introduction

Acute Kidney Injury (AKI) is a common condition, occurring in about 20% of hospital admissions,[1] with a consistent burden across the UK.[2] Patients developing AKI are at increased risk of death, prolonged hospitalisation, hospital readmission and long term complications including chronic kidney disease

(CKD), dialysis dependence, and major cardiovascular events.[3-5] As well as its impact on individual health, AKI is associated with a significant economic burden to society. [3, 6] Importantly, as a systemic complication of acute illness, patients with multi-morbidity are at increased risk of AKI, while AKI is associated with acquisition and worsening of chronic disease states beyond CKD. In addition, AKI, like CKD, disproportionately affects patients from minority ethnic backgrounds and/or with greater socioeconomic deprivation, thus perpetuating systematic healthcare inequalities. Improvements in AKI outcomes have been elusive; prompt action in more severe AKI provides the potential opportunity or therapeutic target to intervene to limit the development of chronic kidney disease.

Materials and methods

The NURTuRE ACKD (AKI to CKD) project looks to build upon the existing NURTuRE platform to establish a national centralised AKI biobank with linked data-repository. The biobank will collect blood, urine, biopsy and MRI imaging samples from adult and paediatric patients with AKI of different aetiologies across a number of timepoints to allow for tracking of the processes which promote AKI to CKD progression. A phased cohort approach will be adopted with deep clinical phenotyping and standardised pathways for high-quality bio-sample collection and storage. A multidisciplinary team involving patient representatives, clinicians and laboratory scientists will be assembled. Future research activities include biomarker discovery and validation using multi-omics,[7] with studies focused on enhanced understanding of pathophysiological mechanisms of AKI, enabling clinical trials of novel interventions.

The proposed biobank will utilise samples collected from a number of centres across the UK, including sites in Cardiff, Birmingham, London, Leeds, Liverpool, Derby, Nottingham and Glasgow. Urine, blood and biopsy samples will be collected as part of the biobank while MRI images of the kidney during AKI will also be collected as part of an internal sub-study. The biobank aims to collect bio-samples from 400 adult patients with general AKI, 400 adult patients with cardiac surgery associated AKI and 150 paediatric patients with cardiac surgery associated AKI. These samples will be collected at multiple timepoints, aiming for more than 4500 different collections and thus over 432,000 aliquots. While in the initial phases the analysis will be restricted to those who are currently part of the consortium, the residual samples and data will be made available to the wider community at the end of the recruitment period.

Results

This cohort will have huge implications for our understanding of AKI and it's progression to CKD, with the potential to facilitate new research avenues to better prognose and treat patients. This new arm of NURTuRE builds on the existing NURTuRE CKD (2996 patients) and idiopathic nephrotic syndrome (INS, 739 patients) cohorts which have already collected over 266,000 blood and urine aliquots, and will be open for access applications from early 2024 and has already resulted in new discoveries and publishable data.[8]

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Poster number: 403

Submission number: 326

Novel approach to AKI management in a District General Hospital

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Morriston Hospital, Swansea

Dr Sharan Chugani

Biography
A Renal Specialist Registrar in his 4th year of training who is undertaking a fellowship in clinical leadership and value-based healthcare at Glangwili Hospital, Carmarthen. A lover of the outdoors including hiking, running as well as playing cricket and tennis. He takes a keen interest in music and is learning to play the saxophone. He also enjoys astronomy and goes star-gazing on clear nights as well as taking night-sky photographs.

Abstract

Introduction

Acute kidney injury (AKI) is associated with significant morbidity and mortality. An all-Wales study over 6 months showed an incidence of 577/100,000 population and 90-day mortality 25.6%. The 2009 NCEPOD report estimated 20% of AKIs are preventable.

In Carmarthen (a DGH), renal services are provided from Morriston hospital through the satellite dialysis unit. AKI referrals are dealt with by renal consultants twice weekly and by the dialysis unit doctor when present. No Consultant cover exists to regularly manage severe AKIs. Teams rely on telephone advice from the renal team in Morriston. AKIs needing acute dialysis are managed in ITU and transferred to intermittent dialysis on the satellite unit when possible.

The aim of our approach was to add novel strategies to the existing template in Carmarthen, improve AKI outcomes, prevent unnecessary transfers to ITU and the Morriston renal unit. This project was conceived when a renal registrar secured a fellowship in February 2023.

Methodology

PDSA cycle was applied to our planning of the project. Meetings with all speciality leads to disseminate information about the proposed project.

Collaborated with IT to develop an intranet Renal database to provide:

- Educational resources,
- Online referral tool,
- Virtual ward for monitoring AKIs & HOT clinic patients.

Engaged with the education department providing targeted teaching to junior doctors through AKI lectures, case-based discussions and simulation workshops.

Developed a pathway for medical teams to identify and refer AKIs promptly, including an AKI column on their on-call lists. These were reviewed daily by the renal registrar.

Provisions were made on the satellite unit for line insertion to dialyse AKIs during working hours.

Setting up of a HOT clinic to review AKI patients following discharge.

A risk stratification tool for patients with AKI was developed and is being applied retrospectively.

Results

Over five months, 102 patients were identified with AKI at Glangwili Hospital. The table illustrates how they were identified and their outcomes:

AKI In-Reach Service				
Referral Source		Number	AKI type	
	Clerking list	64		Pre-renal/ATN: 75
	Ward	26		Intra-renal: 20
	SDEC	1		Post-renal: 7
	ITU	11		
Progress			AKI severity	
	Acute dialysis	4		1: 35
	Single organ filter	1		2: 18
	Filter prevented	10		3: 49
Outcome				
	Full recovery	51		
	Partial recovery	25		
	RIP	23		
	Chronic dialysis	3		
HOT clinic				
	Total reviews	56		
	Discharged	3		
	Referred CKD	3		
	Average weekly reviews	4		

The AKI teaching series consisted of a lecture, smaller group case-based and simulation sessions. The lecture was well attended with positive feedback, but the small group sessions only mustered 25% attendance.

AKI cases were discussed at grand round meetings to reinforce AKI principles.

Discussion

A renal in-reach service was created at Glangwili Hospital, Carmarthen to provide more tailored support to identifying patients with AKI, investigating appropriately and initiating treatment promptly to reduce morbidity and mortality.

Our aims were:

- Help teams prevent progression of pre-renal AKI to Acute Tubular Necrosis and dialysis dependent AKI,
- Detect renal AKIs earlier,
- Avoid ITU admissions for haemofiltration in single organ failure,
- Offer accelerated stepdown dialysis in those filtered on ITU.

Of the patients reviewed during the 5
month period, one patient required single organ haemofiltration, due to there being no renal in-reach service available on the day.

Twenty-four patients were prevented from being transferred to Morriston and their care managed in Carmarthen.

Three patients were transferred to Morriston for tunnelled lines.

Ten ITU and Morriston bed and dialysis days were saved through acute dialysis on the satellite unit. Ten further patients were also prevented from re-commencing filtration in ITU following referral to the in-reach service.

Seventy-five percent of patients made full or partial recovery whilst mortality was twenty-three percent.

The teaching series garnered positive feedback on survey. Most individuals highlighted rota clashes, being short staffed and having unwell patients for not attending.

Our goals to improve the in-reach service include:

- Establishing an AKI dashboard on the hospital intranet,
- Implementing an AKI risk stratification tool in the medical clerking proforma,

- Use point of care ultrasound to aid in fluid management.

Conclusions

Our approach resulted in no patient transfers to tertiary renal services. Only one patient required support for single organ renal failure. The AKI teaching series and grand round presentations raised awareness about AKI and the importance of timely investigation and management.

References

CKS (2023) *NICE.* Available at: https://cks.nice.org.uk/topics/acute-kidney-injury/background-information/prevalence/ (accessed: 10th January 2024)

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Poster number: 404

Submission number: 328

Uncovering the uncaptured: Exploring characteristics and outcomes of Acute Kidney Injury cases missed by the NHS England AKI algorithm due to an absent baseline creatinine

Ms Esther Wong[1,2], Dr Anna Casula[1], Dr Rachael Hughes[2], Dr Rosie Cornish[2], Prof Kate Tilling[2], Prof James Medcalf[1,3,4]

[1]UK Renal Registry, UK Kidney Association. [2]Bristol Medical School (PHS), University of Bristol. [3]University Hospitals of Leicester NHS Trust, Leicester. [4]University of Leicester, Leicester

Ms Esther Wong

Biography
Esther Wong is a biostatistician with over six years of experience at the UK Renal Registry. Driven by a passion for medical statistics and a commitment to enhancing patient outcomes through data analysis, she has a keen interest in the public health implications of Acute Kidney Injury (AKI). Esther is concurrently pursuing a part-time PhD at the Bristol Medical School at the University of Bristol, focusing on the application of multilevel modelling to the area AKI rate in the presence of missing data.

Abstract

Introduction:

This study investigates the limitations of the NHS England Acute Kidney Injury (AKI) algorithm in capturing the full spectrum of potential AKI cases through electronic AKI alerts (1). The AKI algorithm calculates the change in creatinine using two results. It suggests repeating a blood test for patients with creatinine that exceeded the reference interval, but did not have a creatinine result in the past year as a baseline and flagged them as "?AKI?CKD", as they were undetermined as AKI or Chronic Kidney Disease (CKD) (Figure 1). According to the NICE guidelines, adults with a test indicating decreased kidney function should undergo a repeat assessment or blood test within 14 days, to exclude causes of acute deterioration of kidney function (e.g. AKI)(2). This study investigated the size and outcome of the uncaptured AKI population, the potential impact on AKI patients who did not receive a timely AKI alert due to the absence of baseline creatinine results, and the need for a targeted focus on this group.

Methods:

Utilising creatinine results from a single laboratory in 2019, we generated AKI stage 1, 2 and 3 alerts and "?AKI?CKD" flags (Figure 1). We examined the "?AKI?CKD" flag for patients in detail, assessing their 14-day and 90-day outcomes from the time of flagging through a flowchart, and categorising patients into two groups, "?AKI" and "?CKD". Mortality was compared to patients with AKI stage 1, 2, and 3 alerts. Patient outcomes were tracked by linking data to Hospital Episode Statistics (HES) data.

Results:

There were 31,836 AKI alerts and flags generated from 13,904 patients. This study focuses on the subset of 3,466 patients flagged as "?AKI?CKD" (Figure 2), representing the potential uncaptured AKI cases. Among these cases, their 90-day mortality was 6%, compared to 21% observed in patients with AKI alerts. The summary pie chart in Figure 2 shows the "?AKI?CKD" patients in two groups. The red group represents potential AKI patients (?AKI), where only 10.6% were not captured by the AKI algorithm at the earliest possible time. This includes those who died within 90 days without a further blood test, for which their median eGFR was 36.3 ml/min/1.73 m^2 [IQR 31.4-44.0] and the median age was 83 [IQR 70-92]. The yellow group represents those not identified as such, given their creatinine levels were higher than the reference level, the absence of AKI alerts and better mortality outcomes, we assume they are potential CKD patients (?CKD). This study also suggests that the NHS England AKI algorithm prompted nearly one-third of the "?AKI?CKD" patients to undergo another blood test within 14 days. However, almost a third of patients did not undergo any further blood tests within a year.

Discussion:

The overall mortality among patients with "?AKI?CKD" flags was notably lower than that of confirmed AKI patients. Based on their outcomes, only a small percentage of patients who received an "?AKI?CKD" flag during their initial kidney function assessment had an AKI alert subsequently, suggesting that the impact of potentially missed AKI cases due to the absent baseline creatinine may be minimal. Further work is planned to confirm if this result is generalisable.

Figure 1 The NHS England AKI algorithm, the red square indicates the potential uncaptured AKI patients due to the lack of baseline creatinine with "?AKI?CKD" flag
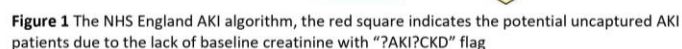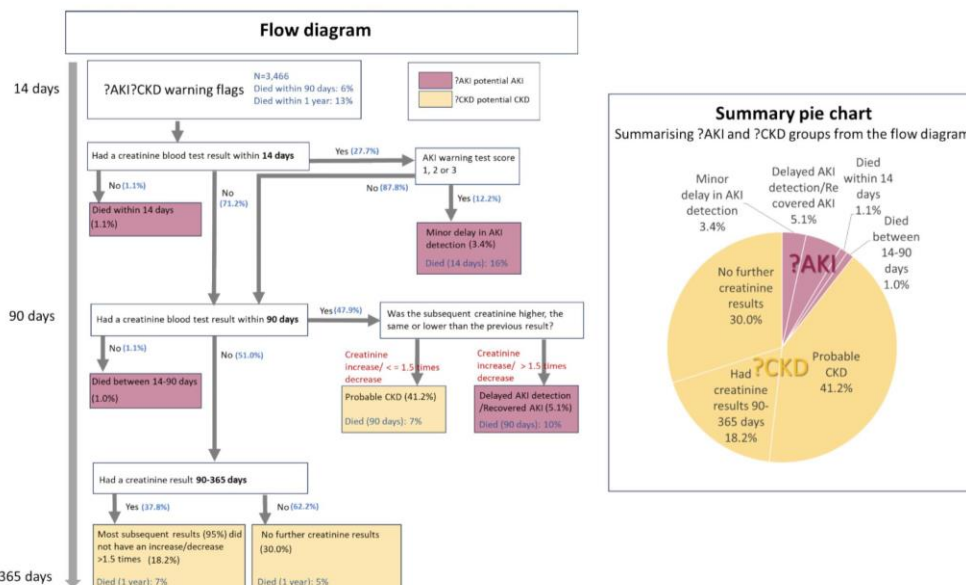
Figure 2 Flow diagram illustrating the 14-day, 90-day and 365-day outcomes of potential uncaptured AKI patients flagged as "?AKI?CKD", accompanied by a summary pie chart indicating their classification as potential AKI (?AKI) or potential CKD (?CKD) patients based on their subsequent creatinine and vital status.

References

1. NHS England, Algorithm for detecting Acute Kidney Injury (AKI) based on serum creatinine changes with time https://www.england.nhs.uk/wp-content/uploads/2014/06/psa-aki-alg.pdf
2. National Institute for Health and Care Excellence (NICE), Chronic kidney disease: assessment and management, 25 August 2021, https://www.nice.org.uk/guidance/ng203/chapter/Recommendations#frequency-of-monitoring

Poster number: 405

Submission number: 351

To dip or not to dip: a local quality improvement project aimed at improving acute kidney injury management

Dr Lisa Bradwell, Dr Timothy Woodhead, Nicola Geraghty, Dr Yasser Ashraf

Calderdale Royal Hospital, Halifax

Dr Lisa Bradwell

Biography
Graduated from Imperial College in 2018, currently an IMT2 in Leeds Teaching Hospitals NHS Trust and aspiring renal physician.

Abstract

Introduction

Acute Kidney Injury (AKI) has a high incidence and mortality in acutely hospitalised patients. NICE quality standard 76 (2014)[1] states all people with AKI should have urinalysis performed as soon as detected or suspected. AKI bundles may help improve management of AKI by efficiently and conveniently signposting clinicians to essential investigations (including urinalysis) and guide appropriate onward specialty referral to the renal service.

Objectives

1. 100% of hospitalised patients with AKI should have a documented urinalysis result.
2. Increase usage of the local AKI bundle

Methods

Regular snapshot audits of all inpatients on the Medical Admissions Unit and two elderly medicine wards (94 beds in total) in Huddersfield Royal Infirmary. Identification of all patients with AKI (as defined by KDIGO criteria[2]) during the current admission. Scrutiny of the Electronic Patient Record (EPR) to extract relevant data points. Analysis using Microsoft Excel. Survey of medical staff to ascertain awareness of indications for urinalysis and use of existing trust AKI bundle. This automatically triggers urinalysis, fluid balance recording and pharmacist review for nephrotoxic medications and allows clinicians to request relevant bloods and imaging as necessary.

Results

13 runs were completed between September 2022 and July 2023 at regular intervals. 197 patients with AKI were identified, median 15 per run (IQR 12-18)

First Cycle

In the initial pre-intervention period (6 runs, Sept 2022-Jan 2023) a median of 6.7% of patients had a documented urinalysis result. In a survey of 36 clinicians 47.2% believed patients over 65 years of age should never have urinalysis performed. We introduced a physical poster in clinical areas to clarify when urinalysis should be performed entitled 'To Dip or Not To Dip'.
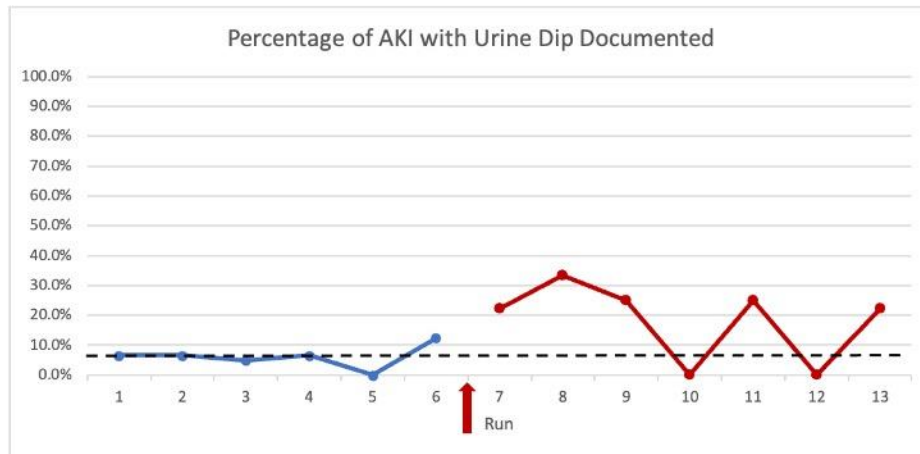
Figure 1: Run chart of urinalysis documentation. Dotted line - pre-intervention median, arrow - intervention.

Figure 2: Poster regarding indications for urinalysis, first intervention

Second Cycle

4 further runs of data were collected, with a median of 23.6% urinalyses completed per run. A median of 0% (mean 1.5%) AKI bundles were implemented across all 10 runs. Our second intervention comprised a second poster promoting the benefits of the trust AKI bundle, electronic distribution of both posters on trust screensavers and via mass email to clinical staff, and delivery of a teaching session to junior doctors.
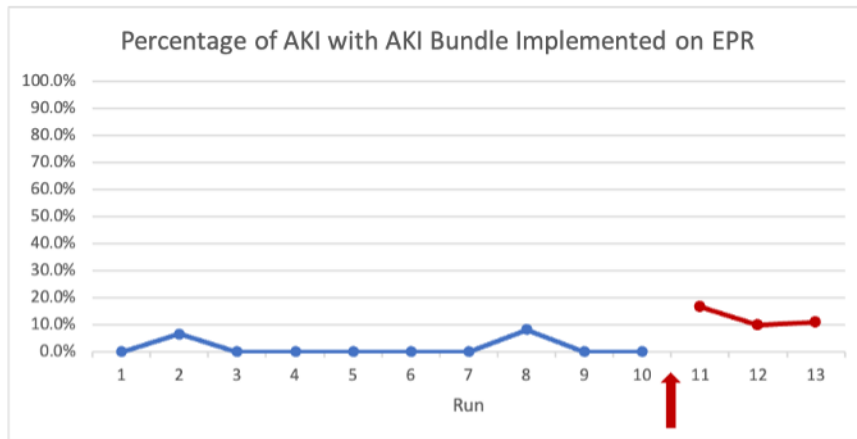
Figure 3: Run chart displaying percentage with AKI bundle implemented. Arrow - intervention.
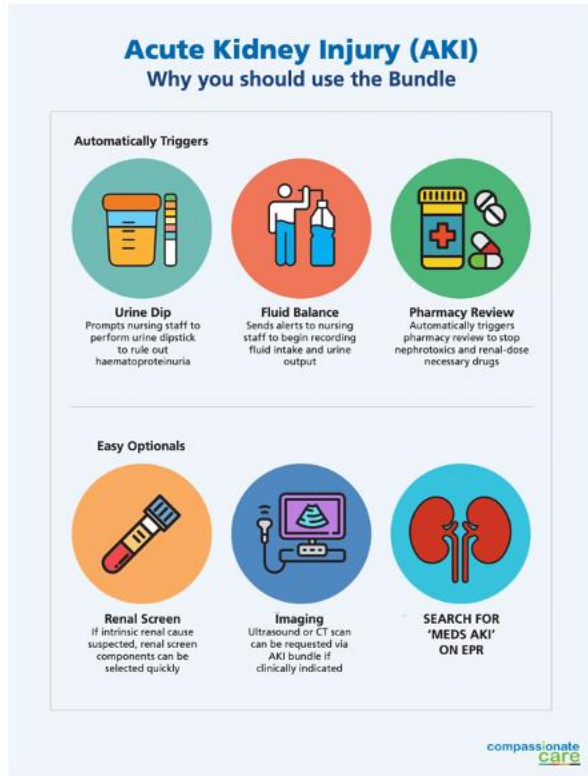
Figure 4: Poster promoting local AKI bundle as part of second intervention

Third Cycle

3 further runs were completed, returning a median 11.1% (mean 12.6%) of patients with AKI bundles implemented on EPR. We presented our data across the total period to the local clinical governance to highlight our findings and interventions to the management body. Recommendations included recirculating posters and continuing plans to introduce point-of-care fluid balance monitoring. Further data collection is ongoing to close the loop.

Discussion

There was an overall increase in urine dipsticks performed (median 15.6%) and AKI bundles (median 11.1%) implemented. Urinalysis remained short of the NICE standard. Knowledge of the indication for urinalysis in AKI amongst medical staff was poor. We encountered systemic difficulties including limited availability of urine dipsticks and difficulty with documentation within EPR. Repeated delivery of these messages will be required to sustain change.

Conclusion

Small scale local interventions resulted in improvement in patient care. Further work to sustain the change is necessary, particularly to address systemic barriers and clinician education.

References

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2. Kellum JA, Lameire N, Aspelin P, Barsoum RS, Burdmann EA, Goldstein SL, Herzog CA, Joannidis M, Kribben A, Levey AS, MacLeod AM. Kidney disease: improving global outcomes (KDIGO) acute kidney injury work group. KDIGO clinical practice guideline for acute kidney injury. Kidney international supplements. 2012 Mar;2(1):1-38.

Poster number: 406

Submission number: 391

Robust Rat and Mouse Models of Bilateral Renal Ischaemia Reperfusion Injury

Dr Tanya Smith[1,2], Miss Aeliya Zaidi[1,3], Dr Gilda Pino-Chavez[1], Professor Timothy Bowen[1], Dr Soma Meran[1], Professor Donald Fraser[1], Professor Rafael Chavez[1], Mr Usman Khalid[4,1]

[1]Wales Kidney Research Unit, School of Medicine, Cardiff University, Cardiff, UK. [2]Department of Anaesthetics, Cardiff & Vale University Health Board, Cardiff, University Hospital of Wales, Cardiff, UK. [3]Cardiff Transplant Unit, Nephrology & Transplant Directorate, Cardiff & Vale University Health Board, University Hospital of Wales, Cardiff, UK. [4]Cardiff Transplant Unit, Nephrology & Transplant Directorate, , Cardiff & Vale University Health Board, University Hospital of Wales, Cardiff, UK

Mr Usman Khalid

Biography
Mr Usman Khalid is a Consultant Transplant and Organ Retrieval Surgeon at The University Hospital of Wales in Cardiff and an Honorary Senior Lecturer at Cardiff University. Usman graduated from Imperial College London in 2007 and trained in London, Oxford and Wales deaneries. He gained his certificate of completion in General Surgery with specialization in Transplantation and Organ Retrieval Surgery in August 2020. His clinical interests include kidney transplantation, laparoscopic living donor nephrectomy, multiorgan retrieval surgery, dialysis access and elective general surgery. His main research interests are in understanding the underlying mechanisms of Kidney Ischemia Reperfusion Injury, an inevitable consequence of transplantation, and identifying effective interventions. in In 2006, Usman completed his PhD studies investigating the roles of microRNAs in kidney injury in the context of Kidney Transplantation. His post-doctoral research has developed further in vivo models of kidney injury and testing novel therapies.

Abstract

Background: Kidney disease remains a leading cause of morbidity and will soon become the 5th leading cause of death worldwide. To advance our understanding in the pathophysiology of kidney disease, a reliable *in vivo* model is essential. Here, we describe systematic optimisation of bilateral kidney IRI across multiple time points in mice and rats. This model critically displays acute to chronic kidney injury progression, which is reversible through novel therapeutic strategies such as ischaemic preconditioning; enabling researchers to investigate and test novel treatments for kidney disease.

Methods: We have optimised this model in adult male Lewis rats and wildtype (C57BL/6) mice. This surgical model of IRI is performed via a midline laparotomy approach in which warm ischaemia is induced to both kidneys by bilateral clamping of the renal vascular pedicles for a pre-determined duration (20-30mins for mice and 45 mins for rats). This enables researchers using this model to simulate varying severities of hypoxic injury, the common clinical aetiology of IRI.

Results: Bilateral IRI results in structural and functional kidney injury demonstrated by histology damage scores, serum creatinine levels, and kidney injury biomarker levels (NGAL and KIM-1). Furthermore, we have carefully characterised the ischaemia time-dependent response in the mild – moderate severity model.

Conclusion: Our data showed a time–dependent stepwise increase in severity that permits the study of both acute and chronic kidney disease, and the transition between these two disease states. This model of bilateral kidney IRI is reliable, reproducible and has been carefully optimised for single operator use.

Long-term kidney failure following acute kidney injury in a national cohort of children.

Dr Megan Athersmith[1], Dr Jacqueline Sit[2], Dr Lucy Plumb[3,4], 2. Anna Casula[5], Dr Carol Inward[4], Dr Manish Sinha[6], Jelena Stojanovic[6], Dr James Medcalf[7], Prof Dorothea Nitsch[8]

[1]Royal Manchester Childrens Hospital, Manchester. [2]Southampton Childrens Hospital, Southampton. [3]University of Bristol, Bristol. [4]University Hospitals Bristol NHS Foundation Trust, Bristol. [5]UK Renal Registrary, Bristol. [6]Great Ormond Street Hospital, London. [7]University Hospitals of Leicester NHS Trust, Leicester. [8]London School of Hygiene and Tropical Medicine, London

Abstract

Introduction

In children, there is growing evidence of the consequences of AKI but little is known about the risk of long-term kidney failure development. Adult studies have shown that risk increases in a graded manner with AKI severity. In NHS laboratories in England, electronic AKI alerts generated by relative rises in serum creatinine are sent to the UK Renal Registry for reporting; subsequent linkage to the kidney failure dataset provides a unique opportunity to explore AKI outcomes nationally. Our aim was to examine a cross-section of children in England with AKI and determine the risk and demographic and clinical factors associated with subsequent long-term kidney failure development.

Methods

All children aged <16 years old for whom an AKI e-alert was received by the UK Renal Registry between 1/1/2016-31/12/2019 were included and linked to Hospital Episode Statistics (hospital record for England) and the UK Renal Registry kidney failure dataset. Children already established on long-term (>90 days) kidney replacement therapy (KRT) and those who died before 90 days were excluded. The outcome of interest was the need for long-term KRT between 1/1/2016-31/12/2020 following an AKI episode. Baseline characteristics of the study cohort are presented and differences in demographic and clinical characteristics between children who did and did not develop established kidney failure were compared.

Results

48,932 AKI episodes were received for 37,660 children in England during the study period. Following exclusions (*n*=5079 children; 1 death), 42,706 AKI episodes in 32,581 children were included for analysis. In total 276 children (0.8%) who received an AKI alert were identified in the kidney failure dataset. Children who developed long-term kidney failure were older (median age 10.8 versus 4.4 years) and more likely to be of Asian ethnicity (25% versus 12%); they also experienced more AKI episodes during the study period compared to those who did not (3+ episodes in 25.0% versus 7.0%). Among all

episodes, Stage 3 AKI was more common among children later requiring long-term KRT, both at start and peak, with four-times longer median duration of AKI. However, of those who had an AKI stage 3 at start, 7.1% required long-term KRT. Among first AKI episodes, higher proportions of community-acquired AKI were noted for those requiring long-term KRT compared to those who did not (46.0% versus 33.0%).

For the 276 children who subsequently required long-term KRT, the median time from last AKI episode to KRT start was 83 (IQR 25, 352) days. The most common underlying kidney diagnosis was tubulointerstitial disease (37.0%) followed by glomerular disease (30%). Most children commenced KRT on dialysis (86.2%).

Discussion

Over a 5-year period, the risk of developing long-term kidney failure following AKI for children in England was 0.8%. Duration and severity of AKI were associated with subsequent kidney failure development. This is the first national study to be able to examine these associations and will support clinicians in assessing long-term prognosis following AKI. Interventions to reduce AKI disease progression may help lower the incidence of long-term kidney failure.

Poster number: 408

Submission number: 396

A systematic review of the use of cystatin C versus creatinine to estimate GFR in the assessment of renal recovery following AKI

Dr Jonathan Bowley[1], Dr Kerry Horne[2], Professor Nicholas Selby[3]

[1]University of Nottingham, Nottingham. [2]University Hosptials of Derby and Burton NHS Trust, Derby. [3]University Hospitals of Derby and Burton NHS Trust, Derby

Dr Jonathan Bowley

Biography
Dr Bowley is an academic foundation trainee working in the East Midlands. His academic placement is with the renal team at the Royal Derby Hospital through the University of Nottingham.

Abstract

Introduction Cystatin C has been proposed as a more accurate biomarker than creatinine for estimating glomerular filtration rate (eGFR), particularly in the context of change in muscle mass, but has not been extensively studied when assessing recovery of kidney function after AKI. The follow up of AKI is an important area for further research due to the risk of long-term morbidity and mortality, and accurate assessment of kidney function underpins this. We therefore undertook a systematic review to examine the current evidence-base on this topic.

Method The study design was registered on the PROSPERO database prior to commencing the literature search (ID 500788). Three databases (MEDLINE, PubMed and Embase) were searched from inception through to 10/1/24. Search terms used were "acute kidney injury" [title/abstract] OR "acute renal failure" [title/abstract] OR "acute renal insufficiency" [title/abstract] OR "AKI" [Title/Abstract] AND "Cystatin*" [Title/Abstract]). We included studies that reported paired cystatin C and creatinine estimates of eGFR following an episode of AKI in hospital in adults or children. Risk of bias was assessed using the Newcastle Ottawa Scale.

Results A total of 2769 papers were identified through literature search and after duplicate removal 1279 studies remained. After full-text screening, six studies were included, three of which were in adult populations and three were paediatric. Study characteristics and reported eGFR values can be seen in Table 1 below. No studies included measured GFR and both the study populations and follow up intervals varied. In all measurements in adult patients median cystatin C estimates of eGFR were lower than creatinine (2 studies) and combined creatinine-cystatin eGFR estimates were lower than creatinine alone (1 study). The eGFR Cystatin for adult patients was between 6.8-34.6ml/min/1.73m^2 lower than eGFR creatinine values. The same pattern was true for all measurements in the paediatric populations and the difference between eGFR estimates was between 14.7-33.6ml/min/1.73m^2 with cystatin estimates again being lower.

Discussion eGFR cystatin is consistently lower than the eGFR creatinine when measured during follow up after AKI. We propose that the most likely reason is that creatinine overestimates kidney function recovery due to loss of muscle mass during hospital admission, and that this is a common occurrence in AKI survivors. However, the current evidence is limited, and arises from critical care adult patients and paediatric populations, and data are required from more generalisable cohorts. Future research should also include comparisons against measured GFR to assess the accuracy of different estimating equations, and against measures of muscle mass to determine whether this explains the differences observed.

Author, Year	Design	Population	Timing of Follow-up	eGFR cystatin	eGFR creatinine
Nateghi-Haredasht, 2022	Prospective Cohort	Adult ICU patients (n=101)	3 months (75 patients), 6 months (61 patients), 9 months (48 patients), 12 months (40 patients)	1st - 37 (IQR 16.3), 2nd – 43.5 (IQR 19.1), 3rd – 45.7 (IQR 19.6), 4th - 51.8 (IQR 19.2)	1st - 50.2 (IQR 39.4), 2nd - 55.8 (IQR 27.9), 3rd - 52.5 (IQR 40.2), 4th - 67.4 IQR (34.1)
Rimes-Stigare et al, 2018	Prospective Cohort	Adult ICU patients (n=201)	3 months	51.4 (IQR 35.8-69.9)	(86 IQR 59.6-101.4)
Harer et al, 2017	Prospective Cohort	Preterm infants (n=20)	unreported	96.3 (83.8-119)	111 (100-120)
Sethi et al, 2017	Prospective case-control	Paediatric patients who received cardiopulmonary bypass or cardiac surgery (n=44)	41 months (IQR 30-64)	90.8 (83.8–100.2)	108.41 (96.2–124.28)
Menon et al, 2014	Retrospective cohort	Paediatric patients exposed to nephrotoxic medications (n=77)	6 months	80.2 (SD 23.4) - 52 subjects (either bone marrow or liver transplant pts)	113.8 (SD 30.6) 77 subjects
MacLaughlin et al, 2019	Feasibility	Adult patients (n=79)	<4 weeks, 3, 6, 9 months	Not reported – eGFR creatinine + cystatin used	Reported separately for different groups

Table 1. Study characteristics and reported eGFR values of included studies

Study Registration Number

PROSPERO ID 500788

Poster number: 409

Submission number: 100

Tolvaptan use in a patient with TSC2 - PKD1 contiguous gene deletion syndrome – case report

Dr Yusuf Jinadu[1], Dr Emily Craft[2], Dr Osasuyi Iyasere[1,3]

[1]John Walls renal unit, University Hospitals of Leicester NHS Trust. [2]Depart of Clinical Genetics, University Hospitals of Leicester NHS Trust. [3]Department of Cardiovascular sciences, University of Leicester

Dr Osasuyi Iyasere

Biography
Consultant Nephrologist and Honorary Senior Lecturer

Abstract

Introduction

The TSC2 gene is contiguous to the PKD1 gene on chromosome 16. A large deletion in this region is associated with a clinical phenotype involving features of tuberous sclerosis and polycystic kidney disease (TSC-PKD CGD). While Tolvaptan use in patients with autosomal dominant polycystic kidney disease is well established, it is less so in those TSC-PKD CGD syndrome, with only one published case report. Here, we report a case of Tolvaptan use in a patient diagnosed with TSC - PKD CGD using micro-array testing.

Methods

A 23-year-old woman transitioned from the young adult clinic to the renal genetics' clinic, having been under follow up with a known diagnosis of tuberous sclerosis for 8 years. She was known to have epilepsy, cerebral astrocytomas, facial angiofibromas, retinal hamartomas and a mild learning disability. There was no evidence on angiomyolipomas on renal imaging. Instead, she was found to have enlarged polycystic kidneys (Estimated total kidney volume of 1689 mls). Her renal function was preserved up until 20 years of age. Subsequently, she sustained a rapid decline in kidney function, prompting discussion about eligibility of tolvaptan. On suspicion of a contiguous gene deletion syndrome, micro-array testing was arranged. This confirmed the presence of a large deletion involving the TSC2 and PKD 1 genes respectively. She was commenced on Tolvaptan therapy after appropriate counselling.

Results

She was commenced on a subtherapeutic dose of Tolvaptan (15mg BD), to assess tolerability. This is being cautiously titrated for efficacy. While she experienced some polyuria, there have been no episodes

of dehydration, hypernatraemia or acute liver injury. The rate of decline in kidney function appears to have reduced with the onset of Tolvaptan (Figure1).

Discussion

In this case of TSC-PKD CGD syndrome with rapid decline in kidney function, Tolvaptan use has been well tolerated, without serious adverse effects. A longer period of observation is required, to be certain of its impact on kidney function. However, initial results are encouraging.
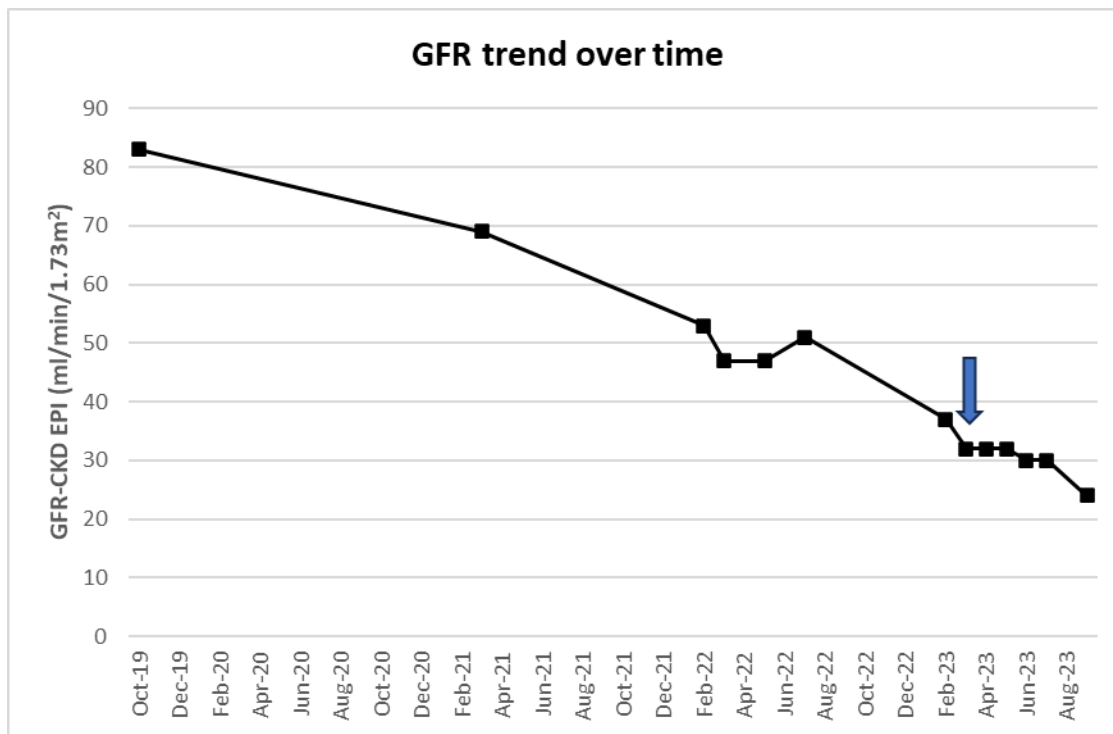
Figure 1: GFR trend pre and post Tolvaptan onset (depicted by blue arrow).

Poster number: 410

Submission number: 129

Crohn's mediated IgA-Goodpasture's disease

Dr Rebecca Ryan, Dr Thomas Fairhead, Dr Sophie Seager, Dr Rauri Clark

Sunderland Royal Hospital, Sunderland

Dr Rebecca Ryan

Biography
Newcastle university graduate, completed core and higher specialty medical training in the Northern Deanery, currently working as an ST7 in Nephrology with an interest in glomerulonephritis and vasculitides.

Abstract

53 male with distal Crohn's disease presents with active colitis having failed to respond to 3x biologic therapies. This was complicated by an AKI and proteinuria with uPCR of 200.

The patient deteriorated about one week into his admission, having been managed with glucocorticoids for the Crohn's flare, he developed dialysis dependent renal failure, haemoptysis and respiratory failure requiring CVVH and non-invasive ventilation in critical care.

The patient's auto-antibody screen (including Anti-GBM ELISA) was negative.

Once transferred to a renal unit, a kidney biopsy was undertaken which revealed a focal acute necrotising GN on light microscopy and linear GBM IgA staining on immunofluorescence (no IgA staining in mesangium and no IgG staining) in keeping with an IgA-anti-GBM disease.

After MDT discussion, the formulated management plan was to proceed with a semi-elective total colectomy with follow-on immunosuppression with cyclophosphamide and glucocorticoids. However, the disease remitted spontaneously. The colectomy took place but the need for ongoing immunosuppression was negated.

There are a very small number of reports of IgA-Anti-GBM disease reported in the literature, this case is unique in that the clinical outcome was excellent despite having presented with severe disease. In all other reported cases, when the patient presented with dialysis dependent renal failure, they either died or remained on long term RRT.

In this case, the Anti-GBM serum antibogy was negative because the ELISA assay detects IgG, whereas this was IgA mediated.

The link between inflammatory bowel disease and IgA nephropathy is well established with inflammation in the bowel causing GALT to abnormally glycosylate IgA1, these higher levels of

circulating galactose-deficient IgA1 then form complexes with IgG and deposit in the mesangium of the glomeruli. The linear deposition of the IgA along the GBM, suggesting there has been antibody formation to the NC1 terminal of the alpha-3 chain of type 4 collagen within the basement membrane, rather than mesangial deposition, is atypical in this case.

The disease trajectory of this case is more in line with the case series of "atypical anti-GBM disease" although these patients present with classical histological features of anti-GBM disease IgG linear deposition on immunofluorescence, as in this case they are serologically antibody negative (thought to be due to either low circulating titres or antibody-antigen complexes which are primarily bound within the GBM instead). These patients, however, usually present with much milder disease phenotype, unlike this case.

Whilst the exact pathophysiology of this case is elusive, our feeling is that the Crohn's disease flare was the immune priming event to trigger formation of abnormal IgA complexes, resulting in the IgA deposition along the GBM and IgA mediated goodpastures disease. Both the diagnosis and the excellent clinical outcome are novel, remission without the need for immunosuppression has not been previously reported.

Poster number: 411

Submission number: 140

Metastatic epithelioid angiomyolipomata - a case report

Dr Mohana Das, Dr Mary Ferrier

Freeman Hospital, Newcastle upon Tyne

Abstract

Case summary:

A 26-year-old man is known to the Nephrology service with a background of end-stage kidney disease secondary to tuberous sclerosis (TS). He has a number of medical problems stemming from TS, including cystic kidney disease, epilepsy, and multiple angiomyolipomata (AML). He underwent kidney transplantation in 2013 and in 2022, a left-sided native nephrectomy for uncontrolled bleeding from the AML. Histology of the left nephrectomy specimen showed an epithelioid angiomyolipoma, which was completely excised. In October 2023 he presented with symptomatic anaemia, requiring hospital admission and blood transfusion. A chest x-ray showed pulmonary opacities; subsequent cross-sectional imaging revealed appearances concerning for malignancy, including widespread multifocal masses in the lungs, mediastinum, liver, and retroperitoneum. A core biopsy of the retroperitoneum confirmed metastasis of the known epithelioid AML.

Biopsy findings:

The 2022 specimen (figure 1) measured up to 30cm; the renal parenchyma was replaced by a multinodular, partly cystic tumour. The cut surface included yellow areas, necrotic and haemorrhagic areas, and fatty nodules. The histology noted a tumour of variable appearances again (figures 2 & 3); the predominant component was made up of sheets of highly pleomorphic epithelioid cells. The cells were large and round to polygonal in shape with very large eosinophilic nucleoli.   There were scattered mitotic figures, including atypical mitotic figures. There were also sheets of mature adipose tissue, variably sized blood vessels and smooth muscle. Immunohistochemistry showed the epithelioid cells expressed Melan-A and HMB45. SMA was positive in the areas of smooth muscle.   The Ki67 proliferation index was higher in the epithelioid areas and lower elsewhere.

The retroperitoneal core biopsy showed extensive necrosis and collections of atypical epithelioid cells with large nucleoli. The cells resembled those seen in the nephrectomy specimen and showed the same immunoprofile (positive for Melan-A and HMB45).

Discussion:

Up to 60% of all TS patients, and up to 85% of TS patients with renal lesions, have reported AML.[i] Presenting symptoms include flank pain, visible haematuria, and acute kidney injury. They are part of a family of tumours called neoplasms with perivascular epithelioid differentiation, and are made up of blood vessels, smooth muscle and adipose tissue. Histologically they can be classified into classic and

epithelioid, the latter group being far less common but with an increased potential for malignant transformation. [1], [ii] [iii] [iv] [v] [vi] Two studies have stratified EAML on a pathological or clinicopathological basis and suggested the criteria for malignancy.

The presence of ≥ 70% atypical epithelioid cells, ≥ 1 mitosis/mm^2 [≥ 2 mitoses/10 high power fields (HPF) of 0.2 mm^2], atypical mitotic figures, and necrosis has been correlated with prognosis in a series of 40 atypical AML characterised by an epithelioid component making up 5–90% of the tumour.[4] The nephrectomy specimen from our patient had features including a predominant epithelioid component, 3 mitotic figures/HPF, atypical mitotic figures and necrosis. These findings are associated with an aggressive clinical course. This unusual diagnosis of metastatic EAML is worth considering in TS patients, and early investigation with biopsy is important to early management.

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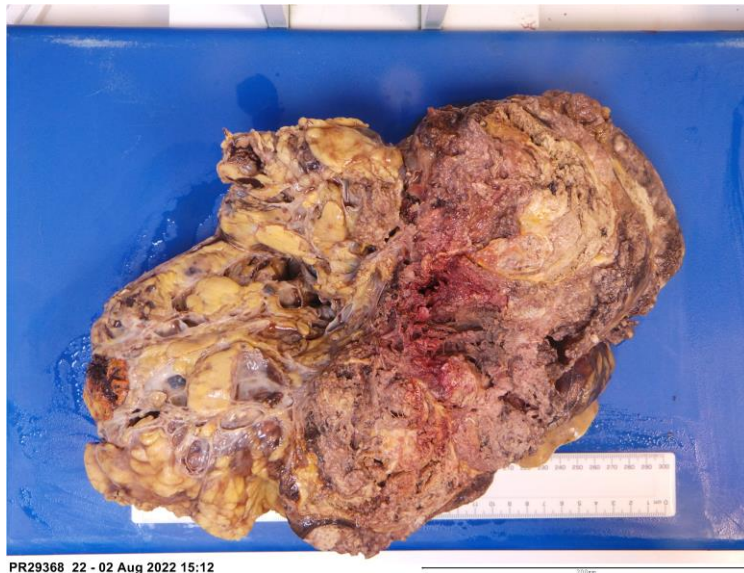
Figure 1 - Nephrectomy specimen macro- cut surface of the kidney showing necrotic and haemorrhagic tumour with yellow nodules and fatty areas
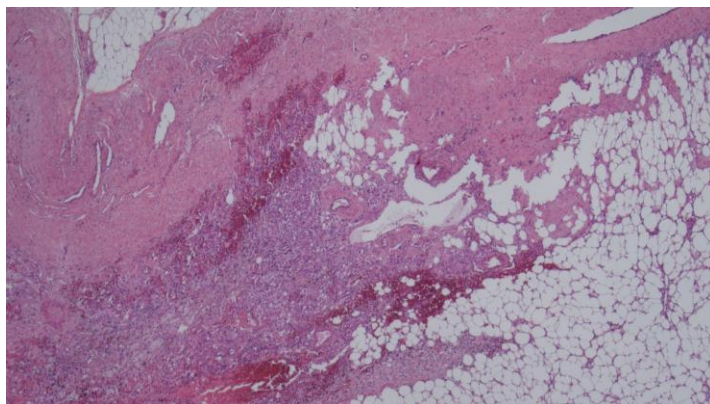
Figure 2 - Low power view of three tumour components. Smooth muscle (left), epithelioid cells (centre) and adipose tissue (right)
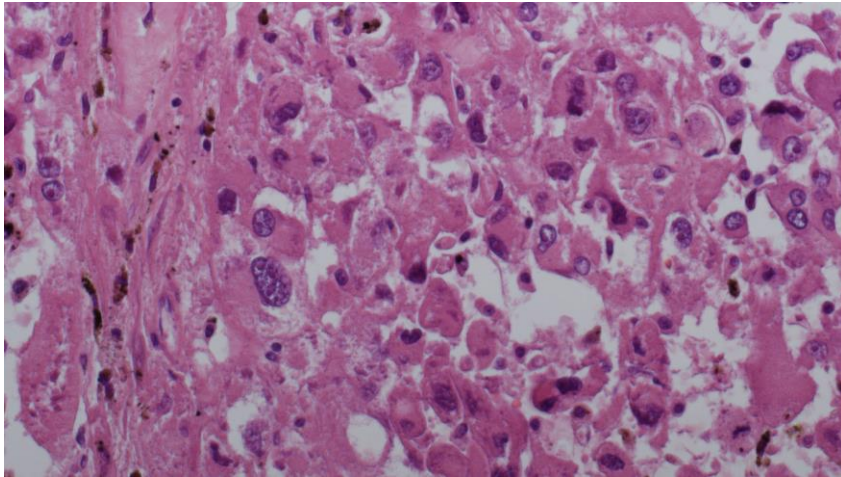
Figure 3 - High power view of epithelioid cells with large nuclei and prominent nucleoli. These cells were the predominant component of the nephrectomy specimen and core biopsy specimen

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Poster number: 412

Submission number: 142

A case report of sevelamer crystals associated recto-sigmoid ulcers: An unusual side effect

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Dr Umair Asad

Biography
Dr. Umair is a well-known and talented medical expert who has dedicated their career to medicine, specifically nephrology. Dr. Umair completed their medical degree in 2010 and then pursued a challenging three-year Post-Graduate Training program recognized by the College of Physicians & Surgeons in Pakistan, showing a commitment to continuous learning and skill development. He also participated in a prestigious two-year scholarship program between CPSP and the Royal College of Physicians Ireland/HSE Ireland, showcasing academic excellence and international collaboration in medical education. During this time, Dr. Umair obtained memberships from both the Royal College of Physicians UK and the Royal College of Physicians, symbolizing a significant achievement in their pursuit of excellence. Dr. Umair is currently enrolled in a specialized physician training program for nephrology. This program is approved by the General Medical Council and accredited by Health Education England, showing Dr. Umair's commitment to excellence in renal medicine. Dr. Umair contributions to nephrology go beyond clinical practice. He also actively participate in medical education, sharing their knowledge with aspiring professionals and advancing the field.

Abstract

Introduction

Sevelamer is a phosphate-binding agent used to treat hyperphosphatemia in patients with kidney disease [1]. It is generally well-tolerated with mild gastrointestinal side effects. Rarely, there can be gastrointestinal mucosal damage from sevelamer crystal accumulation. In a case we report, a 70-year old woman with end-stage renal disease had gastrointestinal bleeding and mucosal injury from sevelamer crystal deposition resulting in recto-sigmoid ulceration, which is rare.

Case

A 70-year-old woman with ESRD on haemodialysis admitted with feeling unwell during dialysis session. No abdominal pain or rectal bleeding on presentation. Abdominal examination showed a soft and non-tender abdomen. Initial tests showed stable blood count and metabolic panel. She complained of abdominal pain throughout her stay. After 10 days, she had an episode of fresh blood in her stools. Two days later, she had two more episodes of bleeding with loose stools. Rectal exam was normal. Sigmoidoscopy with biopsies was performed to establish a diagnosis, which revealed the presence of

ulcers in both the distal and proximal sigmoid colon, with extension into the rectum. Endoscopic biopsies of the rectal ulcerations revealed the surface bears crystalline material with pink and yellow hues and a "fish-scale" appearance characteristic of sevelamer crystals, as shown in Fig. 1. The etiology of colonic ulcers was hypothesized to be the resultant effect of the administration of sevelamer, which the patient had been consuming for a duration of four years and the medication was discontinued. The patient was treated with conservative measures and improved over time, with some abdominal discomfort but no more bloody stools. During her prolong hospital stay, clostridium difficile was found in her stool after a colonic biopsy. It's important to note that previous tests for clostridium difficile before the biopsy were negative, and it was thought that colonic ulcers may be due to sevelamer therapy.
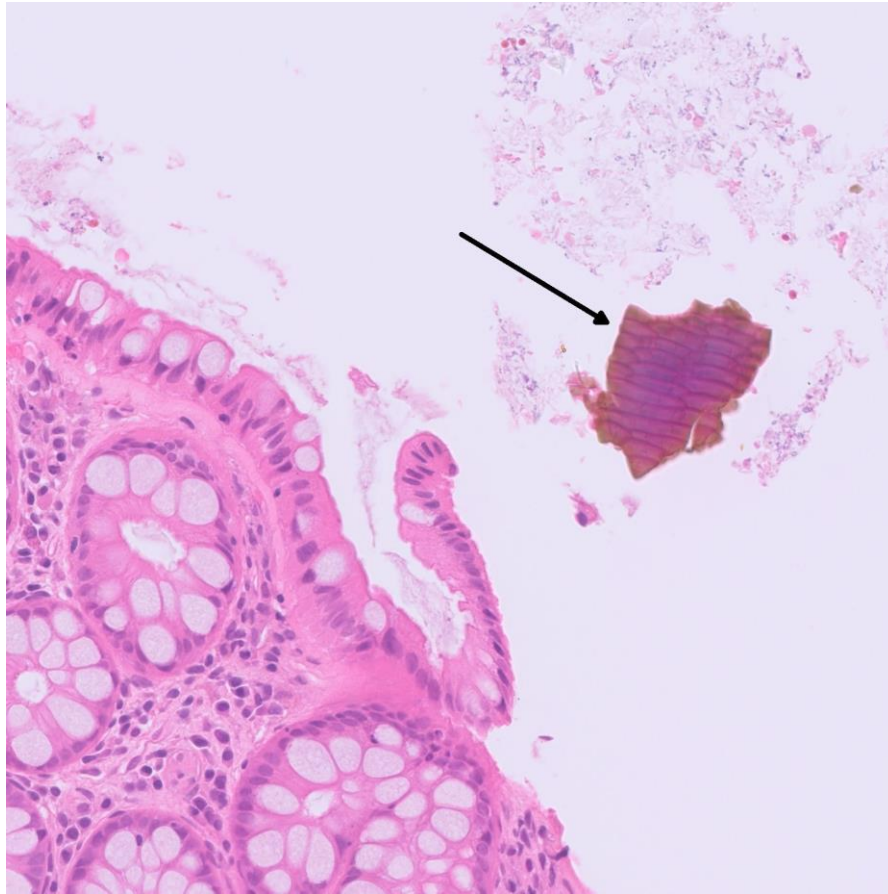
Fig 1. Characteristic histologic appearance of sevelamer pill fragments, featuring crystalloid structures with broad, slightly-curved, irregular "fish scales" (Black arrow) seen on mucosal biopsy.

Discussion

Mineral bone disease is a common feature in patients with chronic kidney disease, marked by abnormal levels of calcium, phosphate, and parathyroid hormone [2]. Sevelamer carbonate is a phosphate binder used to manage hyperphosphatemia in CKD patients, approved in 2000 [1]. Sevelamer crystals have unique non-polarizable properties and resemble wide, curved, and irregular fish scales. These crystals may contribute to colon inflammation and ulcer formation [4]. In 2008, Madan et al. reported a case of lower gastrointestinal bleeding caused by a stercoral ulcer [5]. However, no crystal deposition was found

on histopathology. Swanson et al. conducted a study and identified sevelamer crystals in 15 GI tract pathology specimens, with 14 of them showing abnormal mucosal findings [4]. The mechanism of intestinal injury by sevelamer and other ion-exchange resins is unknown. One theory proposes that these resins crystals cause cell death in intestinal epithelial cells, leading to neutrophil necrosis and extracellular trap release. This disrupts intestinal barrier function and promotes further necrosis. A study by Kim et al. discovered "fish scale"-like crystals in a patient with colon perforation after sevelamer dose escalation, suggesting a potential role in tissue damage [3].

Conclusion The use of sevelamer in patients with end-stage renal disease should consider the possibility of gastrointestinal lesions, especially lower GI bleeding. Unfortunately, there is no literature available on strategies to prevent sevelamer-induced mucosal injury. Nephrologists, gastroenterologists, and pathologists must be knowledgeable about the morphological features of the drug to accurately diagnose and prevent severe complications associated with mucosal injury.

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"Bevacizumab-Induced Focal Segmental Glomerulosclerosis Presented with Nephrotic Syndrome : A Case Report".

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Biography
Dr Panagoula Gkargkoula graduated from Medical School of Athens , part of the National Kapodistrian University Hospitals of Athens, in Greece in 2016 with a grade of excellence (MBBS). She gained an excellence award upon graduation for being in the highest 10% of her class. She was fully registered with GMC and a licence to practice in 2017, when she moved to the UK and enrolled in a medical and specialty training program at University Hospitals of Leicester. She got her MRCP diploma in 2021 and entered higher specialty training in nephrology in 2022. She is currently a specialty registrar in a training program in renal medicine in Brighton, University hospitals of Sussex. She has contributed and participated in organizing teaching programs for medical students in association with the undergraduate coordinator of medicine and the consultants in lead of undergraduate teaching in University Hospitals of Leicester. She has also participated in oral presentations in international conferences in renal medicine and at a national level as well. Furthermore, she has shown activity and interest in research on the renal field. She is also a member of European Renal Association and UK kidney association and Royal college of Physicians.

Abstract

Introduction:

Bevacizumab (Avastin$^{©}$) is a human monoclonal antibody against vascular endothelial growth factor A (anti-VEGF A). It is used in the treatment of many different types of cancer but also for other off-label indications such as macular degeneration and diabetic retinopathy. Both mild and nephrotic range proteinuria have been reported as a potential side effect of Bevacizumab in multiple studies and case reports. Thrombotic microangiopathy was the most common histopathologic type of glomerulopathy in renal biopsy. We report a case of nephrotic syndrome
that happened during treatment with bevacizumab for metastatic cervical cancer and was associated with Focal segmental glomerulosclerosis on the kidney biopsy.

Case report:

A 45-year-old lady with a background of hypertension and previous opioid and alcohol abuse right-sided chronic hydronephrosis due to ureteric surgical injury, previous infective endocarditis, two ischemic Cerebrovascular events, and epileptic seizures on antiepileptic treatment.

In 2007, she was diagnosed with squamous cell cervical cancer in South Africa. This was treated with radical hysterectomy and lymph node excision and achieved complete remission. However, in 2022, she had a relapse with abdominal recurrence and metastatic disease (liver and colon metastases), graded as stage IV. She was subsequently started on chemotherapy in January 2023 with carboplatin-paclitaxel and dexamethasone for a period of 6 months, along with bevacizumab. In June 2023, she completed the chemotherapy and continued bevacizumab only. She had a normal baseline kidney function with a creatinine of 70 mmol/l and eGFR > 60 ml/min.

A repeat CT scan in May 2023 showed improvement but no complete remission of her disease. In June 2023, she developed peripheral oedema and was found to have proteinuria with associated microscopic haematuria. Urine PCR was 240 mg/mmol, with serum albumin preserved at 35 g/l. However, her proteinuria increased significantly, reaching 800 mg/mmol in September 2023, with albumin dropping to 27 g/l, and her oedema worsened. Toxicology, myeloma, and autoimmune screens were all normal. Her inflammatory markers, including CRP and WCC, and renal function remained normal throughout this episode.

A kidney biopsy of the left kidney in October showed patchy findings of acute interstitial nephritis along with focal segmental glomerulosclerosis (FSGS) with non-specific immunofluorescence trapping of C3 and IgM. Thickening and fraying of the basement membrane described that raised the possibility of an immune-mediated process.

Bevacizumab was stopped in September due to the patient's nephropathy, and the patient's proteinuria started improving gradually thereafter, without any additional measures or treatment interventions apart from being on a small dose of furosemide 20 mg twice a day. In October, urine PCR was 700, then 300 mg/mmol in November and continued to improve down to 240 mg/mmol and 180 mg/mmol in December and January 2024, respectively. Microscopic haematuria disappeared.

Conclusion:

The strong correlation between the timing of withdrawal and the remission of the nephrotic disease, along with the lack of evidence of other causes, strongly supports that nephrotic syndrome with FSGS findings was induced by bevacizumab. Despite thrombotic microangiopathy being the most common histopathologic pattern observed in biopsies of bevacizumab-induced glomerulopathy, our patient had FSGS. Regular monitoring of urine protein and renal function is recommended in patients treated with this drug. Withdrawal of bevacizumab can improve the nephrotic syndrome. This adds another important differential diagnosis of glomerular disease in cancer patients.

Donor-derived Membranous Glomerulonephritis

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Biography
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Abstract

Introduction

Membranous glomerulonephritis is the most common cause of nephrotic syndrome in adults. We report two cases who were both transplanted with kidneys from a donor with nephrotic range proteinuria under evaluation unknown to the transplant team.

Case presentation

Donor

The donor was a 66-year-old female with chronic obstructive pulmonary disease, donor after cardiac death, with the cause of death being hypoxic brain injury. Her with a creatinine of 59 umol/litre. She had been referred to a nephrology unit with nephrotic syndrome (albumin-creatinine-ratio 800 mg/mmol, urine dip 3 + protein with no chemical haematuria) and was awaiting a kidney biopsy. PLA2R antibody titre was not done, and she had not been screened for secondary causes as these were not thought to be clinically relevant. The implantation biopsies of both the kidneys showed of membranous nephropathy evidenced by granular depositions of IgG and C3 on capillary walls and beaded deposition of IgG4.

Recipients

Recipient A is a 59-year-old male with a past medical history of end-stage kidney disease (ESKD) of unknown aetiology, hypertension, and obesity who had been established on haemodialysis, for one and a half years before transplantation. He underwent a protocol kidney biopsy at 94 days after his transplant.

Recipient B is a 72-year-old male with a past medical history of ESKD secondary to presumed diabetic nephropathy, type 2 diabetes mellitus, peptic ulcer disease, hypertension, obesity, and atrial fibrillation. He had been on peritoneal dialysis for one year at the time of transplant, and his pre-transplant protein-

creatinine ratio was 1120 mg/mmol, likely secondary to diabetic nephropathy. He had episodes of recurrent graft pyelonephritis and had a biopsy on day 11 post-transplant due to graft dysfunction.

Both the recipients had a mismatch of 212 and had no preformed donor-specific antibodies. They received standard immunosuppression, induction with Basiliximab, and maintenance immunosuppression with tacrolimus, mycophenolate, and prednisolone. both the recipients had to come off mycophenolate for different reasons. They have been followed up for three years, their graft function remains stable, and in one patient, subsequent biopsy has shown the lessening of the intensity of IgG4 deposition.
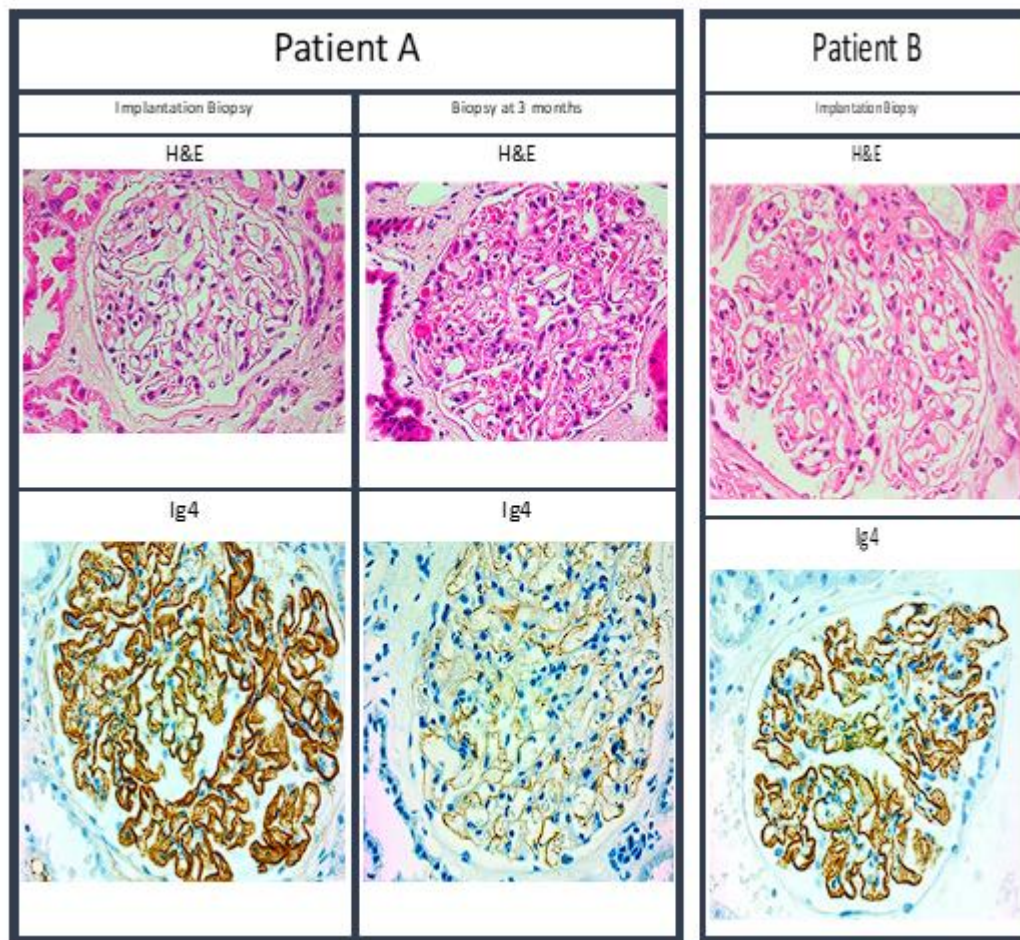
Discussion/Conclusions

There are very few reported cases of kidney donors with membranous GN with most of such reports being about a single recipient. All the case reports have reported favourable graft outcomes for the recipients, demonstrating a progressive yet incomplete reduction in immune complex deposition and capillary wall remodelling in the transplanted kidney. In the biopsies of one of our patients, we have seen marked improvement in IgG4 deposition within three months after transplantation.

In our experience, the proteinuria improves significantly within one month of transplantation and stays mostly consistent thereafter. Both our patients had biopsies early in the post-transplant period, and the immunohistochemistry showed persistent but much improved IgG4 deposits. Subsequent kidney biopsies were not done in the absence of clinical indication. Cessation of mycophenolate does not seem to have affected their proteinuria or graft function adversely. Given these findings, we think that donor-derived membranous GN goes into remission clinically, despite persistent albeit attenuated histological changes, within weeks of transplantation in the presence of immunosuppression.

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Poster number: 415

Submission number: 426

Heterotopic bone formation in failed transplant kidney

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Abstract

Introduction

Heterotopic bone formation in the kidneys is seldom reported in cases of renal neoplasms. However, instances of mature bone formation in renal allografts are exceptionally rare. Here, we present a case involving bone formation in a failed renal allograft.

Case report

A 29-year-old male developed chronic kidney injury at age 15 secondary to meningococcal septicaemia, which progressed to stage V kidney disease by the age of 19, at which point, he started haemodialysis. He underwent renal transplantation with a deceased donor kidney from a 21-year-old male donor (MM 211). On the background of low level donor specific antibodies, he maintained stable graft function for six years at which point he developed acute graft dysfunction aged 28 due to Banff 2b rejection with a predominant humoral component. A period of non-adherence to his immunosuppressive therapy was suspected due to frequent non-attendance in our renal transplant clinic. He did not respond to pulses of methylprednisolone or plasma exchange and transitioned to regular haemodialysis. ATG was not given because of widespread scarring.

As expected, his serum calcium remained normal but at the expense of a rising parathyroid hormone and serum phosphate after the commencement of haemodialysis. His immunosuppression was gradually tapered off as per our departmental protocol.

He subsequently developed several episodes of pain over his graft following cessation of immunosuppression due to suspected rejection. His ultrasound and CT scan of the kidney, as part of his graft tenderness, showed multiple punctate foci of calcification in the graft consistent with multiple renal calculi. He underwent a graft nephrectomy which on renal histology showed widespread glomerulosclerosis, C4d positivity, and focal calcification within tubules and blood vessels. However, an

incidental finding of osseous metaplasia phenotypically appearing as normal bone was observed in the interstitium of one focal area (Fig 1).
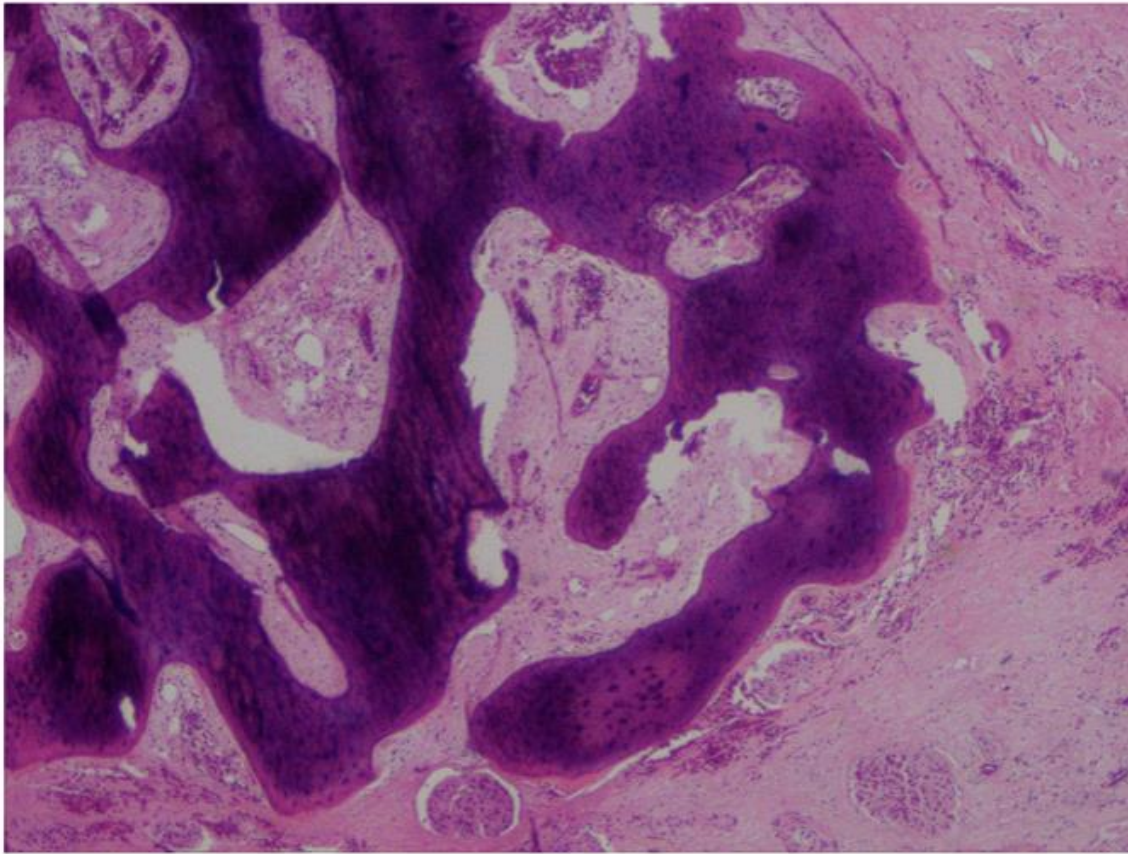
Discussion

Six cases of ectopic bone formation in renal allograft have been reported previously (Campobasso et al., 2014, Sanders et al., 2014, Bataille et al., 2010, Azhir et al., 2007, Tousignant et al., 2006, Chan et al., 1999). It has been shown in animal models that bone formation may follow ischaemic and inflammatory insults in the kidney, and the connective tissue cells, e.g. vascular smooth muscle cells have the potential to transdifferentiate into osteoblasts when exposed to high phosphate levels. In our case, widespread scarring and ischemic changes were observed, like previously reported cases. These changes were attributed to rejection, accompanied by an increase in phosphate levels, creating a conducive environment for bone formation.

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Poster number: 416

Submission number: 324

Unusual Presentation of ANCA Vasculitis

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Biography
Dr Vasishta is an IMT 1 in South West Wales, keen to pursue specialty training in renal medicine. She did her MBBS from Rajiv Gandhi University Health Sciences, India. As a medical student she has presented in various national and international conferences and was awarded the fiercely competitive travel grant by Indian Council of Medical Research (ICMR) for presentation at the European Conference of Clinical Neuroimaging. She won two competitive national level short term studentships (STS) by ICMR and was awarded Ministry of Human Resource and Development (MHRD) scholarships for 5 consecutive years. Additionally, she did her research elective in Johns Hopkins University- School of Medicine under Prof Dale Needham wherein she coordinated clinical trials, worked on systematic reviews, some of which are published.

Abstract

Anti-neutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV) represents a group of small vessel vasculitides characterised by granulomatous and neutrophilic tissue inflammation, often associated with the production of antibodies that target neutrophil antigens. (1)

We report here the case of a 62-year-old male veteran and a non-smoker who presented to his general practitioner (GP) with 6 weeks of dyspnoea on exertion, cough and haemoptysis. Initial chest radiograph demonstrated a large left upper zone cavitating lesion with contralateral hilar mass suspicious for underlying malignancy. Subsequent CT Thorax, Abdomen and Pelvis with contrast revealed large partially cavitated malignant-looking mass that infiltrated most of the left upper lung lobe (reported 'quite hard to measure'), and multiple secondary deposits in both lungs. Left upper lobe bronchial biopsy and vasculitis screen were sent in the following weeks.

One month later, he was referred to local district general hospital from GP due to severe acute kidney injury (AKI) (significant rise in creatinine at 826 µmol/l, from baseline of 67 µmol/l measured 20 days earlier) and hyperkalaemia, requiring admission to Intensive Care Unit. Detailed history from the patient at that time revealed additional systemic symptoms including vasculitic rash (livedo reticularis) and migratory polyarthralgia. By this time, his vasculitis screen (requested earlier), was reported as c-ANCA positive at titre of 1:160 and positive for anti-proteinase 3 (PR3) antibodies. He was suspected with rapidly progressive glomerulonephritis (RPGN) secondary to AAV and empirically treated with high dose steroids, and subsequently transferred to the regional renal centre.

The lung biopsy was then reported as inflamed granulation tissue without any evidence of neoplasia, thereby leading to the diagnosis of PR3- ANCA Associated Vasculitis with pulmonary and renal involvement. He underwent treatment with cyclophosphamide with which his renal function is slowly improving (creatinine of 432 μmol/l at the time of abstract submission), along with remarkable improvement in the lung mass on repeat imaging.

In this case, the large nature of the granuloma was misdiagnosed to be locally advanced lung cancer, highlighting the importance of histopathological diagnosis. We demonstrate that variable and unusual presentation of AAV can lead to misdiagnosis and subsequent delay in treatment. It important for physicians to have high index of suspicion for AAV in cases of multisystem clinical manifestation to ensure timely intervention.

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Podocytopathy preceding Anti-glomerular basement membrane disease

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Dr Muhammad Bilal Fakhar

Biography
I am Renal ST7 currently based in Norfolk & Norwich University hospital. I would be the lead & presenting author of this case should it be selected for clinicopathologic session. I am looking forward to present this fascinating case at UKKW 2024.

Abstract

A 66-year-old man was referred by his general practitioner with a few weeks' history of bilateral pedal oedema. His background medical history included bullous pemphigoid, type 2 diabetes mellitus, hypertension, cerebrovascular disease and ulcerative colitis (in remission). Pre-admission medications included Alogliptin, Omeprazole, Ramipril, and Rosuvastatin. Physical examination revealed bilateral pedal oedema and blood pressure 148/84 mmHg. Laboratory investigations showed: serum creatinine 158 µmol/L, albumin 9 g/L, and urine protein to creatinine ratio 1637 mg/mmol. Anti-nuclear antibodies, anti-phospholipase-2 receptor antibodies, complement C3 and C4 levels, and serum free light chain ratio results were all normal, and Hepatitis B, Hepatitis C, and HIV studies were negative. These findings were consistent with nephrotic syndrome and a renal biopsy was therefore performed. Light microscopy was normal, stains for immunoglobulins and complement were negative, and electron microscopy showed diffuse foot process effacement with areas of microvillous transformation compatible with minimal change disease or unsampled focal segmental glomerulosclerosis. He was commenced on oral Prednisolone 60mg. There was complete remission by week 12 and the steroids were weaned off over the next five months.

He re-presented one month later with an acute febrile illness. Clinical examination was unremarkable, but urine dipstick showed 3+blood and 2+protein. He was oliguric and blood tests showed acute kidney injury with a serum creatinine of 185 µmol/L. Urine culture was negative and chest radiograph was unremarkable. He was commenced on intravenous antibiotics and fluids for a presumptive diagnosis of sepsis of unknown origin. Despite this treatment his renal function continued to worsen, with a creatinine of 673 µmol/L by day 5. He therefore underwent a renal biopsy and serological assays were sent. Unexpectedly, this showed a florid necrotising glomerulonephritis with an accompanying tubulointerstitial nephritis. All the glomeruli were abnormal showing acute global necrosis in the majority of glomeruli with rupture of Bowman's capsule and a florid granulomatous reaction. No extraglomerular vasculitis was seen. Immunohistochemistry showed linear IgG staining of the capillary walls. The histological appearances were of anti-glomerular basement membrane glomerulonephritis,

supported by strongly positive plasma anti-glomerular basement membrane antibodies at 639 U/mL, but with negative anti-neutrophil cytoplasmic antibodies. There was no clinical evidence of pulmonary haemorrhage. Although the likelihood of renal recovery was felt to be poor, he was treated with plasma exchange and pulsed intravenous methylprednisolone. However, there was no improvement in his renal function, and immunosuppression was therefore discontinued. He remained dialysis-dependent.

Discussion

This patient presented with nephrotic syndrome, and a podocytopathy on renal biopsy, that responded to steroids. He then developed rapidly progressive glomerulonephritis, with findings consistent with anti-glomerular basement membrane disease. This association is not well described in the literature, and it is unclear whether there was any causal relationship in this patient. However, previous studies have proposed that dysregulation of podocytes may lead to alteration of their phenotype, including expression of new epitopes. In addition, data from experimental models have suggested that podocytes may play a role in crescent formation in anti-glomerular basement membrane disease. It is therefore possible that there was a causal relationship between his two presentations.

Poster number: 418

Submission number: 574

Diagnosing nephrotic syndrome due to AL amyloidosis - a matter of sensitivity

Dr. José Mário Bastos, Dr. Joana Medeiros, Dr. Johanna Viana, Dr. Catarina Silva, Dr. Renata Carvalha, Dr. Barbara Ribeiro

Hospital de Braga, Portugal

Dr. José Mário Bastos

Biography
Nephrology resident (final year) in Hospital de Braga, Portugal

Abstract

Background: Amyloidosis is part of the differential diagnoses for adult nephrotic syndrome. Serum protein electrophoresis is a common test with a sensitivity of 87.6% for detecting monoclonal gammopathy in the presence of multiple myeloma and 73.8% in AL amyloidosis. Immunofixation is a more sensitive method that allows characterization of the type of monoclonal protein. Serum free light chain assay, particularly the κ/λ ratio, is an even more sensitive way to infer monoclonality. Combining electrophoresis with free light chain assessment achieves nearly 100% sensitivity in detecting multiple myeloma. We describe a case of multiple myeloma and AL amyloidosis where monoclonal protein identification was intangible through the mentioned methods, and the diagnosis was only possible through bone marrow and renal biopsies.

Clinical Case: A 73-year-old man with no relevant medical history or regular medication presented to the emergency department in September 2023 with progressive and worsening peripheral edema for about a month. After clinical and laboratory evaluations he was admitted to the nephrology department for nephrotic syndrome with proteinuria of 9g/g and hypoalbuminemia of 2.2 g/dL, coupled with renal dysfunction with an admission creatinine of 2.7 mg/dL. Etiological studies (including anti-neutrophil cytoplasmic antibodies and antinuclear antibodies) and viral serologies were negative. Serum protein electrophoresis showed no peaks, and the serum free light chain ratio [ProSpec® (Siemens)] was within the normal range. Renal biopsy identified glomerulopathy with amyloid deposition. Immunofluorescence was negative for the tested antibodies, and immunohistochemical study revealed restriction to the κ light chain. Subsequent bone marrow biopsy detected 28% medullary plasma cells, with 1.8% abnormal plasma cells in immunophenotyping, 80% of which were abnormal. Chemotherapy with cyclophosphamide, bortezomib, and dexamethasone was initiated in November 2023.

Conclusion: We present a case of AL amyloidosis with κ light chain associated with multiple myeloma, where there was considerable difficulty in identifying the monoclonal component using commonly employed sensitive methods. This case underscores the importance of employing alternative diagnostic methods, particularly renal biopsy, in the diagnostic approach to nephrotic syndrome.

IgA vasculitis: an unexpected diagnosis of pulmonary renal syndrome

Dr. José Mário Bastos, Dr. Joana Medeiros, Dr. Sofia Marques

hospital de braga, Portugal

Dr. José Mário Bastos

Biography
Nephrology residente in Hospital de Braga

Abstract

INTRODUCTION: IgA vasculitis is an inflammatory condition affecting blood vessels that poses a significant diagnostic and therapeutic challenge in clinical practice. Characterized by the deposition of immunoglobulin A (IgA) on vessel walls, this pathology can manifest in various ways, presenting a broad and sometimes complex clinical spectrum. Ninety percent of cases occur in the pediatric age group. Severe lung involvement, such as pulmonary hemorrhage, is rare in patients with IgAV. We present a case of a 33-year-old patient with pulmonary renal syndrome and without purpura, an atypical presentation of IgA vasculitis.

CLINICAL CASE: We describe the case of a 33-year-old patient with no relevant medical history or regular medication, who presented to the emergency department in November 2022 with symptoms of hemoptysis, fatigue, myalgias, and pallor. On physical examination, the patient was conscious, cooperative, normotensive, tachycardic, afebrile, with bilateral axillary adenopathies, and scattered crackles on lung auscultation. Laboratory tests revealed anemia with a hemoglobin level of 5.8 g/dL, non-oliguric acute kidney injury with a creatinine level of 2.25 mg/dL, microscopic hematuria (>50/hpf), and proteinuria (UPCR of 2.8 mg/mg and UACR of 1.6 mg/mg). A chest CT scan showed bilateral and scattered ground-glass opacities consistent with alveolar hemorrhage. The patient was admitted to the Nephrology service, underwent 3 sessions of plasma exchange, and started therapy with methylprednisolone 1000 mg for 3 days. A renal biopsy revealed 24 glomeruli, with 3 showing segmental sclerosis and 1 with fibrocellular crescents, mild interstitial nephritis; immunofluorescence showed IgA+++, C3++, IgM, and IgG+- Oxford Classification: M1 E0 S1 T0 C1. Bronchofibroscopy showed a rosy bronchoalveolar lavage and macrophages with hemosiderin pigment deposition. The patient continued with prednisolone at 1 mg/kg. In January 2023 (after two months), there was a >25% reduction in albuminuria with resolution of acute kidney injury. A gradual reduction of prednisolone was initiated, and it was definitively discontinued in October 2023. In the last outpatient visit in January 2024, the patient maintained normal renal function, with no hematuria, UPCR of 100 mg/g, UACR of 70 mg/g, and no further episodes of alveolar hemorrhage.

CONCLUSION:: This case stands out for its atypical presentation: an adult with alveolar hemorrhage and without other more classical manifestations of IgA vasculitis, such as purpura. This is yet another case that emphasizes the importance of the broad spectrum of diagnoses that a nephrologist should consider in the face of acute kidney injury.

Poster number: 420

Submission number: 604

Recurrent Endogenous Endophthalmitis - A complication of tunnelled haemodialysis catheter related bacteraemia

<u>Dr Tasneem Elghazali Bakhiet</u>, Dr Rafia Waheed, Dr Adonis ElSalloukh

University Hospital Of Wales, Cardiff

Dr Tasneem Elghazali Bakhiet

Biography
I am an academic foundation doctor passionate about Ophthalmology and aiming to pursue a career in this field. I have great interest in research and have presented audits, case reports and studies at multiple conferences and I have published a paper. I was fortunate enough to spend a rotation in Nephrology where I grew profound admiration for the beauty of haemodialysis and the art of navigating its use and managing its complications. I aim to work in close proximity to this speciality in my future and bridge the gap between Renal and Ophthalmic care.

Abstract

<u>Introduction</u>

Endogenous endophthalmitis is an infrequent yet severe intraocular inflammatory condition that arises from the haematogenous dissemination of microorganisms from a distant infectious focus to the eye. This condition is characterized by a reported incidence of 2-8%.[1] The rarity of endogenous endophthalmitis can be ascribed to the ocular immune privilege, wherein protective mechanisms have evolved within the eye to restrain inflammation. However, when systemic infections breach these defences, the consequences can be profound, often resulting in rapid and severe visual impairment.[2]

<u>Case</u>

We present the case of a 62-year-old female, with a background of end-stage renal disease secondary to type 2 diabetes mellitus, presenting with acute confusion, pyrexia and general malaise. She was undergoing maintenance haemodialysis through a left internal jugular tunnelled dialysis catheter following her left arteriovenous fistula being ligated due to Steal syndrome. Blood cultures from the central line grew Staphylococcus aureus. Intravenous vancomycin and flucloxacillin were initiated and the tunnelled catheter was removed.

A few days later, she complained of redness and severe pain in her left eye, accompanied by diminished vision and photophobia. The patient had a prior history of diabetic retinopathy and macular oedema in the same eye. Ophthalmology review revealed evidence of left-sided hypopyon. A diagnosis of metastatic bacterial endophthalmitis secondary to Staph Aureus bacteraemia related to the tunnelled dialysis catheter was established. Treatment included topical ofloxacin and steroids, resulting in

improved visual symptoms. She was discharged with regular ophthalmology follow-up. As she lacked an arteriovenous fistula, another tunnelled dialysis catheter was inserted.

After four months, she presented with a second episode of Staph Aureus bacteraemia related to her tunnelled dialysis catheter. Once again, she reported visual impairment and profuse pain in her left eye. Ophthalmology review revealed conjunctival hyperaemia, corneal flare, and grade IV anterior chamber cells. A diagnosis of recurrent endogenous endophthalmitis was made, and she received intravenous antibiotics and topical steroids, leading to symptom improvement.

Discussion

Endogenous bacterial endophthalmitis is a rare complication of dialysis catheter-related bacteraemia, with only eight cases reported to date[3]. Notably, there has been no reported case of a patient experiencing recurrent endophthalmitis. Diabetic retinopathy is considered a confounding factor for endogenous endophthalmitis, as observed in our patient. Urgent ophthalmologic evaluation and treatment are crucial when suspected to reduce the risk of vision loss in the affected eye. Early referral of patients for arteriovenous fistula formation for haemodialysis access can potentially prevent this condition.

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Poster number: 421

Submission number: 201

Bacteraemias in patients on renal replacement therapy – 4 year single centre experience

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Renal Unit, St. Helier Hospital, Surrey UK

Dr Christy Rajeevkumar Ratnakumar

Biography
I currently work as specialty registrar in Nephrology at St Helier hospital. I have graduated MBBS in Sri Lanka at University of Sri Jayewardenepura (2008-2014) with First class Honors. My postgraduate qualifications are MD Medicine from postgraduate Institute of Medicine, University of Colombo, Sri Lanka and MRCP UK. I am a trainee in Nephrology in Sri Lanka, who has successfully completed the postgraduate MD program in Medicine and currently undergoing my overseas post MD specialty training in Nephrology. My vision is to improve the quality of care provided to patients with kidney diseases and to contribute to the development of the field of Nephrology internationally. I had broad exposure to inward care, intermediate care and outpatient care of patients with kidney diseases. I have had good experience in renal transplantation and interventional nephrology as well. I have wide range of interests in nephrology, especially glomerular diseases, renal transplant medicine and intervention nephrology. During my training in UK I have developed special interest in research, quality improvement projects and teaching. I look forward to gain more experience in United Kingdom.

Abstract

Introduction

Infection is a common cause of morbidity and mortality in patients on renal replacement therapy (RRT). The majority of bacteraemias in haemodialysis(HD) patients are related to the vascular access. We decided to look at our dialysis cohort to see whether there was a difference in the incidence and types of bacteraemias based on the type of HD access and what the annual trends were over the last 4 years.

Methods

We retrospectively reviewed patients on different modalities of RRT who had bacteraemias between May 2019 and December 2023. Data collected using an electronic database included the type of RRT, blood culture results and type of dialysis access. Statistical analysis was done with Microsoft Excel.

Results

There were 481 bacteraemias, of which 411 (85%)were from patients undergoing HD.There was a 12% increase in the HD population from 872 to 982 between 2019 and 2023. The proportion of bacteraemias fell over this period from 0.36 to 0.23 bacteraemias per 1,000 patient days (figure 1).

Micro-organisms isolated from HD patients were Gram positive 325 (78%), and Gram negative 85(22%). Of the Gram positive organisms, 28(8.6%) were Enterococci, 264 (81%) were staphylococci [MSSA - 102(38%) MRSA - 8 (3%) coagulase negative - 154 (49%)].There was no significant difference in the annual prevalence of these organisms.

Dialysis access related bacteraemias(figure 2) were as follows: AV fistula/graft 58(14%), Tunnelled dialysis lines 317(77 %), non-tunnelled dialysis lines 35 (9%).

Conclusion

In this cohort of patients, bacteremias were more common in HD patients. The predominant organisms isolated were Gram positive and the majority of these were coagulase negative staphylococci. The incidence of MRSA was one tenth that of MSSA.

Bacteraemias were much more likely to occur in patients dialysing through lines as compared with AV fistulae or grafts. This lends weight to the drive to increase the proportion of patients dialysing through AVFs or AVGs.

Figure 1

Mean annual HD population

Bacteraemias per 1,000 patient days

Figure 2

Proportion of bacteraemias according to modality of kidney disease

Proportion of infections in relation to HD access 2019 - 2023
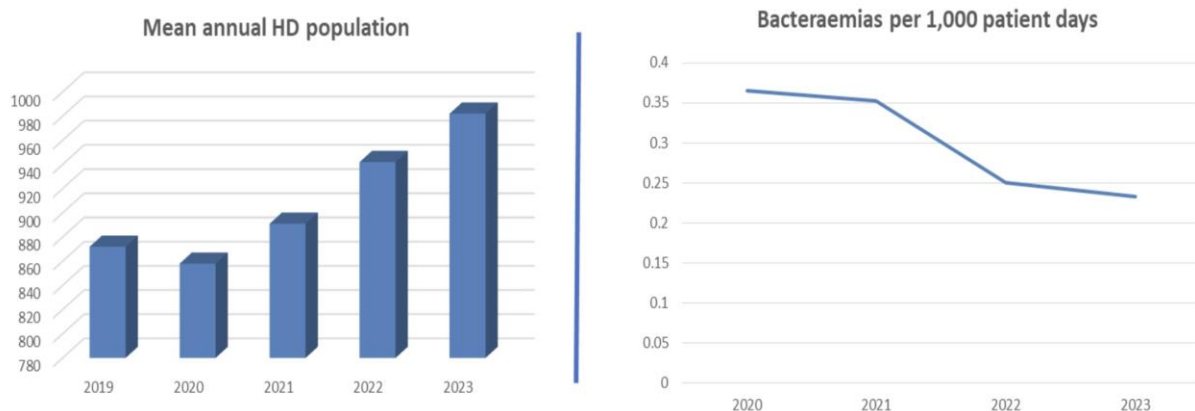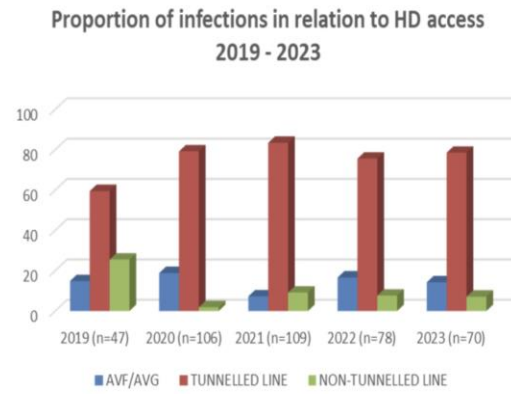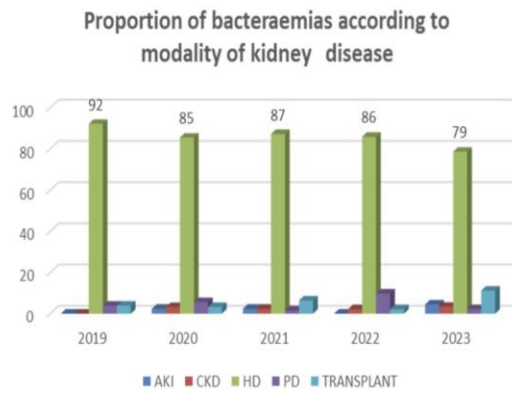
Validation of a prognostic model for adverse events in advanced chronic kidneydisease in the chinese population

Dr Yao Xingchen[1,2], Dr Yang Chao[1,2,3], Dr Wang Jinwei[1,2], Dr Li Chenglong[4,5], Dr Zhang Luxia[6,2,3,4,7]

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Dr Yao Xingchen

Biography
I am currently pursuing a Doctoral degree in the Department of Medicine at Peking University, under the supervision of Professor Zhang Luxia. My primary research focus lies in the prevention and control management of chronic kidney disease.

Abstract

Introduction: Currently, the Grams model has been developed to estimate risks of adverse events among advanced chronic kidney disease (CKD) patients in western populations. Its utility is noteworthy as it predicts multiple adverse events within a single model while taking competing risks into account. While no external validation has been conducted among Asian, especially Chinese population, restricting further practical application and clinical benefits evaluation. Hence, we aimed to validate the performance of Grams model for estimating risks of major adverse events among Chinese CKD population.

Methods: The Grams model was validated in the Chinese Cohort Study of Chronic Kidney Disease (C-STRIDE) study, a multicenter prospective cohort study which involved 39 renal departments of 39 hospitals from 28 cities of 22 provinces in China. Participants with estimated glomerular filtration rate (eGFR)<30ml/min/1.73m^2 during baseline and follow-up were enrolled. The same predictors as those selected in the Gram model were considered, including age, sex, race, history of cardiovascular disease(CVD), smoking status, systolic blood pressure, diabetes mellitus, eGFR, and urine albumin-to-creatinine ratio (uACR). The outcomes included kidney replacement therapy(KRT), CVD and death within 2- and 4- year follow-up periods. The discrimination and calibration of the model were evaluated using the concordance index (C index), the ratio of observed and expected outcomes (O/E ratio), and the calibration curve. The clinical utility of the model was assessed through decision curve analysis. Intercept recalibration was used to update the model.

Results: Among 1333 included participants (54 (IQR, 43-64) years, 699(52.4%) male), 386(29.0%) developed KRT, 118(8.9%) developed CVD, 88(6.6%) died during the follow-up period. The Grams model showed a moderate to good discrimination for three outcomes, with the C index ranging from 0.656 to 0.720. According to the O/E ratios and calibration curves, the calibration for KRT was relatively accurate, but the model overestimated the predicted probability of CVD and death. Intercept recalibration led to closer alignment of observed and predicted risks. Decision curve analyses revealed the superior net benefit of the Grams model in guiding KRT preparation.

Conclusion: In summary, the Grams model exhibited moderate discrimination for predicting outcomes, with relatively accurate calibration for KRT but an overestimation of predicted probabilities for CVD and death, intercept recalibration improved the calibration of the model. Despite its limitations, the model offered a superior net benefit in guiding KRT preparation, suggesting its potential use in clinical decision-making process. Further investigations are warranted to improve the performance of the Grams model in Chinese population.

Table 1 discrimination of the Grams model before and after updating.

outcome	C index(95%CI) before updating		C index(95%CI) after updating	
	2-year model	4-year model	2-year model	4-year model
KRT	0.720 (0.688-0.752)	0.686 (0.659-0.714)	0.717 (0.686-0.747)	0.684 (0.658-0.712)
CVD	0.656 (0.593-0.721)	0.658 (0.601-0.710)	0.668 (0.605-0.731)	0.660 (0.605-0.714)
death	0.712 (0.600-0.816)	0.684 (0.616-0.753)	0.688 (0.565-0.814)	0.677 (0.608-0.750)

Abbreviations: C index, concordance index; CI, confidence interval; KRT, kidney replacement therapy;

CVD, cardiovascular disease.

A KRT before updating

O/E ratios:
2-year model:0.855(95%CI, 0.763-0.959)
4-year model:0.764(95%CI, 0.698-0.835)

2-year model
4-year model

Observed probability
Predicted probability

B CVD before updating

O/E ratios:
2-year model:0.662(95%CI, 0.531-0.824)
4-year model:0.575(95%CI, 0.479-0.691)

2-year model
4-year model

Observed probability
Predicted probability

C Death before updating

O/E ratios:
2-year model:0.184(95%CI, 0.120-0.281)
4-year model:0.281(95%CI, 0.219-0.359)

2-year model
4-year model

Observed probability
Predicted probability

D KRT after updating

O/E ratios:
2-year model:1.016(95%CI,0.906-1.140)
4-year model:0.862(95%CI, 0.789-0.943)

2-year model
4-year model

Observed probability
Predicted probability

E CVD after updating

O/E ratios:
2-year model:0.984(95%CI, 0.790-1.226)
4-year model:0.818(95%CI, 0.680-0.983)

2-year model
4-year model

Observed probability
Predicted probability

F Death after updating

O/E ratios:
2-year model:0.878(95%CI, 0.574-1.341)
4-year model:0.842(95%CI, 0.658-1.077)

2-year model
4-year model

Observed probability
Predicted probability

Poster number: 423

Submission number: 118

An audit of the use of Sodium-Glucose Co-Transporter 2 Inhibitors for patients with chronic kidney disease: Are we following the UKKA and NICE guidance?

Dr Liberty-Isabelle Todd, Dr Richard Powell

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Dr Liberty-Isabelle Todd

Biography
Currently working as an F2 doctor in the South-West and applying for internal medicine training.

Abstract

Introduction

In 2021, the UK Kidney Association (UKKA) and National Institute for Health and Care Excellence (NICE) released specific guidance on the use of Sodium-Glucose co-transporter-2 inhibitors (SGLT-2I) in the management of chronic kidney disease (CKD).[1]

This guidance specifies a need for national shift towards the use of SGLT-2 inhibitors in those with CKD with, or without, the presence of diabetes or albuminuria.[1]

To understand better our current standpoint on the use of SGLT-2I for CKD patients we carried out two cycles of an internal, retrospective quality improvement project (QIP) between January 2023 and October 2023, assessing for prescription of SLGT-2I in patients who met the specifications set within the UKKA guidance.

Method

The aim of this audit was to understand the number of suitable patients who are on an SGLT-2I already and to recognise where they could be further utilised.

Our audit included all patients who met the specified inclusion and exclusion criteria outlined within the UKKA guidance, who have been seen in outpatient renal clinic between January 2023-March 2023 for cycle 1, and August 2023 – October 2024 for cycle 2, who have a glomerular filtration rate of 25 - $60_{ml}/min/1.73_{M}^{2}$. Between our two cycles, we held an in-person teaching session to educate the medical team and CKD specialist nurses on the updated guidance and benefit of SGLT-2I therapy. We also made the guidance accessible via posters in both in outpatient and inpatient spaces, and via email.

Results

In cycle 1, 152 patients met our inclusion and exclusion criteria. Of the 90 cases who were deemed to be potentially eligible, 35% were already on SGLT-2I therapy (Figure. 1).

57 patients had a diagnosis of type 2 diabetes mellitus (T2DM) and were eligible for SGLT-2I treatment. 42 qualified based only upon their urinary albumin: creatinine ratio (uACR), of which 40% had SGLT-2I treatment. 15 cases were eligible due to their co-morbidities, but did not have proteinuria, of which only 20% had SGLT-2I treatment (Figure. 2).

We repeated our audit following our departmental teaching and the use of posters to raise awareness of the new guidance. In cycle 2, 220 patients who were reviewed in clinic met our criteria, of which 109 were eligible for therapy; 50% of these were prescribed an SGLT-2I, showing an improvement of 15% (Figure. 3).

Discussion

An increase of suitable SGLT-2I prescription by 15% demonstrated by our QIP following inter-departmental teaching and discussion around the latest UKKA guidance, suggests that awareness of this therapy as a novel and likely under-utilised preventive measure against CKD needs to be ongoing.

Our data also suggests that we are more proactive at initiating SGLT-2I for those with deranged uACR and concurrent diabetes, but less so in those with absent or minimal proteinuria and relevant co-morbidities, such as heart failure, ischaemic heart disease and peripheral vascular disease.

We now aim to expand trust-wide awareness of the new UKKA guidance, particularly for clinicians caring for patients with CKD and concurrent cardiovascular or peripheral vascular disease, such as general practice trainees, the heart failure specialist nurses and diabetic team.

Figures:

Figure 1. Summary of overview data from cycle 1
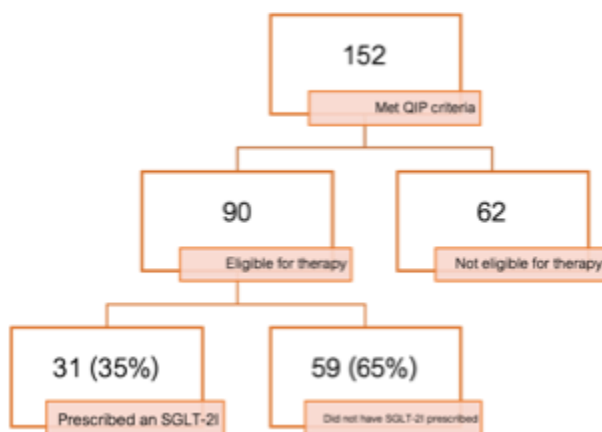
Figure 2. Summary of breakdown data for patients with T2DM from cycle 1

Figure 3. Summary of overview data from cycle 2
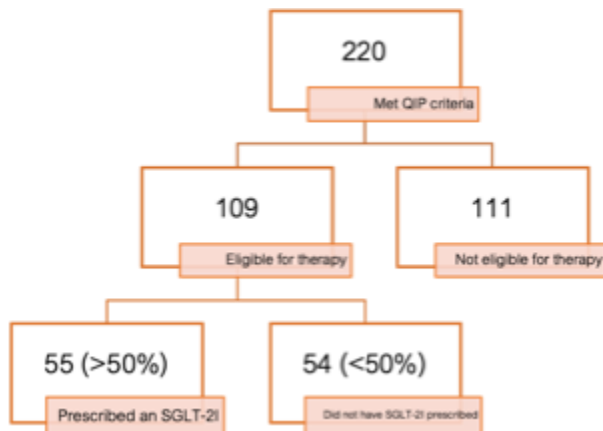
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Poster number: 424

Submission number: 209

Baseline characteristics of UK enrollees in TRACK, a prospective study of hyperkalemia management decision-making

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Dr Ameet Bakhai

Biography

Ameet Bakhai, a cardiologist, research director, chief research informatics officer and clinical safety officer at the Royal Free London NHS Trust, has enabled innovation of drugs, devices and diagnostics over 25 years. He co-chairs the UK Research and Development Clinical Directors Group, is a SME co-founder, pharma KoL, has published >120 papers and is a recognised leader in Clinical Trials Design, Real World Evidence, Technology Translation and Medical Education. He's received a national award for research from the Royal College of Physicians, been appointed to the Digital Health Clinical Advisory Group and has an extensive clinical, industry and regulatory network.

Abstract

Background: The TRACK study is a prospective, observational, multinational, implementation science study designed to address the evidence gap regarding healthcare provider decision-making and management of patients with hyperkalemia (HK).

Methods: The study enrolled patients with HK in the UK, Germany, Italy, Spain and US and is recording management decisions, treatment objectives and outcomes, HK recurrence and attainment of target renin-angiotensin-aldosterone system inhibitor (RAASi) dose during 12 months following an index episode of HK. The sample size provides a margin of error <3% to estimate endpoints of interest such as attainment of target doses of RAASi therapies at 12 months. Eligible participants are adults with serum K^+ >5.0 mmol/L collected during standard of care within 14 days prior to informed consent. Baseline characteristics of TRACK enrollees in the UK are presented descriptively.

Results: Enrolment of 1250 participants was completed over 17 months from July 2022 to December 2023. Baseline characteristics and initial HK management approach are shown for the 270 participants enrolled in the UK. Enrolment in the UK was completed during a 10-month span from December 2022 to October 2023. Chronic kidney disease (CKD) and/or heart failure was present in 91% of UK participants. At baseline, mineralocorticoid receptor antagonist (MRA) use was reported by 21 participants (8%) and other RAASi by 131 (49%). Among those taking MRA at baseline, downtitration or discontinuation during the qualifying HK episode was reported for 5/21 (24%). For those taking other RAASi at baseline,

downtitration/discontinuation of other RAASi was reported for 5/131 (4%). Median K$^+$ was 5.5 mmol (IQR 5.3, 5.7); median eGFR was 11.4 mL/min/1.73m^2 (IQR 4.6, 23.6). The most common management strategies for the index episode of HK, apart from monitoring serum K$^+$, were prescription of a low K$^+$ diet and use of K$^+$ binders (Table).

Conclusions: TRACK will characterize contemporary provider decision-making in patients with HK and its impact on HK recurrence across a broad range of patient types in a variety of practice settings in the UK and other countries.

Baseline characteristics and initial hyperkalemia management strategy

Variable	Value
N	270
Age, years, mean (SD)	62 (15)
Female, n (%)	81 (30)
CKD stage, n (%)	244 (90)
1-2	7 (3)
3	46 (19)
4	71 (29)
5	120 (49)
Dialysis, n (% of stage 5)	77 (64)
Heart failure, n (%)	52 (19)
HFmr/pEF	10 (19)
HFrEF	30 (58)
Other/not specified	12 (23)
Management strategy for index hyperkalemia episode, n*	269
No treatment, n (%)	63 (23)
Monitor K$^+$ level, n (%)	133 (49)
Low K$^+$ diet, n (%)	100 (37)
Reduce/stop ACEi/ARB/ARNI, n (%)	5 (4)
Reduce/stop MRA, n (%)	5 (24)
Start/increase K$^+$ binder, n (%)	12 (5)
Maintain K$^+$ binder, n (%)	5 (2)
Start/adjust dialysis, n (%)	5 (6)

*Participants may be counted in more than 1 row. For RAASi adjustments, percentages are of those taking the medication at baseline

ACE angiotensin converting enzyme inhibitor, ARB angiotensin receptor blocker, ARNI angiotensin receptor-neprilysin inhibitor, CKD chronic kidney disease, HFp/mrEF heart failure with preserved/mildly reduced ejection fraction, HFrEF heart failure with reduced ejection fraction, MRA mineralocorticoid receptor antagonist

Comparing prevalence estimates of advanced Chronic Kidney Disease

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Marian Adeyemo

Biography
Marian Adeyemo is an alumna of the University of Bristol, having recently earned an MSc in Public Health. She is currently a Fieldwork Researcher for the Nutrition and Physical Activity Self-Assessment in Childcare (NAPSACC) UK study at the University of Bristol. Before this role, she served as a Junior Data Analyst Intern with the UK Kidney Association through the 10,000 Black Interns program. Besides renal health, her other research interests include female reproductive, maternal, and child health.

Abstract

Introduction

Chronic Kidney Disease (CKD) is a global public health problem affecting 5-7% of adults in the UK. The aim of this study is to estimate the prevalence of advanced CKD from the UK Renal Registry (UKRR) and National Chronic Kidney Disease Audit (NCKDA), and compare with published estimates. Accurate estimation of CKD prevalence, specifically advanced stages, is critical to effective public health planning and targeted interventions.

Methods

Data were obtained from the UKRR (14 UK kidney centres, prevalent date 31 December 2019) and the NCKDA (911 GP practices in England and Wales, prevalent date 9 April 2016) indicating the number of adults with CKD 3b-5, including stratifications by age and sex. CKD stage was determined by eGFR using the latest creatinine within 2 years in the UKRR, while in the NCDKA, stage was determined by the two latest measurements at least 3 months apart. Denominators were based on age-sex-specific catchment populations of the submitting centres/practices. The point prevalence for the overall population and age-sex stratified, were calculated for each dataset. A scoping literature review was conducted using PubMed and Google Scholar databases and key terms related to "advanced chronic kidney disease" and "prevalence". Prevalence estimates were extracted, including age-sex specific estimates where available.

Results

A total of eight studies spanning the years 2010 to 2021 and set in four different countries/regions were included in addition to the UKRR and NCKDA data.[1-8] Six studies reported prevalence estimates for stages 4-5, and two for stages 3(b)-5.[3,8] Two studies reported period prevalence rather than point

prevalence.[1,2] Overall prevalence of stages 4-5 was 1.5 per 1000 in the UKRR and 3.0 per 1000 in the NCKDA; generally lower than published estimates which varied from 2 to 22.1 per 1000. Three published studies provided age-specific data[1,3,7], one of which, based on UK GP data, reported age-sex-specific prevalence[3]. After stratification, prevalence was generally lowest in the UKRR, particularly for stages 3b-5 (Figure 1 and Table 1). The increase in log-prevalence with age was consistent across studies, demonstrated by the parallel lines (Figure 1). Prevalence was lower in females in the UKRR data across all age groups, a pattern not seen in other studies.

Discussion

Our study is the first to compare age- and sex-specific CKD prevalence from multiple UK kidney centres with estimates from primary healthcare and other published data. We showed considerable variation in prevalence estimates from the literature, UKRR, and NCKDA data, some of which can be explained by differences in study designs and reporting periods. People with stage 3b CKD are more likely to be managed by their GP than by a kidney centre and hence not appear in the UKRR, but discrepancies also exist for stages 4-5 amongst younger people. Additional UKRR data suggest that younger people are more likely to have delayed referrals to renal services, possibly due to increased disregard of symptoms and missed appointments.

Figure 1 Age-sex-specific estimates of CKD prevalence from the UKRR, NCKDA and published literature for stages4-5 (A) and stages3b-5 (B). For J Park et al., zero prevalence was recorded for ages 20-39 which is not shown on the plot due to the log scale. AK Bello et al. reported period prevalence over 5 years.
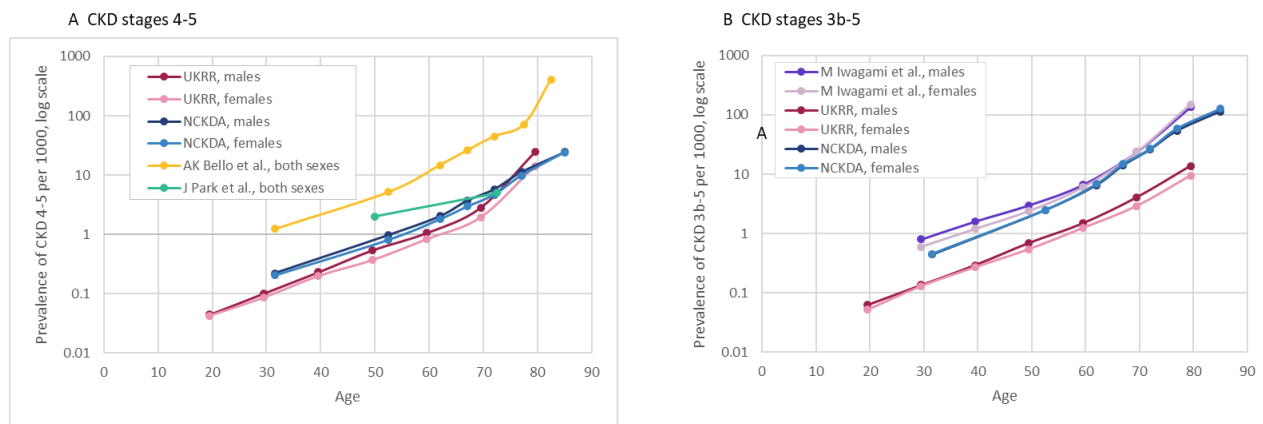
Table 1 Age-sex-specific estimates of CKD prevalence from the UKRR, NCKDA and published literature for stages4-5 and stages3b-5

Study	Age group	Stage 4-5		Stage 3b-5	
		Males	Females	Males	Females
UKRR	18-24	0.04	0.04	0.06	0.05
	25-34	0.10	0.09	0.14	0.13
	35-44	0.23	0.20	0.29	0.27
	45-54	0.54	0.37	0.7	0.55
	55-64	1.05	0.83	1.49	1.24
	65-74	2.83	1.94	4.07	2.91
	75+	24.41	14.24	13.78	9.49
NCKDA	18-45	0.22	0.21	0.44	0.45
	46-59	0.97	0.81	2.5	2.49
	60-64	2.03	1.81	6.55	6.82
	65-69	3.7	2.95	14.17	14.92
	70-74	5.75	4.67	26	26.77
	75-79	11.21	9.75	53.92	59.09
	80+	24.48	24.08	114.16	127.07
M Iwagami et al.	25-34			0.8	0.6
	35-44			1.6	1.2
	45-54			3	2.4
	55-64			6.6	6
	65-74			23.6	23.6
	75+			134.9	151.4
		Both sexes			
AK Bello et al.	18-45	1.23			
	46-59	5.17			
	60-64	14.74			
	65-69	25.92			
	70-74	44.9			
	75-80	71.35			
	80+	406.18			

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Management of respiratory virus outbreak in a small satellite haemodialysis unit in London.

Dr Colley Crawford, Sister Roble Abdella, Sister Basilio Fiona

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Dr Colley Crawford

Biography
I am a specialty doctor in Nephrology working at a large teaching hospiital in London and also providing haemodialysis and general nephrology cover in a satellite unit in the North West London suburbs.

Abstract

Introduction

In late 2023, many of the respiratory precautions taken during the Covid-19 pandemic had been dropped by haemodialysis units. Our unit noted a cluster of severe respiratory infections in December 2023. We describe the management of a simultaneous outbreak of both Covid-19 and Influenza A virus in a small satellite dialysis unit in London.

Methods

Measures were put into place to identify, treat and isolate patients with respiratory viruses after 4 patients developed severe respiratory symptoms with 3 testing positive for Influenza A.. All patients on the unit were swabbed for respiratory viruses. A vaccination audit for influenza and covid 19 was performed and unvaccinated patients were offered vaccination. All Influenza patients were treated with Oseltamivir and all formally immunosupressed patients accepted prophylactic doses . Mask wearing had remained compulsory since the pandemic but was more strictly enforced on the unit for staff and patients. Temperature checks and symptom checks were performed on the threshold of the dialysis unit. a daily audit of standard precautions ; hand hygiene and environmental and enhanced environmental cleaning took place.Terminal cleaning was performed after each Covid-19 positive dialysis .The unit was closed to new patients.

Results

Of 77 patients 7 tested positive for Influenza A; 7 for Covid-19; 2 for seasonal covid; 1 for respiratory syncytial virus; 1 for Rhinovirus ; 1 for Parechovirus. A Covid - 19 outbreak was declared and reported.

19 out of 77 patients in this unit were found to have a respiratory virus but only the Influenza patients were symptomatic. All Influenza a patients were symptomatic. 1 died as direct result of the infection; 1 required intubation on intensive care for respiratory failure and 1 required hospitalisation. The

remaining 4 developed symptoms that were managed at home. The three patients most severely infected had clear idnetifiable risk fators for severe infection : smoker with myeloma ; severe COPD and smoker ; renal cancer .Oseltamivir was well tolerated and the course was completed by all patients.

   Isolation of those with respiratory viruses was highly problematic and required rescheduling of a large number of patients. The unit has only 2 isolation rooms in which dialysis chairs only can fit. Patients who normally required beds therefore needed to dialyse on chairs. Patients normally isolated for CPO or VRE were dialysed in corner beds with curtains drawn and terminal cleaning performed, in order to accommodate the need for respiratory isolation. A Covid-19 positive twilight shift was created to cohort those with Covid-19 as individual isolation was not feasible

Conclusion

A simultaneous outbreak of Covid-19 and Influenza a was declared in a small haemodialysis unit. All viruses except for Influenza were asymptomatic . Influenza A was highly symptomatic despite 100% vaccination rates in those infected. The need for respiratory isolation caused major disruption and signficantly increase work-load .The need for enhanced infection control was also time-consuming and labour intensive. As a small unit patients are often waiting in very close proximity particular as they await transport and high demand for hospital transport means that many patients travel together to and from dialysis which may increase the transmission of respiratry viruses between patients. This reinforces the need for ongoing vigilance with regard to respiratory viruses on dialysis .The virulence of Influenza A compared to Covid-19 infection in this population during this period and the rate of asymptomatic Covid-19 infection is demonstrated.

Poster number: 427

Submission number: 284

CKD coding guidelines and data sources for CKD metrics: a London Kidney Network report

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Ms Linda Tarm

Biography
Linda Tarm is the Clinical Co-Chair of the Chronic Kidney Disease (CKD) Prevention Workstream within the London Kidney Network. She provides strategic oversight and leadership to ensure the workstream is on track to achieve its aims, which includes supporting primary care to optimise early identification, coding and management of CKD. Linda's role has a strong focus on collaboration and cross-partnership working with primary and secondary care, both at local and national level. Linda qualified as a Dietitian in New Zealand and was awarded a National Institute for Health & Research Bursary to complete a Masters in Clinical Research in London. Prior to joining the London Kidney Network, Linda led the Guy's & St Thomas' Renal Dietetic Service. She has extensive clinical and renal experience and is particularly interested in preventative care and improving patient outcomes. Linda has established effective partnerships across networks, organisations, teams and at an individual level.

Abstract

Introduction

Accurate coding of chronic kidney disease (CKD) facilitates CKD diagnosis and management. Uncoded patients with CKD have poorer outcomes[1]. National audit data[1] suggests coding rates vary significantly with some practices having 80% of patients uncoded.

There are 2 challenges with coding. Firstly, CKD detection tends to be skewed towards bloods rather than urine values. The Quality and Outcomes Framework (QoF) definition of CKD (stages G3a to G5) is based largely on estimated Glomerular Filtration Rate (eGFR) rather than urine Albumin to Creatine Ratio (uACR). Potentially, missing CKDG1 and CKDG2 with albuminuria means it may not be coded and therefore not treated. Secondly, there is variation in the terminology used to code and define CKD. This also tends to be weighted towards blood tests and the plethora of possible codes can be both confusing and counterproductive.

The aim of the London Kidney Network (LKN) CKD Prevention Workstream was to produce guidelines on CKD coding in primary care to:

1. Facilitate consistent coding to help with appropriate diagnosing and data capture
2. Facilitate an accurate approach to coding, i.e. including blood and urine values
3. Develop clinically meaningful CKD metrics for aligning with the vision of the LKN
4. Investigate robust data sources to facilitate formal reporting on CKD metrics

Methods

The LKN brought together clinicians (e.g. nephrologists, GPs, AHP) to produce guidelines on coding and appropriate CKD metrics. These guidelines align with relevant NICE,[2] KDIGO[3] and LKN [4] recommendations on CKD care. We also investigated sources of robust, freely available data to support reporting on CKD metrics and compared these data sources with our proposed metrics.

Results

Five key recommendations in our guidelines:

1. Include both the blood (eGFR) and urine (ACR) values relevant to CKD detection and coding
2. Avoid higher level coding (e.g. Chronic Renal Impairment) as it does not align to intricacies of CKD staging, tracking and management
3. In cases where disease specific nomenclature may be relevant and used (e.g. Diabetic nephropathy), include both the blood and urine values relevant to that diagnosis in coding
4. Use the eGFR/uACR combination SNOMED codes when coding for CKD[5]
5. Use a uniform CKD coding classification (G and A staging) in line with NICE guidance[2]

Figure 1: CKD Metrics and their availability within CVD Prevent, RSTP Dashboard, QoF/GP contracts and Open prescribing

CKD metrics and their availability within four data sources			Is the data available in CVD Prevent?	Is the data available in RSTP Dashboard?	Is the data available in QoF/GP Contracts?	Is the data available in Open Prescribing?
CKD Identification	1	Proportion of people with diabetes who have had an eGFR and uACR in the past 12 months	Yes	No	No	N/A
	2	Proportion of people on QOF HTN register who have had an eGFR + uACR in past 12 months	No	No	No	N/A
CKD Monitoring	3a	Proportion of people (%) on CKD Register who have had an eGFR measured in last 12	Yes	Yes	No	N/A
	3b	Proportion of people (%) on CKD Register who have had an uACR in last 12 months	Yes	Yes	Yes	N/A
CKD Management	4	Proportion of people coded with Diabetes and CKD with uACR>3 prescribed ACEi or ARB	No	No	No	No
		Proxy for metric 4: % of patients aged 18 and over with GP recorded CKD (G3a to G5), hypertension and proteinuria, currently treated with renin-angiotensin system antagonists	Yes	N/A	Yes	No
	5	Proportion of people coded with CKD and Type 2 diabetes prescribed with an SGLT-2i	No	No	No	No (use proxy)
CKD Not Coded	6	People who have 2 x eGFR <60 at least 90 days apart but are not coded for CKD	TBC	Yes	No	N/A
	7	People who have 2 x uACR >3 at least two weeks apart but that are not coded for CKD	No	No	No	N/A
	8	People who have 1 x uACR >70 but who are not coded for CKD	No	No	No	N/A

Discussion

Our guidelines were launched in March 2023. Supporting awareness and education of our guidelines has provided valuable insight into the barriers and enablers to better coding across London. No one data source encompasses the needs of the LKN reporting on CKD metrics.   Obtaining data around appropriate medication use for given comorbidities was a particular challenge, e.g. appropriate ACE/ARB/SGLT2i use.

We will be reviewing CKD related data across London in order to:

1. Explore and understand recording and variation in CKD coding across primary care in London

2. Determine any potential impact of our guidelines on CKD coding after launching them
3. Help identify areas that may need support to improve CKD coding
4. Further investigate data sources on appropriate medication optimisation in CKD cohorts

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3. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease (Volume 3, Issue 1, January 2013)
4. London Kidney Network CKD Early Identification & Optimisation Pathways, launched September 2022, https://londonkidneynetwork.nhs.uk/preventing-progression/

Poster number: 428

Submission number: 370

Analysis of antimicrobial sensitivites in blood culture positive dialysis patients

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Dr Takudzwa Dhlandhlara

Biography
Dr Dhlandhlara is a Junior Clinical Fellow at South West Thames Renal and Transplantation Unit, Epsom and St Helier University Hospitals NHS Trust.

Abstract

Introduction

Infection is a common cause of morbidity and mortality in patients on renal replacement therapy (RRT). The majority of bacteraemias in haemodialysis (HD) patients are related to the vascular access and Vancomycin and Gentamicin are the empirical antibiotics used for treatment of dialysis line sepsis in our unit. We conducted this study to identify the susceptibility of micro-organisms to these antibiotics over the study period, to determine whether they were still a reasonable choice, and also to compare sensitivities of other agents such as Teicoplanin, Ciprofloxacin and Ceftazidime as potential alternatives for empirical treatment.

Methods

This was a retrospective cohort study of HD patients who had positive blood cultures between May 2019 – December 2023. Data on positive blood cultures and sensitivity patterns were collected from an electronic database and statistical analysis was done with Microsoft Excel.

Results

There were 481 bacteraemias, of which 411 (85%) were from patients undergoing HD. Micro-organisms isolated were: Gram positive 365 (76%), and Gram negative 113 (23%). Of the Gram positive organisms, 28 (7.9%) were Enterococci; 264 (80 %), were staphylococci, of which MSSA = 102(38%), MRSA = 8 (3%) and coagulase negative = 154 (49%). Gram negative organisms were: E.coli 34%, Klebsiella sp 30%, Pseudomonas sp 11%, other species 26% (including proteus, stenothrophomonas, serratia and morganella spp.).

Vancomycin susceptibilities:

Staphylococci - all were Vancomycin sensitive. Data on Teicoplanin were available in 107 patients and of these, 20 (23%) were resistant to Teicoplanin.

Enterococci - 13 (39%) were resistant to Vancomycin. There was a marked increase in Vancomycin resistant enterococci in 2020, which fell in the subsequent years (figure 1).

Gentamicin susceptibilities:

In the Gram negative bacteraemias, data were available on Gentamicin sensitivity in 105 cases. Of these, 20 (19%) were Gentamicin resistant. 1.3% of the E.coli and 73% of the Klebsiella were resistant to Gentamicin, but all of the pseudomonas sp were sensitive to Gentamicin.

In the cases with Gentamicin resistant Gram negative organisms, the rate of resistance to Ciprofloxacin was 80%, and to Ceftazidime, it was 60%.

Discussion

In this cohort of patients, Vancomycin seems to be a very good empirical antibiotic in patients with Staphylococcal bacteraemia, but less so with enterococci. As staphylococcal species were by far the dominant Gram positive isolates, we feel there is justification for continuing to use Vancomycin as our first line agent.

In the cases with Gram negative bacteraemias, Gentamicin resistance was present in 19%, mainly in patients with Klebsiella. Potential alternatives such as Ciprofloxacin and Ceftazidime had much higher rates of resistance and would therefore not be viable alternatives for empirical treatment.
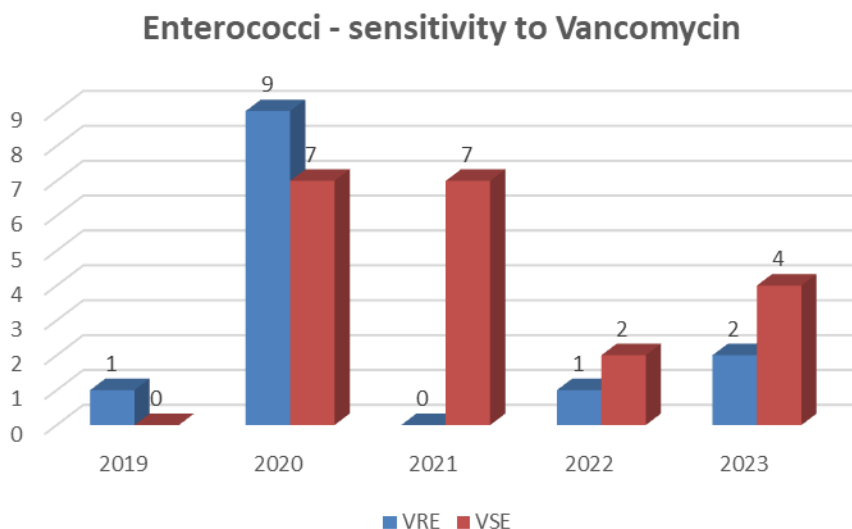

Figure 1.

Poster number: 429

Submission number: 483

Remote digital albuminuria testing in high risk groups: what can we learn and can we make it equitable? Analyses of a year-long roll out

Dr Kathryn Griffiths[1,2,3], Ms Sheila Taylor[4], Dr Mariam Molokhia[1], Dr Kate Bramham[1,2]

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Dr Kathryn Griffiths

Biography
I am a renal registrar undertaking a PhD in inequalities within chronic kidney disease detection and management. I also work in Lewisham population health and care team as an inequalities fellow.

Abstract

Introduction

Albuminuria testing is a sensitive and non-invasive way to identify early chronic kidney disease (CKD) which can facilitate early disease management and reduce the burden of progression to end stage kidney disease (ESKD) and cardiovascular events.

Remote albumin creatinine ratio (ACR) testing using smart phone technology (semi-quantitative analysis) could provide an approach to diagnose early CKD with minimal impact on the individual and primary care capacity but understanding of optimal practice within existing systems and ensuring avoiding exacerbating health inequity in CKD diagnosis for underserved communities is limited.

Methods

6082 patients with a diagnosis of diabetes and no ACR in last 12 months were sent a remote digital albuminuria test in a diverse population in South East London (SEL) between July 2022 and June 2023. Anonymised data were extracted from EMIS primary care systems after exclusion of those who had dissented from data use. Responses and results were compared between CORE20 and non-CORE20 participants (defined as residing in the UK 20% most socio-economically deprived areas, Townsend score of >2.516). Data were analysed by PowerBI and StataSE18.

Results

Recipients of remote ACR kits had a median age 61 years (range 19-102); 3364 (55%) were male and 2784 (46%) were CORE20. Further characteristics, proportion of completed tests and semi-quantitative results are displayed in table 1. 2845 (46.8%) of people completed the test, 590 (20.7%) had abnormal (3.39-33.9mg/mmol) and 230 (8.1%) had high abnormal (> 33.9mg/mmol) results.

Table 2 shows unadjusted and adjusted odds ratios of completing testing. People were less likely to complete testing if over 70 years (OR 0.71, 95% CI 0.57 - 0.89) and over 80 (OR 0.43, CI 95% 0.33 - 0.56) compared to <40 years old when adjusted for ethnicity, sex, socio-economic status, spoken language, previous ACR testing and number of primary care contacts in the last 5 years. People from CORE20 groups were also less likely to complete testing (OR 0.68, 95% CI 0.61 - 0.76) than non-CORE20 and those with missing data (e.g. unspecified ethnicity or unspecified main spoken language) and those with no recorded healthcare interactions within the last 5 years were also less likely to complete testing.

Discussion

These findings demonstrate that remote ACR testing presents an opportunity to diagnose early CKD but there is still inequity in who completes testing. Further work is needed to explore confirmation of positive results with laboratory testing and consequent changes in care. Engagement with stakeholders is needed to inform targeted remote testing, and to explore innovative ways to support those who are not currently able to undertake ACR testing either remotely or in primary care to achieve equitable CKD screening.

Table 1: Characteristics of cohort, proportion of completed remote digital albuminuria tests and corresponding semi-quantitative results.

Characteristic	Total	Completed tests within 3 months		Remote digital albuminuria semi-quantitative results (N = 2845) Normal <3.39 mg/mmol		Abnormal 3.39-33.9mg/mmol		High abnormal > 33.9 mg/mmol	
	N = 6082	n= 2845 (46.8%)		n= 2025 (71.2%)		n= 590 (20.7%)		n= 230 (8.1%)	
Current age (years)									
<40	446	212	(47.5)	162	(76.4)	41	(19.3)	9	(4.2)
40 – 49	698	366	(52.4)	279	(76.2)	65	(17.8)	22	(6.0)
50 – 59	1544	795	(51.5)	580	(73.0)	146	(18.4)	69	(8.7)
60 – 69	1623	811	(50.0)	599	(73.9)	152	(18.7)	60	(7.4)
70 – 79	1162	474	(40.8)	307	(64.8)	121	(25.5)	46	(9.7)
> 80	609	187	(30.7)	98	(52.4)	65	(34.8)	24	(12.8)
Sex									
Male	3364	1563	(46.5)	1090	(69.7)	325	(20.8)	148	(9.5)
Female	2718	1282	(47.2)	935	(72.9)	265	(20.7)	82	(6.4)
Ethnicity:									
White European, White other	3347	1609	(48.1)	1164	(72.3)	323	(20.1)	122	(7.6)
Asian, South Asian, Chinese, Asian other	1208	557	(46.1)	395	(70.9)	114	(20.5)	48	(8.6)
African, Caribbean, Black British, Black other	1089	487	(44.7)	325	(66.7)	114	(23.4)	48	(9.9)
Mixed multiple ethnic groups, ethnicity other	194	97	(50.0)	71	(73.2)	21	(21.6)	3	(3.1)
Ethnicity not specified	244	95	(38.9)	70	(73.7)	18	(18.9)	9	(9.5)
Socioeconomic Status:									
Non CORE20	3255	1653	(50.8)	1208	(73.1)	328	(19.8)	117	(7.1)
CORE20	2784	1175	(42.2)	808	(68.8)	255	(21.7)	112	(9.5)
Not specified	43	17	(39.5)	9	(52.9)	7	(41.2)	1	(5.9)
Main spoken language:									
English	2780	1347	(48.5)	952	(70.7)	286	(21.2)	109	(8.1)
Not English	751	331	(44.1)	225	(68.0)	269	(81.3)	37	(11.2)
Not specified	2551	1167	(45.7)	848	(72.7)	235	(20.1)	84	(7.2)
Number of clinical primary care contacts in the last 5 years:									
0	1055	421	(39.9)	310	(73.6)	85	(20.2)	26	(6.2)
1 – 10	3594	1725	(48.0)	1247	(72.3)	345	(20.0)	133	(7.7)
11 – 20	1090	531	(48.7)	356	(67.0)	126	(23.7)	49	(9.2)
> 20	343	168	(49.0)	112	(66.7)	34	(20.2)	22	(13.1)
Previous record of laboratory albuminuria test									
No previous test recorded	2268	1087	(47.9)	856	(78.7)	191	(17.6)	40	(3.7)
<3.39 mg/mmol	2759	1329	(48.2)	1009	(75.9)	253	(19.0)	67	(5.0)
3.39 – 33.39 mg/mmol	887	368	(41.5)	155	(42.1)	131	(35.6)	82	(22.3)
>33.9 mg/mmol	168	61	(36.3)	5	(8.2)	15	(24.6)	41	(67.2)

Table 2 Crude and adjusted odd ratios for completing remote digital albuminuria test.

Characteristic	Odds ratio (95% CI)			
	Crude		Fully adjusted for all characteristics in table	
Total				
Current age (years):				
<40	1.00	(reference)	1.00	(reference)
40 − 49	1.22	(0.96 – 1.54)	1.24	(0.97 − 1.57)
50 − 59	1.17	(0.95 − 1.45)	1.17	(0.95 − 1.46)
60 − 69	1.10	(0.89 − 1.36)	1.07	(0.86 − 1.46)
70 − 79	0.76	(0.61 − 0.95)	0.71	(0.57 − 0.89)
> 80	0.49	(0.38 – 0.63)	0.43	(0.33 − 0.56)
Sex:				
Male			1.00	(reference)
Female			1.10	(0.99 − 1.22)
Ethnicity:				
White European, White other			1.00	(reference)
Asian, South Asian, Chinese, Asian other			0.96	(0.83 − 1.11)
African, Caribbean, Black British, Black other			0.93	(0.81 − 1.08)
Mixed multiple ethnic groups and ethnicity other			1.09	(0.80 − 1.48)
Ethnicity not specified			0.75	(0.58 − 0.98)
Socioeconomic Status:				
Non CORE20			1.00	(reference)
CORE20			0.68	(0.61 − 0.76)
(Townsend score >2.516)				
No Townsend score recorded			0.56	(0.30 − 1.05)
Main spoken language:				
English			1.00	(reference)
Not English			0.88	(0.74 − 1.06)
Not specified			0.86	(0.77 − 0.96)
Number of clinical primary care contacts in the last 5 years:				
0			1.00	(reference)
1 – 10			1.38	(1.19 − 1.59)
11 – 20			1.44	(1.20 − 1.72)
> 20			1.63	(1.26 − 2.11)
Previous record of laboratory albuminuria test				
No previous test recorded			0.96	(0.85 − 1.07)
<3 mg/mmol			1.00	(reference)
3 − 30 mg/mmol			0.81	(0.69 − 0.94)
31 − 69 mg/mmol			0.71	(0.46 − 1.10)
> 70 mg/mmol			0.54	(0.34 − 0.84)

Occult (Mutant) Hepatitis B virus in a haemodialysis patient: Implications for infection control practice

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Dr Pramod Nagaraja

Biography
Consultant Nephrologist and Transplant Physician since 2015 Clinical Lead for Kidney Transplantation at the Cardiff Transplant Unit Special interest in BBV in relation to haemodialysis practice I manage a satellite dialysis unit

Abstract

Introduction

 UK Kidney Association's blood-borne virus management guidelines recommend screening for Hepatitis B virus (HBV) surface Ag (HBsAg) prior to starting haemodialysis, and then at 3-6 monthly intervals. Here, we report the detection of HBV with a surface antigen mutation in an end-stage kidney failure patient undergoing haemodialysis (HD) and discuss its implications for infection control practice. A 73-year old female of South-East Asian origin started HD in October 2021. HBsAg was negative from 2018 until the time of starting HD. Hence, she was dialysed in an open area in a satellite HD unit with no machine isolation. Routine 3-monthly surveillance for HBsAg was negative. During an unrelated inpatient stay in 2023, blood HBV DNA PCR testing was undertaken. HBV DNA was detected (2591 IU/ml). This detection of new HBV infection required enhanced surveillance within the HD unit. This report highlights the pitfalls in the current UK guidance for HBV screening based on HBsAg alone.

 Methods

Following the detection of HBV DNA, the patient and her dialysis machine were isolated. An infection control group was setup. We performed enhanced surveillance for HBV markers on all patients who had dialysed since 2021 in the same unit as the index patient. This included HBsAg and HBV core antibody (HBcAb) as per UKKA guidelines, and HBV DNA PCR (not currently in UKKA guidelines) in view of occult infection in the index patient (HBsAg negative); and a one-off test for immunity (HBV surface antibody (HBsAb) titre).

Results

A total of 75 patients were identified. One patient with known chronic (HBsAg positive) HBV infection was excluded. The remaining 74 patients were all negative for HBsAg and HBV DNA PCR during the surveillance period. HBcAb was positive in 7 out of 74 patients (9.5%) suggesting a past HBV infection. HBsAb levels were as follows: <10 IU/L in 53 patients, 10-100 IU/L in 10 patients and >100 IU/L in 11 patients. Retrospective testing of the index patient's blood samples confirmed chronic occult infection with HBcAb and HBV DNA detected in November 2022.

Discussion

Despite a low prevalence of immunity to HBV, there was no evidence of HBV DNA transmission from the index patient. HBV DNA PCR was tested in all patients during surveillance as surface antigen mutations could render the HBsAg assay unreliable. Diligent cleaning and disinfection of dialysis machines and patient areas according to protocol are likely to have avoided transmission. Guidance also states patients should be HBV vaccinated.

We recommend that clearer guidance is needed for HBV screening in haemodialysis patients. We propose that in addition to HBsAg alone as currently stated, HBcAb should also be tested prior to starting HD, and HBV DNA tested if HBcAb is positive, as there is a risk of reactivation of HBV which may be occult during immunosuppression and cachectic states. Although currently rare, there is potential for increased incidence of occult HBV. We should detect occult HBV infection prior to starting HD to avoid the need for time-consuming and costly enhanced surveillance.

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Using a linked database to identify inequalities in Chronic Kidney Disease in a diverse population: creating opportunities for collaborative quality improvement

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Dr Kathryn Griffiths

Biography
Renal SpR and research fellow undertaking a PhD in CKD inequalities. Population health fellow with Lewisham population health team.

Abstract

Introduction

The Lewisham population health and care team work with a linked data base which allows them to track their population through routine, community, mental health and acute medical services. The team use this platform to engage with stake holders within the borough including primary care, acute trust, public health and local authority.

In line national priorities around chronic kidney disease (CKD) as part of cardiovascular co-morbidity we have have begun a selection of insight work intended to direct resources to reduce inequalities within CKD.

We looked to generate insights within our population to inform a local, informed strategy to improve and reduce unwanted variation in CKD outcomes.

Method

The linked database (Healtheintent) holds information from 340,047 residents within the borough (those dissenting from data sharing are excluded prior to analysis). We looked at characteristics of those who do and do not have a CKD diagnosis (as identified in either primary or secondary care) with biochemical markers consistent with CKD stage 3 and above (two eGFR measurements <60 performed 3 months apart). Definition of CORE20 population were those living in the 20% most deprived areas within the UK (defined here as IMD decile 1+2), the definition for plus ethnicity was any minority ethnicity and plus vulnerable is a locally devised list of vulnerable features which is set by a population (factors such as a history of domestic abuse, time in prison etc). Logistic regression was performed to identify characteristics associated with lower odds of CKD coding.

Results

Table 1 describes the characteristics of the population analysed and is reflective of the diversity and relative deprivation of the South London borough. The sample analysed was relatively elderly which is reflective of the co-exitance of CKD with other co-morbidities. A large proportion of the population (8030, 75.4%) had a diagnosis of hypertension as compared with 4721 (44.4%) having a diagnosis of diabetes.

Table 2 shows crude and adjusted odds ratios for those with biochemical evidence of CKD stage 3 and above having a CKD diagnosis. Logistic regression demonstrated higher odds of a CKD diagnosis in those with higher emergency admissions, over 80 years old, with a diagnosis of hypertension, in CORE20 groups and of Black African, Caribbean or Black British heritage.

Table 1: characteristics of cohort with biochemical CKD

Characteristic	Total		Clinical code of CKD in primary or secondary care			
			Yes		No	
	N = 10,663		n= 7585 (71.1%)		n= 3078 (28.9%)	
Sex:						
Male	4866	(45.8)	3426	(45.3)	1440	(46.9)
Female	5764	(54.2)	4131	(54.7)	163	(53.1)
Age (years):						
18 − 39	209	(2.7)	204	(2.7)	86	(2.8)
40 − 49	684	(6.4)	415	(5.5)	269	(8.8)
50 − 59	1756	(16.5)	1123	(14.9)	604	(19.7)
60 − 69	2393	(22.5)	1748	(23.1)	633	(2.6)
70 − 79	2585	(24.3)	1749	(23.1)	644	(3.0)
>80	2921	(27.5)	2318	(30.7)	837	(27.2)
Ethnicity:						
White British or other	4206	(39.6)	3105	(41.1)	1101	(35.8)
Black African, Caribbean, Black British or other	3928	(37.0)	2808	(37.2)	1120	(36.5)
South Asian, Asian British	556	(5.2)	348	(4.6)	208	(6.8)
Chinese	108	(1.0)	72	(1.0)	36	(1.2)
Other Ethnic group	508	(4.8)	347	(4.6)	161	(5.2)
Mixed Ethnicities	395	(3.7)	265	(3.5)	130	(4.2)
Not stated or unknown	932	(8.8)	615	(8.1)	317	(10.3)
IMD quintile:						
1 (lowest)	2903	(27.3)	2083	(27.6)	820	(26.7)
2	4702	(44.2)	3355	(44.4)	1347	(43.8)
3	2258	(21.2)	1564	(20.7)	694	(22.6)
4	707	(6.7)	514	(6.8)	193	(6.3)
5 (highest)	53	(0.5)	38	(0.5)	15	(0.5)
Unknown	7	(0.1)	3	(0.1)	4	(0.1)
CORE20PLUS:						
CORE20	2906	(27.3)	2085	(27.6)	821	(26.7)
Non CORE20	2850	(26.8)	2088	(27.6)	762	(24.8)
Plus Ethnicity	4314	(40.6)	2956	(39.1)	1358	(44.2)
Plus Vulnerable	560	(5.3)	428	(5.7)	132	(4.3)
Co−morbidities						
Diabetes	4721	(44.4)	3095	(41.0)	1626	(52.9)
Hypertension	8030	(75.4)	5904	(78.1)	2126	(69.2)
Severe mental illness	438	(4.1)	306	(4.1)	132	(4.3)
Emergency attendances:						
0	7458	(70.2)	5113	(67.7)	2345	(76.3)
1−11	3157	(29.7)	2431	(32.2)	726	(23.6)
12 or more	15	(0.1)	13	(0.2)	2	(0.1)

Table 2: crude and adjusted odds ratios for having a coded diagnosis of CKD in primary OR secondary care systems for those with biochemical evidence of CKD stage 3 (shaded rows denote those with wide confidence intervals due to low sample size)

Characteristic	Odds ratio (95% CI)			
	Crude		Fully adjusted for all characteristics in table	
Age (years):				
18 − 39	1.53	(1.14 −2.06)	1.62	(1.19 −2.20)
40 − 49	1.00	(reference)	1.00	(reference)
50 − 59	1.15	(0.96 − 1.38)	1.16	(0.96 − 1.40)
60 − 69	1.35	(1.14 − 21.61)	1.37	(1.15 − 1.65)
70 − 79	1.76	(1.47 − 2.10)	1.76	(1.46 − 2.13)
>80	2.48	(2.08 − 2.96)	2.29	(1.90 −2.77)
Sex:				
Male			1.00	(reference)
Female			0.95	(0.87 −1.03)
Ethnicity:				
White British or other			1.00	(reference)
Black African, Caribbean, Black British or other			1.18	(1.02 −1.38)
South Asian, Asian British			0.89	(0.71-1.12)
Chinese			1.01	(0.65 −1.65)
Other Ethnic group			0.96	(0.76 −1.21)
Mixed Ethnicities			0.99	(0.77 − 1.02)
Not stated or unknown			0.86	(0.72 − 1.02)
IMD quintile:				
1 (lowest)			1.00	(reference)
2			1.04	(0.94-1.16)
3			0.99	(0.87 −1.12)
4			1.05	(0.87 − 1.26)
5 (highest)			1.26	(0.65 −2.40)
Unknown			2.15	(0.25 − 18.36)
CORE20PLUS:				
CORE20			1.00	(reference)
Non CORE20			0.96	(0.83 − 1.12)
Plus Ethnicity			0.85	(0.76 −0.95)
Plus Vulnerable			1.22	(0.97 − 1.54)
Co-morbidities				
Diabetes			0.53	(0.49 − 0.58)
Hypertension			1.55	(1.40 − 1.72)
Severe mental illness			0.97	(0.78 − 1.21)
Emergency attendances:				
0			1.00	(reference)
1−11			1.47	(1.33 − 1.63)
12 or more			2.41	(0.54 − 10.86)

Discussion

The nuances of the Lewisham population give insight in to priorities for improving CKD diagnosis and management and allows the tailoring of services to match the need which differs from the UK as a whole due to the relative ethnic diversity and deprivation. This data demonstrates these groups have increased odd of diagnosis. As a population health team we are currently engaging with local clinicians, clinical effectiveness groups as well as commissioners to disseminate insights with a view to supporting improvement driven by population data. Next step to develop a series of sustainable quality improvement projects to improve identification of CKD which can be evaluated by our database and to look at corresponding changes in care / optimisation following identification in our cohort.

Compliance towards prescribing a skin decolonisation regime for hemodialysis patients at CVC insertion

Leah-kate Butler, Osama Hendam, Ahmed Mohamed, Zainab Groof, Ranvir Kalra, Radia Choudhury, Jyoti Baharani

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Leah-kate Butler

Biography
I qualified from Coventry University in 2017, post-graduation I spent a short time as a nurse on the trauma and orthopaedics ward at Heartlands hospital. I then Joined the Renal team as a haemodialysis nurse in 2018 where I found my passion in renal and later gained an interest in vascular access, shared care and education. In 2022 I was fortunate enough be appointed a job within the Renal vascular access team at heartlands hospital, continuing my passion caring for renal patients. Throughout my nursing journey I have worked closely with the MDT gaining experience and knowledge in vascular access, educating staff and patients in order to provide the best possible care for dialysis patients throughout their journey.

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Abstract

Background:

Bloodstream infections associated with central venous catheters (CVCs) are an important cause of hospitalizations, morbidity, and mortality in patients receiving hemodialysis.1

Dialysis patients are frequently exposed to pathogens whilst attending for dialysis or during hospitalisation. The hemodialysis vascular access is a potential entry site for S. aureus, in particular when using a central venous catheter (CVC) which increases the risk of sepsis compared to arteriovenous (AV) fistula.9

 As part of the process when CVC is inserted, or changed, patients should be routinely given preventative decolonisation treatment to prevent infection.

While an arteriovenous fistula is the best long term access method for haemodialysis, some patients may require emergency dialysis, or only require dialysis in the short term. These patients may benefit from a temporary line for arteriovenous access in these situations.

The overall death rate from S. aureus bacteremia after 12 weeks of follow-up was 34 percent, in a retrospective cohort study of 22,130 hospitalizations of hemodialysis patients with septicemia. The death rate was 20 percent higher than the death rate from bacteremia due to all other organisms.10

Lower rates of catheter-related bacteremia have been reported with the use of various exit-site protocols .8

Aim:

Increase awareness of all clinical staff to comply with 100 % decolonization prescription regime to hemodialysis patients with new catheter insertion and subsequently to decrease risk of catheter related infections.

To ensure that all clinical ward staff review medications daily on the trusts electronic prescribing and information system, for hemodialysis catheter patients. And to make sure that decolonization prescription is prescribed either prior or on the day of line insertion.

Standard:

Decolonisation regime: Prior/at day of hemodialysis catheter insertion to day 5,

to use once a day Octenisan body wash and Mupirocin ointment to be applied for patient's nostrils three times a day.

Renal team to ensure protocol is prescribed as inpatient and on discharge prescription to complete total of five days after hemodialysis catheter insertions.

Methodology:

We have retrospectively looked at a cohort of 30patients with acute and chronic hemodialysis who had new tunneled and non tunneled hemodialysis catheter insertions from March to June 2022.

Second cycle looked at a cohort of 18 patients in August 2022, that had a new tunneled and non tunneledhemodialysis catheter inserted.

Patients were identified and data collected from thehospital electronic system.

UpToDate and PubMed guidelines3,7

Results:

The first cycle showed that only 53% of line insertions were prescribed decolonization. By the second cycle the compliance towards prescribing decolonization had improved, showing 67% of line insertions were prescribed decolonisation .

In The first cycle one patient developed an infected exit site and bacteraemia 20 days post CVC insertion.The other patient who developed a staph aureus bacteraemia with the line being a potential

source, had the line removed. Despite this, no decolonization was prescribed for either patient that developed an infection. The second cycle showed that no patients developed a line infection post insertion.

Conclusions:

Compliance with decolonisation protocols is one of the most important measures that will reduce risk of hemodialysis catheter related infections. But there are still measures that need to be continuously implemented to ensure that we comply with 100% compliance.

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