432

The impact of nurse-led clinics in the management of patients with Cystinuria

Mrs Emily Cooper[1], Dr Graham Lipkin[1], Dr Lavanya Kamesh[1]
[1]*University Hospitals Birmingham Nhs Foundation Trust, Birmingham, United Kingdom*

Introduction:
Cystinuria is an autosomal recessive disorder that affects reabsorption of cystine in the proximal convoluted tubules and lead to renal calculi. Therapy to reduce stone formation is directed towards maintaining high fluid intake and alkalinisation of urine. Addition of cystine binding chelating compounds is reserved for recurrent stone formers for whom conservative therapies are insufficient. No curative treatment exists for this condition and patients quality of life can be affected due to lifelong risk of stone formation, multiple operative procedures and impaired renal function. This often leads to poor concordance. We present our experience of specialist nurse-led monitoring clinics that focus on patient education and safe monitoring of patients when chelating agents are used.

Methods:
We retrospectively reviewed the data of all patients with cystinuria attending the renal metabolic clinic (n=37). Patient demographics, renal function, stone burden, number of interventions and urine cysteine levels were noted. In addition, the side effects of the medications were also recorded. All patients attending the monitoring clinic were given advice on high fluid intake. Urinary alkalinisation (pH 7-7.5) was achieved with the use of potassium citrate or sodium bicarbonate.

Results:
18 of 37 patients were male (age 17-68 years) and had a follow up between 6 months to 10 years. Renal function, as measured by eGFR was decreased to <30mls/min in 2 patients. Majority of the patients (n=33) used potassium citrate and the rest used sodium bicarbonate (n=3) for urinary alkalinisation.
Fifteen patients used chelating agents (D-penicillamine n=13; Tiopronin=2). These drugs were generally well-tolerated. Only 1 patient could not tolerate either of the chelating agents due to gastro-intestinal side effects. The side effect profile included skin rash (n=1) and proteinuria (n=1) which settled with conversion from D-penicillamine to Tiopronin. The hematalogical and liver parameters checked in the monitoring clinic were stable. In this group of patients on chelating agents, the urinary cysteine levels reduced to solubility range in 11/15 patients (73%) and the overall mean number of surgical procedures/patient/year was 0.33.

Conclusion:
Nurse-led clinics for patients with cystinuria allow patient education and safe monitoring for chelating agents. It encourages compliance and could potentially reduce morbidity related to recurrent stone formation. Chelating agents are well-tolerated and reduce the risk of stone formation.

433

Characterisation of haemodynamic responses to haemodialysis using frequency analysis of continuous blood pressure measurements

Dr V R Latha Gullapudi[1,3,4], Professor Jill Stewart[2], Kelly White[4], T Walker[2], Tarek Eldehni[4], Professor Paul Stewart[2], Professor Maarten W Taal[3,4], Dr Nicholas M Selby[3,4]

[1]Sheffield Teaching Hospitals Nhs Foundation Trust, Sheffield, United Kingdom, [2]University of Derby, , United Kingdom, [3]University of Nottingham, , United Kingdom, [4]University Hospitals of Derby and Burton NHS Foundation Trust, , United Kingdom

INTRODUCTION

Intradialytic haemodynamic instability remains a significant problem, leading to ischaemic end-organ damage. Extrema points (EP) frequency analysis of blood pressure (BP) is a method of assessing beat to beat variation in BP, which may have relevance to end-organ perfusion. Our aim was to utilise this method to describe the patterns of individual cardiovascular response to haemodialysis (HD), study its variability and identify factors associated with higher BP frequencies.

METHODS

50 participants aged >18 years receiving in-centre HD were recruited. Participants had continuous non-invasive monitoring of BP and haemodynamics using pulse wave analysis (Finapres NOVA). Data were analysed by identifying the frequency and amplitude of local EPs (maxima and minima) for mean arterial pressure (MAP) as previously described. As higher EP frequencies have been shown previously to associate with ischaemic injury in the brain, we hypothesised that a ratio of high (HFC) to low (LFC) EP frequency values would characterise patients' risk of end-organ hypoperfusion during HD. We defined HFC as EP frequencies that were occurring within the same frequency range as heart rate and LFC as those occurring in frequency range of ≥3 cardiac cycles. Participants were then divided into 2 groups: Group 1 had a higher proportion of low EP frequencies (HFC/LFC ratio ≤0.5, n=21) and Group 2 a higher proportion of high EP frequencies (HFC/LFC ratio >0.5, n=22).

RESULTS

In total, 43 participants completed all three dialysis sessions with continuous haemodynamic monitoring. 61% were males, mean age was 62.3±16yrs, 43% had diabetes and 26 (59.1%) were on at least one antihypertensive medication. Median Charlson comorbidity score was 6 (IQR 4).

Median EP MAP frequencies of mid-week HD session was 0.54 Hz (IQR: 0.18) and correlated with dialysis vintage (r=0.315, p=0.039), NT pro-BNP levels (r=0.318, p=0.038), baseline baroreflex sensitivity (r=0.316, p=0.039) and average real variability (ARV, the average of the absolute change in the BP between consecutive measurements during the entire monitored duration) of SBP (r=0.334, P=0.029), ARV MAP (r=0.571, P=<0.0001) and ARV DBP (r=0.464, p=0.002).

Median HFC/LFC ratio was 0.517 (IQR: 0.42). In Group 1, there was trend towards gradual decline in HFC/LFC ratios during HD, whereas in Group 2 there was gradual rise (Figure 1). MAP was positively correlated with Cardiac Power Index (CPI) in each hour of dialysis, but not with total peripheral resistance index (TPRI) in group 1(Table 1, Figure 2a and 2b). In contrast, in Group 2, MAP correlated with CPI in first

hour of dialysis only, however MAP did correlate with TPRI in each hour of dialysis (Table 1, Figure 2c and 2d).

CONCLUSIONS

We have utilised the previously described EP frequency analysis and developed the method further. HFC/LFC ratio distinguishes participants with different baseline characteristics and compensatory responses to the haemodynamic stress of dialysis, thus indicating that they may respond differently to the various interventions to prevent intradialytic hypotension (IDH). Further studies are required to evaluate the significance of HFC/LFC ratio on clinical outcomes and organ perfusion, whether it is modifiable and if this will allow personalised approaches to reduce IDH.

434

A Novel Approach to anaemia management in an advanced kidney care setting

Mrs Clare Morlidge[1], mrs charlotte mallindine[1], mrs sandra cruikshank[1]
[1]*East and North Herts NHS Trust, Stevenage, United Kingdom*

Introduction
We describe a change in the management of an anaemia service for non-dialysis patients in a tertiary referral centre situated in a district general hospital.
Method
Following the retirement of the anaemia nurse and the re-organisation of the advanced kidney care (AKC) nursing team, the management of anaemia was redesigned to become a multidisciplinary (MDT) service. Over a period of a few months the service was redesigned to involve AKC nurses, nephrologists and renal pharmacists in a more streamlined service.
All patients were contacted and informed of the new process for obtaining their erythropoietin stimulating agent (ESA). A new designated email and phone number were set up where patients are requested to contact the nursing staff when they are running low on medication, thus empowering them to be involved in their treatment. The nursing team ensure repeat blood tests are available and also accept referrals from the doctors in clinic for patients who require ESA or iron therapy. The independent prescribing pharmacists review patient's blood tests, discuss dose changes with patients, and prescribe medication which is dispensed in the hospital. The medication is distributed to the clinics for patients to collect whilst maintaining the cold chain and saving on delivery charges. Intravenous iron is given on the Renal Intervention and Treatment Area.
The nursing team educate the patients on how to administer their ESA injections and the importance of having regular blood tests to monitor therapy.
Results
Just over 200 patients are looked after via this MDT service. On average 20 prescriptions are dispensed each week and distributed for the nursing team to give to the patients in clinic. Patients now have their anaemia monitored every 6-8 weeks in a more robust process as prescriptions are only issued when recent blood tests are available.
Table 1.
The change in service was also predicted to save about £50,000 over a 12 month period, largely due to the reduction in the cost of delivery.
Discussion
This is a true MDT process which has had a positive financial effect on the trust whilst focusing on patient safety. Monitoring of haemoglobin and iron stores is a more robust process as it is now linked into supply and therefore patient safety has been paramount in the change.

436

Reducing Prevalence of Alkalosis and Improving Adherence to Bicarbonate Targets Amongst Haemodialysis Patients Through the Use of Reduced Dialysate Bicarbonate

Dr Caroline Tulley[1], Dr Richard Hull[2], Dr Martin Ford[1]
[1]King's College Hospital, London, United Kingdom, [2]St George's Hospital, Tooting, London, United Kingdom

Background and Aims:

There is evidence that metabolic alkalosis in haemodialysis patients is harmful. An association has been demonstrated between extremes of bicarbonate and clinical outcomes, with significantly increased risk of mortality and hospitalisation with pre-dialysis serum bicarbonate >27mmol/L and <17mmol/L. However, no overall increased mortality risk was observed with moderate pre-dialysis acidosis (serum bicarbonate 19.1-23.0mmol/L).

2015 Renal Registry Data demonstrated 64.3% of haemodialysis patients overall had bicarbonates within target (18-24mmol/L) compared to 65.7% within our centre. Our reported mean pre-dialysis bicarbonate of 23.7mmol/L was above the mean serum bicarbonate 23.2mmol/L seen nationally. In addition, 33.7% of patients were alkalotic, with bicarbonates >24mmol/L. Given concerns of adverse patient outcomes with extremes of bicarbonate, we aimed to investigate whether reducing our dialysate bicarbonate would culminate in overall attainment of bicarbonate targets.

Method:

Mid-week pre-dialysis bicarbonate levels were measured from in centre haemodialysis patients once monthly, from May to August 2017, across 7 dialysis units within our renal service. Following this, in early 2018, we reduced dialysate bicarbonate concentration from 32mmol/L to 31mmol/L. Monthly midweek pre-dialysis bicarbonate levels were then re-measured in March and April 2019.

Results:

Initial analysis of 2103 pre-dialysis bicarbonate levels across May to August 2017 demonstrated median monthly bicarbonate levels of 24.0–25.0mmol/L. 40.7–54.2% (n=199-322) were alkalotic with pre-dialysis bicarbonates >24mmol/L across this period. Of note, 15-23% (n=66-120) had bicarbonate levels associated with increased mortality and hospitalisation (i.e. <17mmol/L or >27 mmol/L).

Subsequent analysis of 1070 bicarbonate levels in March and April 2019 demonstrated a reduction in median pre-dialysis bicarbonate to 22.0mmol/L. Similarly, the proportion of alkalotic patients fell to 11.9–15.3% (n=71-91). 5-9% (n=26-46) bicarbonates were <17 or >27mmol/L. In March 2019, 77.9% of patients had serum bicarbonates in target range compared to 65.7% reported in 2015 overall.

Conclusion:

Initial findings demonstrated substantial alkalosis amongst our dialysis population. A simple measure of altering dialysate by 1mmol/L achieved reductions in overall alkalaemia, and in turn, reduced the

percentage of patients with bicarbonate values theoretically correlating with increased mortality and hospitalization risk.

We have demonstrated that a small change in dialysate bicarbonate increased concordance with bicarbonate targets, without subsequent increased acidaemia. The extent to which adherence with such targets impacts on patient survival and morbidity remains an ongoing debate.

437

Designing a portable dialysis system - what is needed?

Dr Shailesh Agarwal[1], Dr James Fotheringham[1,2], Professor Martin Wilkie[1]
[1]Sheffield Teaching Hospitals NHS Trust, Sheffield, United Kingdom, [2]School of Health and Related Research, University of Sheffield, Sheffield, United Kingdom

Objectives
There is growing interest in developing portable systems for dialysis that rely on absorbents to remove toxins. Currently, most dialysis adequacy data focuses on urea clearance (KT/V) rather than total solute mass removed. Understanding the latter provides data that is more relevant for the design of such systems.

Methods
We reviewed data collected in the Peritoneal Dialysis Database for 439 people managed at a University Teaching Hospital from 30/04/1997 to 26/09/2019 as part of a quality improvement evaluation of regular clearance measurements. This includes 24 hour renal and peritoneal urea and creatinine removal, as well as ultrafiltration and urine volume. We then stratified the data according to demographics including age and sex.

Results
We had 1464 unique data sets. There was a median of 3 measurements per patient (range 1-25). 80th percentile peritoneal urea and creatinine removal among all patients was 166mmol and 4.89mmol respectively over 24 hours. This was higher in male (179mmol; 5.56mmol) compared to female (127mmol; 3.34mmol) patients. Urea and creatinine removal declined with age from 173mmol and 5.37mmol if aged less than 60 to 136mmol and 3.40mmol if aged more than 80 respectively. 80th percentile ultrafiltration was 798ml for all patients, 873ml for males, 700ml for females and it decreased from 812ml if aged less than 60 to 655ml if aged over 80. We did not have data on phosphate or sodium removal.

Conclusions
In order for novel technology to be of value to a standard peritoneal dialysis programme, we felt it would be necessary to cover at least 80% of a patient cohort. The data outlines solute and fluid mass removal values that are relevant when designing such portable systems for a typical UK peritoneal dialysis population. Noticeably, it would be easier to deliver a suitable system for women and older people.

438

Implementing an Access multidisciplinary team meetings to improve vascular access service – single centre experience from the UK.

Mrs Heidi Jimenez[1], Dr Jyoti Baharani[1]
[1]*Birmingham Heartlands Hospital part Of University Hospitals Birmingham Foundation Trust, Birmingham, United Kingdom*

Introduction:

Multidisciplinary team (MDT) meetings have been shown to be an effective tool to facilitate collaboration between professionals and improve care outcomes for patients. We put together a vascular access MDT at our centre in 2017. This incorporated case review and discussion at weekly team meetings which evolved practice to improve treatment recommendations based on evidence-based knowledge and expert opinion from the Vascular Surgeons, Interventional Radiologists, Nephrologists and Vascular access Clinical Nurse Specialists.

Methods:

The method of implementing the MDT meetings within our hospital had been in place since October 2017.
All aspects of vascular access were discussed at the MDT including radiological interventions, surgical peritoneal dialysis catheter insertions, review of the outcome post procedure and patients listed for or seen in the access clinic and surveillance clinic that had a complex medical history and those that required 'non-conventional' arterio-venous fistula surgery..
The access nurse specialists prepared the weekly MDT list which became part of the weekly clinical duties and was held every Wednesdays of the week. It was attended by the Vascular surgeons, Nephrologists, Interventional Radiologists and Clinical Nurse Specialists.

Results:

The number of cases put forward for discussion ranged from 830 to 855 over a 2year period. The discussions and outcomes were documented in the Access MDT book and electronically through a shared worklist. All the patients discussed were also documented in their own timeline through our system called Proton and the hospitals EPR system Concerto. Outcomes were appropriately communicated to the multidisciplinary team caring for that patient. The Access nurse specialists were responsible to follow up outcomes if needed and to provide follow up at the meeting the following week.

Discussion:

The implementation of the access MDT meetings has visibly improved the communication, coordination and decision making of our vascular access service. It has also improved the care process for patients with AVF's, AVG, PD catheters who have complex medical history. This has resulted in more efficient listings, fewer on-the-day cancellations and more structured referrals. Clinic times and outcomes have also improved because the cases have

already been discussed in the MDT meetings prior to consultation. We would recommend the weekly vascular access MDT as a worthwhile process that improves the quality of a dialysis patient's lifeline, improves efficiency and allows harmonisation of the surgical process.

439

Assessment of risk of post-operative acute kidney injury in a large unselected cohort of patients

Dr mahmoud montasser[1], professor chris farmer[1]
[1]*East Kent Hospitals University Foundation Trust, Canterbury, United Kingdom*

Aims

The incidence of AKI and its risk factors have been studied in surgical patients, but usually in selected high risk sub-groups such as cardiac surgery or emergency laparotomy which is not generalisable to the entire surgical populations. The use of routinely collected pre and peri-operative data has not been widely assessed in terms of its ability to predict post-operative AKI. This study aims to describe the incidence of acute kidney injury following surgical procedures performed under general anaesthesia in a general hospital setting and examine the association between American Society of Anaesthesiology physical status classification system (ASA) score and adverse outcome including acute kidney injury in a multivariable analysis.

Methods

One year observation cohort study in an unselected surgical population including all inpatient operations performed at a large general hospital in the United Kingdom. Patients were recruited between the calendar year 2010 and followed up for two years.

Results

AKI occurred in 6977 patients from a total of 44358 patients included in this study (15.7%). All analyses suggested a significant association between ASA score and development of AKI. Interestingly operation severity score was not associated with an increased risk of AKI or mortality. AKI occurring pre or post-surgery was associated with an increased mortality.

Conclusion

This study has demonstrated that ASA score is associated with an increased risk of post-operative acute kidney injury and death.

440

Identifying the unknown knowns: the utility of recording diagnoses electronically to identify individuals with polycystic kidney disease who had been previously discharged and may be suitable for tolvaptan

Dr Ismet Boral[1], Dr Matt Hall[1], Dr Mark Jesky[1]
[1]*Department of Renal Medicine, Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom*

INTRODUCTION
Until recently, management of individuals with autosomal dominant polycystic kidney disease (ADPKD) with estimated glomerular filtration rates (eGFR) greater than 30ml/min primarily focused on cardiovascular risk reduction, provision of information regarding the inheritance pattern of ADPKD and monitoring of renal function to identify progression. Consequentially many of these individuals were discharged back to primary care with guidance and triggers for rereferral to nephrology services.

Tolvaptan is a selective vasopressin antagonist which reduces cyst formation in ADPKD. Studies have shown its effectiveness to slow GFR decline and NICE recommends tolvaptan as an option for treating ADPKD.

Locally we have a dedicated tolvaptan clinic and have been successful in identifying and informing people with ADPKD under active renal follow up. However, we were aware there were people who were discharged who could miss the opportunity for a treatment shown to delay renal progression. We therefore performed a service evaluation to analyse available electronic records to identify people not on tolvaptan but who may benefit from it, with an aim to improve access to treatment and to facilitate informed patient choice.

METHODS
Renal diagnoses for all patients seen in the renal clinics within our department are routinely recorded on the eMED Renal electronic health records software (Mediqal HI, Stevenage, UK). A search was performed with the following inclusion criteria: documented ADPKD diagnosis; age 18-60 years; not on renal replacement therapy; eGFR 30-89ml/min; no previous tolvaptan use; and blood results available within the last 3 years.

Blood results, radiology and clinic letters were reviewed. Individuals were divided into two groups: previously discharged and ongoing renal follow up. Each group was further subdivided based on potential eligibility for tolvaptan. These were

1. Already offered and declined
2. Currently ineligible i.e. eGFR>89ml/min, no documented eGFR loss or small kidney size.
3. Could be eligible i.e. further blood tests are required if no recent results in 12 months or further imaging is required if none in the last 3 years.
4. Likely to eligible based on one of below: Documented loss of eGFR as drop >5ml/min over 12 months on 4+ measurements or >12.5ml/min over 5 years on 5+ measurements; Renal ultrasound/CT mean bipolar length >16.5cm; Total volume of kidneys >750ml on MRI.

RESULTS
Seventy-one patients were identified in the initial search, of which four were excluded, leaving 66 for further analysis (Figure 1). Twenty-one (31.8%) were likely to be eligible for tolvaptan and 25 (37.9%) could be eligible if more data (i.e. up-to-date investigations) were obtained. The majority of these individuals had been discharged from renal follow up.

CONCLUSIONS

This service evaluation has identified a number of individuals, the majority of who have been discharged from renal follow up, who may be suitable for tolvaptan. Furthermore, it has demonstrated the utility of recording renal diagnoses, particularly when new therapies are introduced which lead to changes in triggers for referrals back into renal services. Information is being disseminated to individuals and their GPs offering further renal input and an opportunity to discuss tolvaptan.

441

Assessment of physical activity in chronic hemodialysis patients in the nephrology and hemodialysis department CHU IBN ROCHD

Dr Imane Failal[1], Dr Sanae Ezzaki[1], pr Salma El khayat[1], Pr Ghizlane Medkouri[1], Pr benyounes ramdani[1]
[1]*Chu Ibn Roshd, Casablanca, Morocco*

Introduction:
Physical activity is often reduced in chronic hemodialysis patients. Studies having evaluated hemodialysis reveal a significant sedentary lifestyle. which is associated with excess mortality. Conversely, the benefits in terms of morbidity and mortality from physical activity are numerous. The fight against sedentary lifestyles in hemodialysis patients must be one of the objectives of healthcare teams. For this reason, our study aims to assess physical inactivity using a physical activity score from DIJON in chronic hemodialysis patients and to identify the factors linked to a decrease in physical activity in them and to propose programs aimed at to encourage PA as well as exercises adapted to the hemodialysis patient.
Materials and methods :
This is a descriptive and analytical cross-sectional study conducted during the month of January 2020, in the nephrology and hemodialysis department of CHU IBN ROCHD. We used the Dijon questionnaire translated into Arabic to measure the PA taking into account daily, sports or leisure activities. The PA level benchmarks are 0–10 (low), 10–20 (medium), and 20–30 (high).
Results:
Our study included 71 patients. The average age was 46.5 years with extremes ranging from 16 to 93 years, there is a slight male predominance with a sex ratio of 1.1. Initial nephropathy was undetermined nephropathy in 53.5%, glomerular in 29.5%, diabetic in 7% and hypertensive in 1.4%. The age of the periodic hemodialysis treatment in our patients varied from 1 month to 44 years, with an average duration of 17.3 years. 91.5% of patients had an arteriovenous fistula as a vascular approach, 8.4% of patients were dialyzed on a catheter.
The overall level of physical activity was high only in 4.5% of patients, while it was low in 61.3% and moderate in 34% of patients.
The study of the relationship between the decrease in physical activity and different demographic, clinical and paraclinical parameters had revealed that the decrease in physical activity was significantly correlated with seniority on hemodialysis, gender, l he advanced age, the different degrees of anemia, and the cardiovascular affections, on the other hand no significant correlation was found between the decrease in physical activity and hypocalcemia, hyperphosphatemia, and hyperparathyroidism.
Conclusion:
Our results show that the level of physical activity is linked to many parameters, some of which can be modified. Prescribing an adapted and personalized program would improve the prognosis related to co-morbidities and the quality of life of our patients.

442

Gram-negative bacteraemias in haemodialysis patients - pathogens and source identification. A 12 year single-centre experience

Dr Anna Naito[1], Dr Fatima Malik[1], Dr Christopher Cregg[1], Dr Lisa Bradwell[1], Dr David Makanjuola[1]
[1]*Epsom and St Helier University Hospitals NHS Trust, Carshalton, United Kingdom*

Introduction

Patients on haemodialysis (HD) are at a higher risk of infection. Gram-negative bacteraemias in HD patients are associated with significant morbidity and mortality (1). Efforts to reduce the rates of bacteraemias caused by Methicillin Resistant Staphylococcus Aureus (MRSA) have been hugely successful, falling by 57% since 2010 according to Public Health England (2). Epidemiological studies now show the re-emergence of gram-negative pathogens, particularly Escherichia Coli (E.Coli) in causing bloodstream infections (2,3). We aimed to determine the source and pathogens responsible for gram-negative bacteraemias in our HD cohort.

Methods

Data were collected from clinical records, renal unit electronic records, and the hospital's microbiology database of all confirmed bacteraemias in HD patients between 2007 and 2018.

Results

283 episodes of gram-negative bacteraemia occurred in 1361 patients over the 12-year period. 166 (58.7%) were male. The median age was 71 years (range 26-95). 90 (31.8%) had arteriovenous fistulae (AVF) or grafts, the remainder had dialysis lines in place, of which 41 (21.2%) had dual access, with the AVF or graft not yet in use.

The organisms isolated are shown in table 1. E.Coli and Klebsiella Pneumoniae were the dominant pathogens in the study population, accounting for 40.6% (n=115) and 15.9% (n=45) of bacteraemias isolated respectively.

The most common sources of infection were HD access related in 31.4% (n=89), urinary tract 18.4% (n=52), hepato-biliary 7.8% (n=22), chest 7.8% (n=22), gastro-intestinal 6.0% (n=17), skin/soft tissue in 4.9% (n=14) and other in 4.6% (n=13). The source was unknown in 50 (17.7%) and there was no information on 4 patients (1.5%).

Our data revealed that trends in E.Coli incidence were non-linear (see Figure 1). Incidence rates of E.Coli showed a steady increase from 2007-2009 (1.34%-1.59%). There was a significant drop in incidence in 2010 (0.58%), followed by an increase until 2012. Thereafter, rates dropped and have since plateaued.

Discussion/Conclusion

E.Coli bacteraemias remain a dominant cause of gram-negative bacteraemias in our HD population, accounting for the highest incidence rates every year. Dialysis lines are a significant risk factor for bacteraemia, lending further weight to the importance of establishing early definitive vascular access in

these patients. The urinary tract, hepato-biliary system, chest and gastro-intestinal tract were other identified sources of infection.

Most E.Coli bacteraemias are acquired in the community (2). Dialysis populations are exposed to both community and healthcare-associated infections. Recent resistance trends of gram-negative organisms are of particular and increasing concern (4) and therefore, robust surveillance systems that monitor pathogens and their anti-microbial sensitivity patterns are crucial. Our focus now is analysis of the changing sensitivity patterns of isolates and whether our local empiric antibiotic policy is contributing to selection pressures and anti-microbial resistance.

443

Renal revascularisation in patients with complete renal artery occlusion: a single centre experience

Dr Saif Al-Chalabi[1], Dr Áine Máire De Bhailis[1], Dr Rodrigo Hagemann[1], Dr Sara T Ibrahim[1], Dr Amy Hudson[1], Dr Edward Lake[2], Dr Constantina Chrysochou[1], Prof Philip A Kalra[1]
[1]Salford Royal Foundation Trust, Salford, United Kingdom, [2]Manchester Royal Infirmary , Manchester, United Kingdom

Introduction
Atheromatous renovascular disease is a common disease associated with hypertension, CKD and cardiovascular disease. It often follows an asymptomatic chronic course which may be undetected for years. However, acute kidney injury due to renal artery occlusion is an uncommon presentation requiring a high clinical index of suspicion for the prevention of irreversible renal damage. Here we describe 11 cases of renal artery occlusion involving 8 patients in our centre over a period of 12 years. The presentations, imaging, treatment and patient outcomes are described.

Methods
Hospital records were reviewed over the period from 2007 to 2019 and screened for keywords suggestive of acute renal artery occlusion (RAO). Data collected included demographics, comorbidities, renal chemistry, imaging findings, treatment and treatment outcomes.

Findings
11 episodes of RAO were identified in 8 patients. The mean age at presentation was 63 years. All interventions occurred at a single centre. 7 patients were smokers. All patients were hypertensive receiving an average of 4 anti-hypertensive agents. The median baseline eGFR was 49.5ml/min/1.73m^2.
7 of the episodes were acute presentations comprising of acute kidney injury with oligo-anuria, dyspnoea and uncontrolled hypertension. All patients required renal replacement therapy for management of volume status and they all underwent percutaneous intervention with unilateral stenting.
4 of the episodes were sub-acute presentations and came to the attention of the service through referral to the renovascular clinic. Most commonly these referrals originated in the general nephrology or cardiology clinics. These patients had hypertension but with a sub-acute drop in eGFR and recurrent admissions for acute dyspnoea. One patient required bilateral stents with the others requiring single unilateral stenting. All patients had a significant improvement in their renal function ranging from instant micturition post stenting to one who required renal replacement therapy for 6 months post intervention. The average number of anti-hypertensives reduced from 4 to 2 per patient post intervention. All patients were on an anti-platelet agent post intervention. 50% of the patients required a repeat intervention over a period ranging from 10 months to 60 months after initial intervention.

Conclusion
Acute RAO is an emergency which requires immediate treatment. However, it does require a high index of suspicion to preserve renal function. Treatment include anti-coagulation and thrombolysis/thrombectomy with renal artery stenting. Our case series highlights the importance of high clinical suspicion to identify suitable patients for revascularisation and ongoing close monitoring due to the high risk of recurrent RAO. Timely, revascularisation can restore independent renal function.

444

Professional Impact of Iterative Hemodialysis on Hemodialysed Patients at University Hospital IBN ROCHD

Dr Imane Failal[1], Dr Sanae Ezzaki[1], pr Salma El khayat[1], pr Ghizlane Medkouri[1], pr benyounes ramdani[1]
[1]*Chu Ibn Roshd, Casablanca, Morocco*

Introduction :
The treatment of workers with chronic renal insufficiency with repeated haemodialysis is marked by frequent temporary interruptions of work. These repeated interruptions result in lower earnings, particularly for the private sector. Despite its effectiveness, haemodialysis causes dysfunction in professional activities and poses the problem of keeping the patient active.
Purpose: To identify reintegration procedures and reasons for discontinuation in order to propose measures that contribute to the continued activity of workers treated with haemodialysis.
Materials and methods :
This is a prospective, descriptive study. It took place in January 2020 in the department of nephrology and haemodialysis CHU Ibn Rochd. The variables studied provided information on the socio-demographic and occupational characteristics of patients and on occupational changes after dialysis.
Results :
The study enrolled 71 haemodialysis; of which 36 men or 50.7% and 35 women or 49.29%; the average age of the study population is 46.5 years with extremes ranging from 16 to 93 years, the haemodialysis seniority was 17.3 years, Initial nephropathy was undetermined nephropathy in 53.5%, glomerular in 29.5%, diabetic in 7% and hypertensive in 1.4%.
As a result of this study, 54.7% of hemodialysed patients stopped working after dialysis began; and only 27% were able to continue working. However, 17.8% have never worked before in hemodialysis. 15% in the public sector, skilled workers 5%, unskilled workers 30%, farmer 7.5%, trader 25% and driver 10%. The duration between the start of hemodialysis and the loss of occupation is 14 months. Of those hemodialysed who stopped their profession, 30% had been laid off and 70% had voluntarily stopped their employment because of the constraints related to dialysis.
Discussion :
In the light of the foregoing, we suggest areas of improvement that could allow hemodialysis to maintain their professional activities:

• Promote early access to transplant, first-line treatment of end-stage renal failure, developing pre-emptive registration and transplantation, use of live donor transplants, etc.
• Provide flexibility in the organization of dialysis structures so that session schedules, in particular, can adapt to the needs and constraints of patients and not the other way around.
• Promote therapeutic modalities to maintain a professional activity (evening or night sessions, at home, according to patients' wishes) if possible by providing superior quality of treatment and better general condition (longer or more frequent sessions at adapted times).
• Promote therapeutic modalities to maintain a professional activity (evening or night sessions, at home, according to patients' wishes) if possible by providing superior quality of treatment and better general condition (longer or more frequent sessions at adapted times).
• To guarantee the availability of social workers in all structures, to advise and accompany patients systematically and very early and to help them to maintain their professional and social activities, if they wish and if their health permits.

• The issue of psychological support is also central, given the hardness and multiple consequences of kidney disease. It is essential that access to psychological support be offered, facilitated and generalised throughout the journey.
• Make occupational physicians aware of the specificities of kidney disease, including replacement treatments, to promote job retention and the implementation of adjustments if necessary.
• Raise awareness of kidney disease in the corporate world, to help patients recognize their difficulties, and to help them find or maintain their place in the labour market.

Conclusion :

These results confirm the destructive impact of WRI on the personal and professional lives of patients. It highlights the extent of the difficulties they encounter, in addition to medical problems, the constant adjustments to be made to their lives, the therapeutic choices to be made:
• socio-professional difficulties related to their health, the constraints of their treatment, or the misrepresentation of the IRT by the company and employers.
• psychological difficulties, directly related to the disease (acceptance of its chronicity, impact on self-image, marital problems, feeling of injustice, guilt, prohibitions self-formulated), or various previous unresolved issues that become invasive.

It shows how these difficulties weaken professional trajectories and frequently lead patients to economic instability and a partial or total loss of autonomy.

445

Higher rate of technique failure of non-fluoroscopic insertion of left IJV tesio lines and associated outcomes from a single centre experience

Dr Alanna Scally[1], Dr Richard Hoefield[1], Dr Sunil Daga[1]
[1]*Leeds Teaching Hospitals, Leeds, United Kingdom*

Introduction
UK Renal Association guidelines promote minimum standards of definite access use amongst individuals making planned HD starts (incident dialysis) at 60%. About 36% of incident dialysis patients have a tunneled dialysis line as their first access type. In our unit, the majority of tunneled dialysis lines are Tesio brand lines inserted into the internal jugular vein with ultrasound guided vein puncture and chest x-ray confirmation of line position after the procedure. The aim of this audit was to establish if left sided Tesio lines inserted without fluoroscopic guidance are more frequently malpositioned than right sided lines, requiring patients undergo further uncomfortable procedures and potentially delaying dialysis and prolonging inpatient stays.

Methods
We looked at the 50 most recent left sided Tesio lines inserted in our unit. We examined the notes and electronic medical record to identify the reason for left sided approach; if the line insertion was successful and correctly positioned; if no, what next action was taken; and if there was any delay in dialysis or discharge from hospital. We compared the above data against same dataset using the 25 most recent right sided Tesio line insertions to see if there was a difference.

Results
See table.

The 20 patients who required a repeat procedure waited for this for a mean of 3.65 days (median 1, range 0-20). It was not possible in all cases to quantify what delays in discharge and dialysis could be attributed solely to waiting for a repeat procedure as in many cases other medical issues were being addressed alongside dialysis access and in some patients alternative temporary dialysis access was placed. However in 5 patients it was possible to attribute 12 bed-days of delay in discharge. 3 patients were confirmed to have dialysis delayed by 1 day and 1 patient delayed starting dialysis by 8 days.

Discussion
In this group of patients non-fluoroscopic guided left sided Tesio lines were three times more likely to be malpositioned than right sided Tesio lines. The reason for this discrepancy is easily explained by the vascular anatomy. However, a right sided approach is not always possible. We recommend looking at the feasibility of fluoroscopy training for renal trainees. We also plan to look at the experience of other units and see if similar rates of malposition occur with different types of tunnelled line such as permcaths.

446

Screening and Risk Factors for Vascular Calcifications in Hemodialysed Patients

Dr Imane Failal[1], Dr Sanae Ezzaki[1], Pr Salma El khayat[1], Pr Ghizlane Medkouri[1], Pr benyounes ramdani[1]
[1]*Chu Ibn Roshd, Casablanca, Morocco*

Introduction :
Vascular calcifications (Cvs) are a significant risk factor for mortality during chronic kidney disease. It is therefore important to know the risk factors associated with their development. The purpose of this work was to determine the prevalence of Cvs in hemodialysis and to identify their risk factors.
Methods:
This is a cross-sectional CAA(calcification of the abdominal aorta); screening study in 40 chronic hemodialysed patients for more than six months who received an unprepared abdominal x-ray (AUP) profile, conducted in the nephrology and haemodialysis department of the CHU IBN ROCHD over a period of 3 months from November 2019 to January 2020.
Results:
There were 39 hemodialysed patients: 22 men and 17 women. The average age of our population was 43.7 years with extremes ranging from 16 to 72 years. The mean duration of hemodialysis was 12.5 years, the initial nephropathy was dominated by undetermined nephropathy. Caa were found in 37.5% of cases. Compared to the group without CAA, the majority of patients with CAA were male, older, and older in hemodialysis. No significant difference between the two groups in phosphocalcic balance, hemoglobin or CRP.
Discussion :
The results of our study demonstrate the high prevalence of hemodialysis CAA. Age and length of service in hemodialysis are independent risk factors. Although phosphocalcic parameters are not involved in our series, it is accepted that the use of low doses of calcium carbonate, vitamin D and the diet poor in dairy products, as well as the use of non-calcular phosphorus chelators could reduce the prevalence of these calcifications.
Conclusion :
The Unprepared Abdominal (AUP) is a simple and reproducible means of screening and tracking this complication in hemodialysis.

447

Prevalence of echocardiographic anomalies in hemodialysis at Chu Ibn Rochd

Dr Imane Failal[1], Dr Sanae Ezzaki[1], Pr Salma El khayat[1], Pr Ghizlane Medkouri[1], Pr benyounes ramdani[1]
[1]*Chu Ibn Roshd, Casablanca, Morocco*

Introduction:
Cardiovascular anomalies are frequent and often early, severe and masked in patients with renal impairment. These cardiovascular complications are the main causes of mortality and morbidity in hemodialysis patients, responsible for 11.65% to 58.57% of deaths during the first year. The clinical manifestations of these cardiovascular diseases are dominated by heart failure and sudden death. The diagnosis of these cardiovascular anomalies by cardiac ultrasound allows the individualization of patients at high cardiovascular risk.
The objective of this study to assess cardiovascular complications in chronic hemodialysis patients in the nephrology and hemodialysis department of the Ibn Rochd University Hospital.
Materials and methods :
Descriptive cross-sectional study with retrospective collection, having focused on 70 patients with chronic renal failure on dialysis, within the hemodialysis service of the IBN ROCHD CHU.
Results :
The records of 70 chronic hemodialysis patients were explored, the sex ratio was M/W 1.1 with a slight male predominance. The average age was 46.5 years with extremes ranging from 16 to 93 years. The initial nephropathy was an indeterminate nephropathy in 53.5%, glomerular in 29.5%, diabetic in 7% and hypertensive in 1.4%. The age of the periodic hemodialysis treatment in our patients varied from 1 month to 44 years, with an average duration of 17.3 years. 91.5% of patients had an arteriovenous fistula as a vascular approach, 8.4% of patients were dialysis on a catheter. A cardiac ultrasound was normal in 19% of hemodialysis patients. Echocardiographic abnormalities are dominated by valve lesions which represent 49.5%, followed by left ventricular enlargement (14.5%), then comes dilated cardiomyopathy (12%), And pulmonary hypertension represents only 3.8%.
Conclusion :
Echocardiography is a non-invasive, available and reproducible test that can accurately diagnose a heart defect. It is an essential tool in the care of the hemodialysis patient who dies every second time from a cardiac cause. Early detection and management of chronic renal failure can certainly prevent these complications

448

Knowledge, attitudes and perceptions of organ donation by students in medicine

Dr Imane Failal[1], Dr Sanae Ezzaki[1], Pr naoufal mtioui[1], Pr benyounes ramdani[1]
[1]*Chu Ibn Roshd, Casablanca, Morocco*

Introduction:
Organ transplantation is a treatment option to millions of patients worldwide. In this area, Morocco lags far behind the developed countries and even compared to some countries in the Arab world.
The objective of this study is to assess the knowledge; social attitudes and perceptions of donation and organ transplantation by medical students.
Materials and methods :
This is a cross-sectional study descriptive and analytical target held in the Faculty of Medicine and Pharmacy of.
Results:
320 medical students were surveyed. The mean age was 21.5 ± 2.32 years, with a female representing 78%. Almost all surveyed students knew the lethal diseases requiring the use of the graft (99.8%) and 97% of them knew the transplantable organs. 92% had heard of the possibility of organ transplants in Morocco, 90% of students felt that there are many people in need of transplants
87% of students were aware of the existence of legislation governing organ donation in Morocco. Only 7% thought that acts of donation and transplantation of organs are performed in private clinics, 89% of respondents know that there is a book in which one can register to make known its agreement to give its organs after death, 81% do not know the steps to register for this registre.97% were for organ donation and causes of refusal were: religion and the attainment of bodily integrity
Conclusion:
There has to be targeted actions in order to promote donation and transplant in Morocco in order to enhance knowledge and information on medical, religious and legal order that the attitudes and perceptions of the population live.

449

Single unit experience of nurse led monthly quality assurance reviews on a haemodialysis unit

Mrs Nicola Clewes[1], Mrs Kate Anderson[1], Mrs Mandy Plant[1], Dr Veena Reddy[1]
[1]*Sheffield Kidney Institute, Sheffield, United Kingdom*

Introduction

It is standard practice for unit haemodialysis patients in the UK to have their dialysis treatment reviewed, usually on a monthly basis in dialysis quality assurance (QA) meetings. Dialysis parameters reviewed at such meetings include, renal anaemia, bone profile, blood pressure, vascular access and dialysis solute clearance. In many units in the UK, these meetings are traditionally led by a nephrologist, together with a dialysis staff nurse and possibly a dietician and pharmacist. In our unit consisting of 136 patients, we were holding such meetings on a weekly basis, reviewing approximately one quarter of patients at each meeting. We undertook a trial of nurse led monthly QA meetings.

Method

Haemodialysis quality assurance flow charts were developed for management of anaemia, bone profile (calcium, phosphate, parathyroid hormone (PTH), blood pressure, vascular access monitoring and dialysis adequacy by a nephrologist responsible for managing haemodialysis patients. Two senior dialysis sisters, both with non-medical prescriber qualifications attended regular HD QA meetings with the lead nephrologist for several months on the dialysis unit. With close supervision, the dialysis sisters then trialled reviewing dialysis parameters and monthly blood results and making independent decisions on changes to medications and dialysis prescriptions where required, with direct supervision from the nephrologist. When both dialysis staff felt confident in their decision making, we trialled conducting the monthly QA meetings led by the 2 sisters for 2 months, followed by the nephrologist month 3 and again the dialysis sisters months 4 and 5. Any concerns or questions about results and treatment changes that the nurses did not feel confident to make, they discussed with the nephrologist. We compared the dialysis parameters for the 5 months before and 5 months during the time period of the trial.

Results

The dialysis sisters successfully completed 4 months of HD QA meetings. There was no difference noted between haemoglobin, corrected calcium, phosphate, parathyroid hormone, predialysis blood pressure or dialysis adequacy measured by single pool Kt/V in the 5 months before the trial period and 5 months during the trial period (Table 1). Both staff members felt increasingly confident with their decision making with time and enjoyed the opportunity to do so. Concerns with dialysis access seemed to be identified in a more timely manner when the nursing staff were undertaking the QA meetings. During the 4 months whilst the nurses were leading the QA meetings, the unit nephrologists reviewed an increased number of patients compared to the 4 months prior to the trial.

Discussion

This was a successful trial of nurse led monthly QA reviews on our dialysis unit. The nursing staff involved felt their knowledge relating to management of dialysis patients increased during the trial period and they felt more empowered and confident in independent decision making. The HD dialysis parameters were managed as effectively as they had been by the nephrology team. The nurse led QA reviews enabled the nephrologists to spend more time reviewing dialysis patients on the unit.

451

Identifying stable patients suitable for primary care follow-up in a large non-dialysis CKD cohort.

Miss Sophia Mohammed[1], Professor Philip Kalra, Dr Rajkumar Chinnadurai, Dr Ibrahim Ali
[1]University Of Manchester, Manchester , United Kingdom, [2]Salford Royal NHS Foundation Trust, Salford, United Kindgom, [3]Salford Royal NHS Foundation Trust, Salford, United Kindgom, [4]Salford Royal NHS Foundation Trust, Salford, United Kindgom

Identifying stable patients suitable for primary care follow-up in a large non-dialysis CKD cohort.

Background and Aims:
Chronic kidney disease (CKD) is a growing public health concern, affecting approximately 13.4% of the global adult population. Due to the rising burden of CKD and its economic cost, there is a pressing need to identify the risk factors which can predict CKD progression and thereby enable management of more stable patients in the community under primary care follow-up. Our study aimed to identify specific factors that are associated with stable CKD

Method:

The study was conducted on patients recruited into the Salford Kidney Study, a large prospective CKD cohort recruiting patients since 2002. From a total of 2952 recruited between 2002 and 2016, 1004 patients with a diagnosis of hypertension, diabetic kidney disease or pyelonephritis were sampled for this study. Patients with primary renal diagnoses of glomerulonephritis and polycystic kidney disease were excluded as these would usually require long term follow up via a nephrology clinic. Based on the annual rate of progression of estimated glomerular filtration rate (delta eGFR), 140 patients were identified as stable CKD patients (delta eGFR between -0.50 and 0.50 ml/min/1.73m²/year). The characteristics of this group was compared with 277 rapid progressors (RP) (delta eGFR < -3.00 ml/min/1.73m²/year). Baseline characteristics, comorbidities, laboratory results and outcomes were compared for all three groups.

The Mann-Whitney U test was used to assess statistical significance between fast progressors and stable CKD. Negative predictive value analysis was performed on all 1004 patients with an outcome of a GFR < 30ml/min/1.73m².

Results:
62.7% of patients were male, and the median age was 69 years. Stable CKD patients had a significantly higher age compared to RP (69 vs 62 years, p=0.001) and comparatively lower median blood pressure (137 vs 141.5 mm of Hg, p=0.001). Other risk factors for rapid progression included history of diabetes (p=0.021), lower albumin (41 vs 44 g/l, p<0.001), raised urine protein : creatinine ratio (154.6 vs 18.8 mg/mmol , p<0.001) and higher phosphate (1.24 vs 1.12 mmol/l, p<0.001) (Table-1). Far more rapid progressors reached ESRD (172 vs 18 stable patients, p<0.001) but there was no significant difference in mortality (93 vs 55 patients, p=0.25). Characteristics that were statistically different for stable CKD patients were: age, systolic blood pressure, diastolic blood pressure, diabetes, albumin, UPCR, and phosphate. NPV analysis did not identify any clear predictors of stable CKD patients.

Conclusion:
Several factors differed between stable and rapid CKD patients. However, no reliable predictors of a stable outcome were determined by NPV analysis. Further risk prediction models incorporating biomarkers are

warranted to identify factors that can confidently guide prognosis such that stable CKD patients can be managed in the community.

452

Prognostic Significance of Erythropoiesis-Stimulating Agent Dose Requirements in PIVOTAL and its Implications for the Potential Mechanisms of IV Iron Benefit in Maintenance Haemodialysis Patients

Dr Benjamin Oliveira[1,2], Dr Mohamad Barakat[1,3], Mrs Michele Robertson[4], Professor Ian Ford[4], Professor Iain Macdougall[2], Dr Darlington O Okonko[1,3]

[1]School of Cardiovascular Medicine and Sciences, King's College London, London, United Kingdom, [2]Department of Renal Medicine, King's College Hospital, London, United Kingdom, [3]Department of Cardiology, King's College Hospital, London, United Kingdom, [4]Robertson Centre for Biostatistics, University of Glasgow, Glasgow, United Kingdom

Background

PIVOTAL (Proactive IV Iron Therapy in Haemodialysis Patients trial) has shown that high-dose iron given proactively is superior to a low-dose reactive strategy with respect to the primary end-point of all-cause mortality (ACM) or nonfatal myocardial infarction, stroke, or heart failure hospitalisation. The underlying mechanism(s) remain unclear. Whilst attenuations in erythropoiesis-stimulating agent (ESA) dose requirements might explain the results, it has yet to be determined whether temporal ESA doses related to PIVOTAL outcomes. Moreover, whether the benefits of high-dose iron could have arisen via mechanisms unrelated to ESAs and erythropoiesis, such as mitochondrial augmentation, is unknown. We hypothesised that lower monthly ESA doses would relate to better PIVOTAL outcomes, but that higher iron doses would still associate with better outcomes even after accounting for ESA doses or haemoglobin (Hb) levels.

Methods

We undertook a post-hoc analysis using the entire PIVOTAL cohort (n=2141, mean±SD age 63±15yrs, 65% male). Univariable then multivariable stepwise linear regression assessed intervariable relations. Cox proportional hazards survival analyses were conducted with monthly ESA doses, iron doses, or Hb levels as time-varying covariates. The relation between ESA dose and outcome was depicted with restricted cubic spline plots.

Results

Median[IQR] standardised ESA dose at baseline was similar in the proactive (8000[5000, 10000] IU/week) and reactive (8000[5000, 12000] IU/week) arms with higher doses related to higher C-reactive protein, body mass index, phosphate binder use, dialysis via a graft, and lack of hypertension (all P<0.05). Over a median follow-up of 24[10, 33] months, proactive patients had lower median (25,980[17320, 43300] vs. 34,640[25980, 56290] IU/month) and cumulative (63,2180[259800, 1163471] vs. 76,2080[329080, 1437560] IU, Fig A) ESA doses, higher cumulative iron doses (5900[3400, 8200] vs. 3400[1500, 5200]mg), and ΔTSAT (6[-1, 13] vs 0[-5, 7]%). Hb levels increased more rapidly in proactive patients. Greater ESA dose reductions correlated to greater increases in albumin, higher cumulative iron doses, and lower blood transfusion needs (all P<0.05) after adjustment for treatment assignment. Primary end-point and ACM events occurred in 658(31%) and 515(24%) patients. In the total population, monthly ESA dose (per 100,000 IU; HR 1.007, P=0.04), monthly iron dose (per 100mg; HR 0.79, P<0.0001), age (HR 1.03, P<0.0001), and diabetes (HR 1.84, P<0.0001) independently predicted the primary end-point. Median monthly ESA dose was also prognostic despite adjustment for median monthly iron dose, with doses below the median (34,640 IU/month) linked to better outcomes (Fig B, C). For ACM, monthly ESA dose (per 100,000 IU; HR 1.008, P=0.02), monthly iron dose (per 100mg; HR 0.83, P<0.0001), age (HR 1.04, P<0.0001), and diabetes (HR 1.63, P<0.0001) were

independently predictive. In separate Cox models, monthly iron dose remained predictive of the primary end-point and ACM after adjustment for monthly Hb, age, and diabetes.

Conclusion

Decreased ESA requirements are associated with better outcomes in PIVOTAL, but higher iron doses remained protective even after accounting for monthly ESA doses or Hb levels. This suggests that mechanisms beyond ESA dosing and erythropoiesis might have contributed to the benefits of iron.

455

Cocaine induced thrombotic microangiopathy with acute kidney injury, a rare presentation

Dr Muhammad Azam[1], Dr Ingi Elsayed[1], Dr Julie Wessels[1]
[1]*Renal Department University Hospital North Midlands, Stoke On Trent, United Kingdom*

Thrombotic microangiopathy (TMA) is a rare potentially life-threatening condition caused by small –vessel platelet microthrombi. The primary TMA Syndromes include thrombotic thrombocytopenia purpura (TTP), Shiga toxin mediated haemolytic uremic syndrome (STEC-HUS), drug induced TMA(DITMA) and complement mediated TMA. Clinical features include microangiopathic haemolytic anaemia and thrombocytopenia, and may have acute kidney injury, neurological abnormalities and cardiac ischemia. Drug induced TMA is either immune mediated or non-immune mediated and cocaine use is associated with non-immune DITMA (rarely reported).

We present a case of 29-year-old male with PMH of HTN and T2DM who presented in September 2019; with features of microangiopathic haemolytic anaemia, thrombocytopenia and acute kidney injury (thrombotic microangiopathy). On direct questioning on admission; the patient denied the use of any recreational drugs. His symptoms were abdominal, chest pain and witnessed collapses at home. His admission blood results, immunology screen and radiology results are shown in Table 1. His presentation was initially suggestive of TTP; hence treatment was started comprising of plasma exchange and acute hemodialysis as; he was oligo-anuric. The following day; his level of consciousness altered where his Glasgow Coma Scale (GCS) was 7/15; He got transferred to intensive care unit (ICU); where he needed intubation, mechanical ventilation (MV) under minimal sedation and cardiovascular support (CVS) in the form of inotropes; to support his airway, breathing and circulation. An emergency CT head showed multiple infarctions.

While he was on ICU, he continued to receive of plasma exchange. Newcastle Complement Centre was contacted and they recommended starting IV Eculizumab; pending further results. Toxin mediated HUS (E.coli O157) was excluded; with samples submitted to PHE Colindale Bacteriology were found to be negative. His ADAMTS13; was normal. Complement mediated TMA was investigated for at Newcastle (immunologic and genetic evaluation were conducted) and these results came back negative; by then he had received two doses of Eculizumab. In collaboration with the team in Newcastle; the decision was made to halt further Eculizumab & further plasma exchange. Further corroboration was sought from the patient and his family; which revealed that he had used cocaine recreationally prior to admission. Saved toxicology samples from admission, tested positive for cocaine. We believe that this a case of non-immune DITMA.

This patient's hospital stay was turbulent; where he required two further admissions to ICU; as he had developed apnoeic episodes (associated with multiple infarctions); requiring MV and CVS support. He further needed a percutaneous tracheostomy and gradual weaning of MV. He remained dialysis dependent throughout. It was felt that performing a native renal biopsy; while on ICU, inappropriately risky; particularly; as it would not have changed his management at that point. This patient remains dialysis dependent. He currently continuing to receive neurological rehabilitation inpatient; where he has resumed independent oral intake and enjoys conversing with family.

To summarize, cocaine use is associated with thrombotic microangiopathy although rarely reported and admitting physician need to be alert of this possibility.

456

Acute renal failure following poisoning by juniper tar (cade oil)

Dr Imane Failal[1], Dr Sanae Ezzaki[1], Pr benyounes ramdani[1]
[1]*Chu Ibn Roshd, Casablanca, Morocco*

Introduction:
Juniper tar "Cade oil" is distilled from the branches of Juniperus oxycedrus. Despite its known toxicity and which is linked to its phenol content, this oil continues to be used in traditional medicine. The toxicity of phenol affects a wide variety of systems, such as the central and peripheral nervous systems, the cardiovascular, hepatic and biliary systems, the skin and the respiratory tract.
Materials and methods :
We report the case of severe systemic toxicity after local administration of cade oil in an infant. This clinical case shows that the use of products can expose to a risk of poisoning confirming that the skin of the newborn can absorb various molecules with serious accidents.
Observation:
This is a 12-month-old infant; the youngest of a chip shop of three, from a well-followed pregnancy, a vaginal delivery, well vaccinated according to the national immunization program, with no pathological history individuals. Hospitalized in the pediatric resuscitation department for respiratory and neurological distress following poisoning with cade oil, applied locally to the wrists, elbows forehead and head. The application was thick and extensive. Half an hour later, the infant developed respiratory distress, hypotonia and convulsions without fever. On physical examination, the infant was unconscious, 75% desaturated under a high concentration mask with an impregnable blood pressure requiring intubation. The biological investigations revealed a renal insufficiency in 52mg / l of creatinine plasma with a rate of urea to 3.5 g / l, a rate of potassium and sodium correct; metabolic acidosis (pH = 7.28; HCO3 = 16 mmol / l and PCO2 at 32 mm Hg), absence of hepatic cytolysis, and all other laboratory tests were normal.
The treatment was mainly based on rapid and complete skin decontamination with soap and water to reduce the skin absorption of oil. In addition, symptomatic treatment based on mechanical ventilation, hemodynamic correction, basic acid disorders, and rehydration.
Result and follow-up
The evolution was favorable, the infant was extubated on D10 of his hospitalization, with a progressive recovery of the renal function under rehydration which passed from 52mg / l of plasma creatinine to 5.6mg / l.
The follow-up after 6 months was remarkable, and the neurological and psychomotor developments were normal.
Conclusion:
Juniper tar (cade oil) is one of the most used essential oils in traditional Moroccan medicine. Several cases of intoxication have been described in the literature.

457

Acute renal failure: epidemiological, etiological, therapeutic and progressive profile

Dr Imane Failal[1], Dr Sanae Ezzaki[1], pr benyounes ramdani[1]
[1]*Chu Ibn Roshd, Casablanca, Morocco*

Introduction :
Acute renal failure (AKI) is a frequent pathology responsible for a heavy morbi mortality both immediate and long term. The mortality rate varies a lot depending on the terrain; associated pathologies, and the context in which ARI occurs. The prognosis depends on the initial etiology and early management, made possible by advances in current methods of adrenal support.
Objective: determine the frequency of AKI in each department, the clinical, biological and progressive characteristics of patients with AKI, the modalities of management of AKI and the evolution (recovery, evolution towards IRCT, death)
Materials and methods :
This is a retrospective case study carried out in the nephrology department of the Ibn Rochd University Hospital in Casablanca, during the period from January 1, 2018 to December 31, 2019.
The patients who make up this series have been admitted to the various emergency, resuscitation, medical and surgical departments of the CHU.
Results:
Our study included 456 cases, The annual incidence was 229 cases / year, with an average age of 45.8 ± 18 in adults and 7.5 ± 4.35 years in children. A male predominance with a sex M / F ratio of 1.2. The most common history in our patients was diabetes and hypertension. Our patients have been hospitalized in the various medical and surgical resuscitation departments and the emergency department, which is the main hospitalization site for our patients. Followed by the medical vacation service and then the surgical services. Treatment for AKI was based on extrarenal purification in 340 patients (67.19%) indicated mainly in the face of threatening hyperkalemia, disturbances of consciousness
The evolution was marked by an improvement in renal function in 61.35% of the patients, death in 36.2% and by an evolution towards the terminal stage in 3%. In the analytical study, the evolution of renal function was significantly associated with the etiology of AKI, the unstable state of the patient, the creatinine values and the number of hemodialysis sessions. The significant risk factors for mortality were, AKI and sepsis, hemodynamic instability, at the time between admission and dialysis
Conclusion:
Despite the multiple current consensus to define IRA, it remains a research subject both on the pathophysiological and therapeutic level, a better knowledge of risk and prognostic factors could be a major asset for more effective management.

462

Autotransplantation of a solitary kidney for recurrent Renal Artery Stenosis in a patient with Zinner's syndrome

Dr Michelle Chong[1], Dr Rajkumar Chinnadurai[2], Mr Titus Augustine[2], Dr Mark Brady[1]
[1]Department of Renal Medicine, Lancashire Teaching Hospital Foundation Trust, Preston, United Kingdom, [2]Department of Renal Transplantation, Manchester Royal Infirmary, Manchester , United Kingdom

Renal artery stenosis (RAS) is defined by narrowing of the renal arteries which is primarily caused by atherosclerotic disease or fibromuscular dysplasia. Current ESC and AHA guidelines, recommend medical therapy to optimise blood pressure control as primary management. Where medical management does not lead to acceptable clinical status or fails to halt progression of stenosis; endovascular revascularisation is routinely considered as a treatment option. Such patients are at a risk of developing in-stent stenosis which rarely can become recurrent. Neither of these guidelines discuss the prospects of definitive revascularisation via renal autotransplantation as a treatment option; reflecting how infrequently this technique is utilised.

We present an interesting and complex case of severe recurrent RAS in a 47 year old male patient with a solitary right kidney due to ipsilateral agenesis; in relation to a congenital seminal vesicle cyst and unexplained early onset atherosclerotic vascular disease. He had severe resistant hypertension uncontrolled on multiple (7) antihypertensive medications. He first underwent angioplasty and stenting to the right renal artery aged 37 years in 2005. Despite being on dual anti-platelet therapy, he developed recurrent episodes of in-stent stenosis requiring repeated angioplasty and stent insertions up to 2015 (9 episodes). His serum creatinine remained within the normal range throughout. However the time interval between recurrent in-stent stenosis was shortening, leading to concerns of complete occlusion or major complications during interventional procedures. The patient was aware that sudden occlusion could lead to established renal disease requiring replacement therapy and was therefore counselled by our Kidney Choices team. This was in addition to risks from persistent uncontrolled resistant hypertension. We considered all options and referred to a renal transplant surgeon for elective renal autotransplantation. Autotransplantation in a solitary kidney can be more challenging with little room for error, with the risk of patient ending up on dialysis in the event of technical failure. The proposed procedure involved nephrectomy, excision of stenosis which is complicated by an in-situ stent and reconstruction with an internal iliac artery graft. An open nephrectomy approach was used in this case due to the presence of the endoluminal stent in the renal artery.

Thankfully he underwent successful renal autotransplantation in 2016. He required HDU post-operatively owing to Hospital Acquired pneumonia. He was discharged on bisoprolol alone to manage palpitations with no anti-hypertensives for blood pressure control. His renal function remains normal to date and no additional blood pressure control has been required. This case supports elective renal autotransplantation as a potentially viable and beneficial option in management of patients suffering from complex cases of renal artery stenosis.

463

Mineralocorticoid receptor blockade preserves the glomerular endothelial glycocalyx and normalises glomerular albumin permeability in diabetic nephropathy

Michael Crompton[1], Matthew J Butler[1], Joanne K Ferguson[1], Raina D Ramnath[1], Anna S Ogier[1], Karen L Onions[1], Gavin I Welsh[1], Rebecca R Foster[1], Simon C Satchell[1]

[1]*Bristol Renal, Bristol Heart Institute, Translational Health Science, University of Bristol, Bristol, United Kingdom*

Introduction: The glomerular endothelial cell (GEnC) glycocalyx, a luminal proteoglycan layer, forms the first part of the glomerular filtration barrier. In diabetic nephropathy, damage to the GEnC glycocalyx is an important contributor to the pathogenesis of albuminuria. Mineralocorticoid-receptor (MR) antagonists limit activation of the receptor by aldosterone and slow disease progression, but side effects, including hyperkalemia, limit their clinical use. Diabetes is not associated with elevated aldosterone levels, suggesting the possibility of MR activation by aldosterone-independent mechanisms. Cortisol can also activate MR but the cytosolic enzymes 11-β-hydroxysteroid dehydrogenase type-1 and type-2 (11-β-HSD1 and 11-β-HSD2) modulate cortisol availability. In GEnC, 11-β-HSD2 is normally present and catalyses the conversion of cortisol to the inactive metabolite cortisone preventing it from activating MR.

Methods: To induce type 1 diabetes, male Wistar rats were injected with streptozotocin (STZ, 50 mg/kg), whilst controls received citrate buffer. Blood glucose levels greater than 15 mmol/L confirmed diabetes. At 4 weeks diabetic rats were randomised to receive 50 mg/kg spironolactone (an MR antagonist), or vehicle, via daily subcutaneous injection. Rats were culled after 21 days treatment.

Results: Diabetic rats became significantly albuminuric 4 weeks post-STZ, and this persisted with a 6.9-fold increase in albuminuria at week 8. Direct measurement in isolated glomeruli demonstrated a 1.6-fold increase in glomerular albumin permeability. Peak-to-peak measurement of Marasmius oreades agglutinin (MOA) and wheat germ agglutinin (WGA) lectin labelling of the glycocalyx, an index of glycocalyx thickness, demonstrated a significant reduction in GEnC glycocalyx depth in diabetic rats (MOA, -1.4-fold; WGA, -1.5-fold). MR blockade in diabetic rats reduced both the development of albuminuria and the increased glomerular albumin permeability to control values. Diabetic rats treated with spironolactone had significantly thicker glycocalyx than untreated diabetic rats (MOA, 1.6-fold; WGA, 1.4-fold). In contrast, the depth of the GEnC glycocalyx in spironolactone treated diabetic rats was not statistically different from controls. Enzymatic degradation, with hyaluronidase, confirmed that the improvement in albuminuria with MR blockade is dependent on glycocalyx restoration. Glomerular gene expression of Mmp2, Mmp9, Hsd11b1 and Hsd11b2 were analysed. In diabetic rats treated with spironolactone, expression of Mmp2 mRNA was significantly reduced suggesting a mechanism of glycocalyx protection. In both treated and untreated diabetic rats, the Hsd11b1:Hsd11b2 ratio was significantly increased compared to controls, indicating a means whereby intracellular cortisol levels may be raised leading to MR activation.

Conclusions: MR blockade with spironolactone preserves the GEnC glycocalyx, reduces the increased glomerular permeability and retards the development of albuminuria in diabetic nephropathy. Alternative approaches to block MR-induced glycocalyx damage warrant further investigation as a therapeutic strategy in diabetic nephropathy, to reproduce the benefit of MR antagonists without the adverse effects.

466

Case report - donor derived allergy

Dr Madhu Mati Shahani[1], Dr Ranmith Perera[1], Dr David Game[1]
[1]*Guys And St Thomas Hospital, London, United Kingdom*

For successful organ transplantation, immunosuppressive drugs are administered to suppress cells of the immune cell, primarily T and B lymphocytes. Consequently, some of the same drugs applied in transplantation medicine are used in severe allergic diseases as well. Therefore, one would expect that transplant recipients would not show clinical signs of type I allergy and do not develop any kind of sensitization or clinical symptoms of allergy because the IgE pathway is being suppressed.
We present a case which we suggest is the first report of donor derived drug allergy in solid organ transplantation. A 37yr old man developed ESRD secondary to Alport's COL4A5 mutation. He was started on CAPD in 2002 and then received his first transplant in 2004. This failed in 2009, he was restarted on haemodialysis with graft nephrectomy soon after. Histology of the graft showed a well encapsulated (6mm) type 2 papillary renal carcinoma pT1a which was completely excised. He recently received his second transplant from a 20 year old DCD donor, MM 111 who died from bacterial meningitis. The donor was treated with ceftriaxone 3 days before death but developed a rash within 24 hours and switched to chloramphenicol and metronidazole; creatinine 90 at organ harvest. Our recipient received ceftriaxone starting in theatre and continued post transplant for 5 days. He developed no systemic reaction to the drug. Our patient had delayed graft function, had bleeding around the graft which required exploration in theatre on day 5 hence a renal biopsy was taken. The biopsy showed acute tubular injury but no tubulitis. There was granulomatous tubulointerstitial nephritis with diffuse mononuclear cell infiltrate and occasional eosinophils most prominent in the renal medulla; no evidence of rejection. The ceftriaxone was already stopped and he made a sustained recovery.
The most likely aetiology and mechanism was proposed as passive transfer of sensitized passenger cells from donor transplanted tissue. These cells are likely to be resident for a short time, hence donor derived drug allergy not being a major clinical problem. Other causes of granulomatous TIN such as infection, sarcoid and de-novo anti GBM disease were excluded. Donor derived food allergy has been commonly reported in solid organ transplants, particularly in paediatric liver. The factors explaining the failure of immunosuppressive therapy to prevent type I hypersensitivity in transplant recipients are not entirely clear.

468

Adjusted Donor Age – Validity and Influence on Deceased Donor Offer Decisions

Dr Christoph Mahler[1], Dr Emma Morganti[1], Dr Dhriti Dosani[1], Dr Anamika Adwaney[1], Mr Frank Dor[1], Dr Rupert Bright[1], Dr Damien Ashby[1]
[1]*Hammersmith Hospital, Imperial College Healthcare Trust, London, United Kingdom*

Background:
Although a number of donor factors are known to affect outcome following deceased donor kidney transplantation, many units have no clear criteria for acceptance. Existing donor scoring systems, such as KDRI, perform poorly in the modern comorbid donor pool, and are difficult for patients to understand. Adjusted Donor Age (ADA) is a patient-friendly scoring system in which donor age is modified according to the presence or absence of a number of risk factors, and categorised by ADA decade (using cut-offs at 50, 60, 70 and 80 years) into quintiles (A – E) representing increasing donor risk (A – C favourable, D marginal, and E unfavourable).
Methods:
All deceased-donor kidney offers at a single centre were analysed over a 3 month period (beginning after the September change in UK organ allocation) during which ADA was optionally available to clinicians at the time of considering the offer. The effect of ADA on acceptance decisions and outcome in those transplanted were analysed.
Results:
Out of 230 offers median(IQR) ADA was 67(56–76). Kidneys were transplanted in 24%, declined due to concern over donor risk in 44%, with recipient and other factors responsible for non-transplantation in 32%. In those identified as favourable by ADA (quintiles A – C, without exclusion factors), organs were rejected due to donor risk in 28/104 offers (27%), compared to 50/186 (27%) in the 2018 cohort. In those identified as unfavourable by ADA (quintile E) organs were transplanted in 0/38 offers (0%), compared to 10/66 (15%) in the 2018 cohort.
At 1 month post-transplantation (N=55, from quintiles A – D only, since no organs from quintile E were accepted) one recipient remained dialysis dependent (from quintile D). In those with functioning transplants (N=54) recipient GFR was strongly correlated with ADA (R=0.52, $p<0.001$) and was seen to reduce across quintiles A – D (74, 55, 43 and 38ml/min/1.72m2).
Conclusion:
ADA is a patient-friendly score, calculated from donor age but adjusted for 12 potential risk factors, which can be used to guide acceptance decisions. At this early stage of familiarity, clinicians appear to be more persuaded by an unfavourable ADA quintile, than a favourable one. In this validation cohort, ADA strongly predicts early post-transplant outcome.

469

Adjusted Donor Age - a Simple Score Summarising Deceased Donor Risk in Transplantation

Dr Emma Morganti[1], Dr Dhriti Dosani[1], Dr Anamika Adwaney[1], Dr Christoph Mahler[1], Mr Frank Dor[1], Dr Rupert Bright[1], Dr Damien Ashby[1]
[1]*Hammersmith Hospital, Imperial College Healthcare Trust, London, United Kingdom*

Background:
Although a number of donor factors are known to affect outcome following deceased donor kidney transplantation, many units have no clear criteria for acceptance. Donor quality scoring systems such as KDRI are based on historic data sets, performing less well in the modern comorbid donor pool, and are difficult for patients to understand.
Methods:
All deceased-donor kidney offers at a single centre were analysed over a 12 month period, in order to develop a patient-friendly scoring system in which donor age is modified according to the presence or absence of a number of risk factors, to generate an "adjusted donor age", which would predict post-transplant outcome.
Results:
Out of 388 offers, from 301 donors, aged 6 - 84, 109 (28%) were accepted and transplanted. At 3 months post-transplantation, recipient GFR over 30 was seen in 80%. Organs were declined due to recipient factors in 26% and donor quality concerns in 46%.
Adjusted Donor Age (ADA) was derived incorporating 12 evidence-based risk factors: donor cardiac death, hypertension, diabetes, vascular disease, baseline kidney function, creatinine rise, oliguria, proteinuria, HLA match, cardiac arrest, use of adrenaline, and duration of hospitalisation before donation.
Quintiles of donor risk for all offers were identified using ADA cutoffs: 50, 60, 70, and 80. Increasing ADA quintile was associated with poorer post-transplant outcome, with good 3 month GFR (above 30ml/min) in 97, 85, 73, 81 and 38% of patients respectively ($p<0.001$). In those with functioning grafts (N=105) GFR at 3 months was strongly correlated with DKA ($R=0.430$, $p<0.001$) and was seen to reduce across increasing ADA quintiles (61, 52, 42, 41, and 29ml/min).
Conclusion:
ADA is a simple score based on donor age, adjusted for 12 donor-related risk factors, which strongly predicts post-transplant outcome, and is conceptually easy for patients to understand. Preliminary study of validity and influence on acceptance decisions has been undertaken.

470

Improving assessment of thrombotic and bleeding risk in chronic kidney disease: Evaluation of thromboelastometry (TEM) profiles

Dr. Alyaa Abdelmaguid[1,2], Dr. Lara N. Roberts[3], Ms. Erika Manolo[1], Prof. Beverley Hunt[4], Dr. Kate Bramham[1,5]
[1]King's Kidney Care, King's College Hospital NHS Foundation Trust, London, United Kingdom, [2]Medical Research Institute, Alexandria University, Alexandria, Egypt, [3]King's Thrombosis Centre, Department of Haematological Medicine, King's College Hospital NHS Foundation Trust, London, United Kingdom, [4]Thombosis and Haemostasis Centre, Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom, [5]Department of Women and Children's Health, King's College London, London, United Kingdom

Introduction:
Patients with chronic kidney disease (CKD) are at risk of both bleeding and thrombotic complications due to complex abnormalities in cellular, coagulation and endothelial components of the haemostatic pathway. Standard coagulation assays are unable to predict bleeding or thrombotic risk in patients with CKD. Comprehensive global assessment of haemostasis with thromboelastometry (TEM) are used in routine care in other clinical areas but their role in assessing the multifactorial defects in patients with CKD has not been explored.
Aims:
To assess the relationship between CKD severity and coagulation profile measured by TEM.
Methods:
Patients with CKD and healthy controls (HC) were invited to participate in a prospective observational study. Demographics, cause of renal disease and drug history were reported. Routine laboratory assays including renal function, full blood count and coagulation screen (International Normalised Ratio (INR) and Activated Partial Thromboplastin Time (APTT) were recorded. Citrated whole blood was evaluated by thromboelastometry using ROTEM® delta according to manufacturer's instructions. TEM included INTEM (IN), EXTEM (EX) and FIBTEM (FIB) test which reflect the activation of intrinsic and extrinsic pathway of coagulation and assesses fibrin contribution to clot formation, respectively. Parameters assessed were clotting time (CT), clot formation time (CFT), amplitude of the clot at 5 minutes after CT (A5) and maximum clot firmness (MCF).
Results:
120 CKD patients (10 Stage 2, 20 Stage 3, 20 Stage 4, 20 Stage 5, 20 established haemodialysis (HD), 10 new HD starters and 20 renal transplants) and 30 HC were recruited. Mean ages for the CKD and HC groups were 48 years (± 13) and 55 years (± 14) respectively (p=0.010).
There were no differences in INR and APTT between CKD patients and HC and no relationship with TEM parameters. There was no association between age and any of the TEM parameters. Results are presented in Table 1.
Overall, there was evidence of hypercoagulability in CKD patients compared to HC in TEM parameters where CFTIN,EX, A5IN,EX and MCFIN,FIB were significantly higher in CKD patients compared to HC ($p<0.01$). Haemoglobin, packed cell volume (PCV) and platelets were significantly lower in CKD patients than HC ($p<0.05$). Haemoglobin and PCV were negatively correlated with A5IN,EX (r=-0.50, -0.54 and r=-0.52, -0.57, respectively) and MCFIN,FIB (r=-0.49, -0.61 and r=-0.50, -0.62, respectively), and positively correlated with CFTIN,EX (r=0.47, 0.57 and r=0.49, 0.59, respectively) ($p<0.01$). However, platelets were positively correlated with A5IN,EX (r=0.44 and 0.40) and MCFIN (r=0.36) and negatively correlated with CFTIN,EX (r=-0.45 and -0.30) ($p<0.01$).
TEM profiles also suggested increasing hypercoagulability with worsening renal function demonstrated by negative correlations with eGFR and A5IN,EX (r= -0.33 and -0.36), MCFIN,FIB (r= -0.34 and -0.45) and a positive correlation between eGFR and CFTEX (r=0.41) ($p<0.01$).

Conclusion:
TEM suggests hypercoagulability in patients with CKD compared to controls despite the presence of anaemia and lower platelets, with more marked changes in patients on established HD. TEM is unlikely to be a useful tool for assessing bleeding risk but may have a role for predicting vascular access thrombosis or future cardiovascular risk, which cannot be assessed using standard coagulation tests.

471

Fibromuscular Dysplasia: One unit's experience

Dr Aine De Bhailis[1], Dr Constantina Chrysochou[1], Ms Emma Flanagan[1], Dr Edward Lake[2], Dr Amy Hudson[1], Prof Philip A Kalra[1]
[1]Salford Royal Foundation Trust, Salford, United Kingdom, [2]Manchester Royal Infirmary, Manchester, United Kingdom

Introduction
Fibromuscular dysplasia (FMD) is a non-atherosclerotic, non-inflammatory disease of medium arteries that has been described in every vascular bed with a wide variety of manifestations such as beading, stenosis, occlusion, aneurysm or dissection.
The United States Registry and European Registry for FMD have added to our knowledge of this rare disease, however questions remain. The RaDaR (National registry of rate kidney diseases) FMD in the unit aims to recruit UK based patients to a national registry. The vision is that this database will align with the European registry.
Our unit has the only dedicated clinic in the UK which aims to effectively diagnose, screen and treat those with suspected FMD. Here we describe the experience of a dedicated FMD clinic the first of its type in the United Kingdom.
Methods
Screening of patient records from January 2010 to October 2019 was undertaken for diagnosis of fibromuscular dysplasia, coronary artery dissection, middle aortic syndrome along with the acronyms "SCAD" and "FMD".
The diagnosis had to be confirmed in the vascular bed by angiography. FMD was diagnosed as non-atherosclerotic arterial stenosis affecting the trunk or branch of medium sized vessels, in the absence of aortic wall thickening, inflammation and known syndromic arterial disease
The diagnosis of SCAD was made based on coronary angiographic characterised by a tear in the arterial wall that is nontraumatic and non-iatrogenic with no secondary aetiology of the dissection

Clinical data collected included:

- Clinical presentations leading to diagnosis (i)Renal such as accelerated phase hypertension or poorly controlled hypertension (ii) Cerebral/Neck such as migraine, cerebrovascular events or tinnitus and (iii) Cardiac such as acute coronary syndrome
- Sex, age, positive family history, smoking history and number of anti-hypertensive agents
- Secondary prevention agents
- Intervention
- Formal screening

Results

From January 2010 to September 2019 36 patients were identified using the pre-specified search terms. 9 patients were excluded leaving 27 patients.
The median age was 50 with a 2:1 ratio for females to males.
Most patients with FMD (17/20) presented with a renal manifestation i.e. hypertension.
Renal artery FMD was confirmed by CTA/MRA in 20 patients. 60% had extra-renal screening. 11 patients had cerebral screening (8 CTA and 6 MRAs). 7 patients had aortic imaging (4 CTAs, 4 MRAs). 50% had head to toe screening as recommended by international guidelines.
50% of those with an FMD diagnosis were on a statin and 45% were on an anti-platelet agent.

In relation to those with an initial diagnosis of SCAD (5 patients), 3 patients had screening in terms of CTA/MRA and 1 patient was found to have cerebral vessel manifestations consistent with FMD.

Conclusion

A dedicated clinic for FMD allows for prompt diagnosis and appropriate screening for possible involvement of other vascular beds. It also allows appropriate treatment with secondary prevention agents such as aspirin and statins to those who are most likely to benefit. Although in its infancy there is great potential for this bespoke clinic to continue to expand to become a national centre of excellence.

472

IgG4-Related Disease in a patient with Hodgkin`s Lymphoma in remission: A case report.

Dr Benjamin FRANCIS[1], Dr FARID GHALLI[1]
[1]*Sussex Kidney Unit, Brighton And Sussex University Hospitals, Brighton, United Kingdom*

Background:

IgG4 – related disease (IgG4-RD) is a multisystem fibroinflammatory disease affecting the kidney and other different organs. It affects the kidney through inflammatory interstitial nephritis and retroperitoneal fibrosis. The presentation of lymphoma and IgG4 disease in the same setting is not common. Most of the reported cases were mucosa-associated lymphoid tissue (MALT) lymphoma in IgG4 ocular disease. In this abstract, we are presenting a case with IgG4 disease in a patient who had Hodgkin lymphoma.

Method:

A male 68-year-old diabetic gentleman was referred urgently to our nephrology clinic with rapidly worsening renal function. He had been treated for stage IVB Hodgkin`s lymphoma - nodular sclerosing two years previously with ABVD (Doxorubicin/Adriamycin, Bleomycin, Vinblastine, Dacarbazine) and was in full remission. At the time of referral, he was under hepatobiliary team investigating painless obstructive jaundice. Bile duct biopsies showed 15% of IgG4-expressing plasma cells. On review in the renal clinic, he was asymptomatic and examination was unremarkable.

Results:

Serum creatinine had risen from 119 to 293 µmol/l. Calcium was normal. He had a urine protein-creatinine ratio of 55 mg/mmol. ANCA, ANA and myeloma screen were all negative. There was however a significant polyclonal gammopathy with an IgG of 39 (raised levels of IgG1, IgG3 and IgG4). C3 and C4 levels were very low. Renal ultrasound showed unobstructed but enlarged kidneys, the right measuring 143mm and the left 130mm, with suspicion of possible infiltration.

An urgent renal biopsy showed that the kidney was heavily infiltrated with predominantly plasma cells which stained significantly (>40%) for IgG4. Other stains for malignant cell markers were negative. No Hodgkin-Reed – Sternberg cells were identified morphologically or with the aid of CD30 immunohistochemistry. He was diagnosed with acute interstitial nephritis due to IgG4-related disease.

He was treated with high dose steroids, and after two weeks his creatinine fell from a peak of 314 to 158 µmol/l. He remained symptomatically well and reported no side effects except needing to increase his insulin. He continued on a weaning course of steroids.

Conclusion:

Several case reports described the incidence of the lymphoma in patients with a pre-diagnosis with IgG4-RD. Another study has described that lymphoma may precede IgG4-RD, rather than the opposite. In this

case, despite the fact that the IgG4-RD was diagnosed after lymphoma remission, we think that IgG4- RD preceded lymphoma diagnosis. We noticed that serum creatinine started to increase and eGFR to decline in October 2016 i.e. 4 months before Lymphoma diagnosis in January 2017. Most of the lymphoma cases described in case reports were either MALT or diffuse large B cell lymphoma (DLBCL). In this case, we describe a case with Hodgkin`s lymphoma. Increase in IgG M, in this case, is more related to the lymphoproliferative disease rather than to IgG4 disease. Nephrologists should be aware of the possibility of incidence of lymphoma in patients with IgG4- RD. Further studies are required to investigate the relationship between both diseases and which one is a risk factor for the other.

473

Using the Duke Activity Status Index (DASI) to calculate Metabolic equivalence of Task (METs) in haemodialysis patients with chronic kidney disease as an alternative to exercise stress testing.

Miss Amy Joyce[1], Miss Claire Carswell[1], Dr Frank McCarroll[2], Dr Girish Shivashankar[2]
[1]Queens University Belfast, Belfast, United Kingdom, [2]Altnagelvin Hospital, Derry, United Kingdom

Introduction: Functional capacity is a measure that encompasses cardiorespiratory fitness, muscle strength, neuromuscular function, flexibility and balance. Functional capacity plays an essential role in clinically important outcomes of patients with chronic kidney disease including quality of life, morbidity and survival. It also has some predictive value in postoperative outcomes of patients undergoing renal transplantation. The current gold standard for measurement of functional capacity is exercise stress testing to find maximal VO2 output. This method is expensive, time consuming and not practical for all patients and is therefore not routinely carried out in clinical practice. The Duke Activity Status Index (DASI) is an alternative to exercise testing, where a short questionnaire is taken and Metabolic Equivalence of Tasks are calculated. It has several potential uses including assessing potential consideration for transplantation vs dialysis, monitoring functional capacity over time, screening for low functioning patients that may require support, incentivizing patients and units to improve physical activity as well as increasing awareness of the importance of functional capacity on outcomes. We administered the DASI questionnaire on 53 patients on hemodialysis in a Northern Ireland Renal Unit with the aim of assessing functional capacity of those considered and not considered for transplantation. We also aimed to assess whether the use of DASI was a practical alternative to exercise testing that could be incorporated into clinical practice.

Methods: We interviewed 53 patients using the DASI questionnaire while they attended the unit for haemodialysis. Scores were tallied and compared against age and sex as well as primary renal diagnosis and time since start of dialysis.

Results: The average MET for the entire unit was 5.44mlkg-1min-1. We found that METs decreased with age. The average MET in females was lower than males (4.94 vs 5.71 mlkg-1min-1). However, female average age was almost 10 years older than males (67.1 vs. 58.3 years). The trendline for METS fell from 5.81 to 4.61 mlkg-1min-1 when compared with time on dialysis ranging from 0 days to 4000 days. Patients were catagorised based on their primary renal diagnosis and average METs for each group was compared. Those with chronic pyelonephritis averaged the lowest scores of 4.17mlkg-1min-1 , while those with hypertensive renal disease scored highest with 7.9 mlkg-1min-1.

Discussion: From this process, we concluded that DASI alone cannot form the decision for transplant consideration, however is can be a valuable tool when used as part of the greater clinical picture. It is a relatively subjective form of assessment and therefore we suggest its use may be more appropriate for monitoring changes over time, where realistic individualized targets can be set and measured every 6 months. In previous studies using self-assessment, significant discrepancies have been found between presumed functional capacity by a clinician and a patients self assessment. Therefore, carrying out the DASI questionnaire in renal units may highlight these differences and impact treatment plan, patient outcome and overall motivation to improve functional capacity.

474

Improving the transition from paediatric to adult nephrology services: the impact of introducing a specialist young adult clinic

Dr Laura Skinner[1], Dr Sam Haywood[1], Dr Anjali Menon[1], Dr Christopher Dudley[1]
[1]*North Bristol NHS Trust, Bristol, United Kingdom*

Introduction

The transition from paediatric to adult nephrology services has long been identified as a high-risk time for young adult kidney transplant recipients(1). Graft loss is highest in this age group, irrespective of the age at which the graft was received(2). Non-adherence to medication is reported in up to 44% of graft losses and 23% of rejection episodes(3). The ISN and IPNA recommend that young adults are cared for by lead clinicians, supported by allied health professionals. In our Young Adult Clinic (YAC), established in 2011, patients were reviewed by a consultant nephrologist with a specialist interest in transitioning young adults, a specialist nurse, a youth worker and a clinical psychologist. Here we review the outcomes of young adults who attended the YAC as compared to those who received standard care in adult nephrology clinics at our institution.

Methods

We performed a retrospective analysis of outcomes in young adult renal transplant recipients from 2003 to 2019 (8 years prior and 8 years post establishment the YAC in 2011). Included were patients aged 25 and over at the time of analysis, who had been diagnosed with renal disease as children (under 18 years) and who had received their first renal transplant under the age of 24 years. Outcomes compared were rejection episodes and graft losses that occurred between 18-25 years in YAC and non-YAC patients. Non-adherence with immunosuppressive medications and/or clinic visits was recorded, in addition to primary disease, recurrent disease and immunosuppressive regimen.

Results

Of the 32 patients identified, 9 were reviewed in the YAC. The median age at which patients received their first renal transplant was 15.5 (range 7-23) years and 17 (range 2-23) years in YAC and non-YAC patients, respectively. In the YAC group there were no episodes of rejection, nor was there any documented non-adherence between 18-25 years. 22%(2/9) of YAC patients lost their grafts in young adulthood. In non-YAC patients, 43%(10/23) had one or more rejection episode and 30%(7/23) of patients lost their grafts. Non-adherence was documented in 30%(3/10) of non-YAC patients with rejection episodes; all three of which went on to lose their graft during early adulthood. Of all the non-YAC patients that lost their graft, compliance concerns were noted in 71%(5/7).

Discussion

This preliminary review of outcomes in young adult renal transplant recipients suggests that attending specialist YACs at our institution may be associated with improved adherence to medications, engagement in clinical review and in turn, lower rates of rejection and graft loss. Whilst we recognise the limitations of small sample size, our data supports previous reports of improved outcomes in those attending specialist transition services (4). MDT support of patients with complex physical and psycho-social health during adolescence is becoming increasingly recognised as an important contributor to their overall well-being in

adulthood. The adoption of an MDT approach could potentially improve outcomes across all specialities in which children with chronic illnesses transition into adult services. We plan to extend our review to include other UK specialist renal transition services.

475

Preventing Fatal Vascular Access Haemorrhage in Elderly or Disabled Dialysis Patients – Risk Factors and Practical Solutions

Dr Manjinder Singh[1], Zulfikar Pondor[1], Yvonne McGee[1], Nicola Clarke[1], Emma Jenner[1], Paul Hinchliffe[1], Julie Jackson[1], Margaret Baker[1], Toni Clough[1], Dr Rosie Donne[1]
[1]*Salford Royal NHS Foundation Trust, Salford, United Kingdom*

Introduction
Fatal Vascular Access Haemorrhage (FVAH) is one of the feared complications of haemodialysis access, with a global annual incidence of 0.4%. It is usually due to detachment of a scab, with the majority of bleeds occurring out of hospital. Education on the signs of vascular access (VA) at risk of bleeding is the cornerstone of prevention. It is also crucial that patients and carers are trained on immediate action to be taken in the event of a bleed. Guidelines on managing life threatening haemorrhage from VA were circulated by the British Renal Society in 2018 and implemented by early 2019. An elderly nursing home resident suffered a severe bleed from an arteriovenous fistula (AVF) during 2018. This prompted a review of our haemodialysis patients' understanding of and physical ability to manage a bleed occurring out of hospital.

Objectives
The primary objective was to assess patients' level of understanding of managing bleeding from their VA out of hospital. The secondary objective was to identify the reasons why patients were less able to manage a VA bleed out of hospital and then to develop individual measures to minimise the risks.

Methods
All haemodialysis patients dialysing via a fistula or graft (VA) were interviewed by dialysis nurses in May 2019. They were asked 5 questions with a mutually exclusive answer (yes or no) and results were analysed.

The following questions were asked:
1. Do you know what to do if your fistula/graft starts bleeding?
2. Can you read and follow the advice from the information leaflets?
3. Are you able to apply pressure on your fistula/graft when it bleeds?
4. Do you live alone?
5. Do you have access to telephone?

Results
All patients with VA (n=285) were interviewed across all dialysis sites within our renal service. Results showed that all patients had access to a telephone and 60 (21%) lived alone. Three patients (1%) did not know what to do if their VA started bleeding. 10 patients (3.5%) were unable to read and follow advice from the information leaflets. 9 patients (3%) had visual impairment. 17 patients (6%) were physically unable to apply adequate pressure to their fistula, 2 of whom lived alone.

Conclusion
Our study shows the importance of assessing each patient's ability to apply pressure to their fistula, especially in the context of their individual social circumstances. It highlights a small proportion of patients who would struggle to control a bleed from their VA because of frailty, comorbidity or living alone. There are currently no standard guidelines on effective preventative strategies in this setting. These patients and

their carers are likely to benefit from an individualised management plan and ongoing education to minimise the risks associated with dialysing via a fistula or graft. We recommend a variety of practical actions which can be taken and would be applicable to all dialysis units.

476

Mycophenolate Mofetil And The Incidence Of Skin Cancer In Kidney Transplant Recipients;A Secondary Data Analysis

Mrs Sarah Yusuf[2], Miss Himaja Bheemreddy[2], Dr Imtiaz Ahmed[1], Professor Nithya Krishnan[1]
[1]University Hospital Coventry and WarwickshireHS Trust, Coventry, United Kingdom, [2]Coventry University, Coventry, United kingdom

Over the years there has been a shift in the use of anti-metabolites agents from azathioprine to mycophenolate mofetil (MMF) based immunosuppression, due to its better efficacy and less implication in the development of skin cancer compared to azathioprine. However, MMF is still potentially carcinogenic.

Secondary data of 941 Kidney Transplant Recipients (KTRs) who received kidney transplantation, from 1st January1998 to 31st December 2018 were obtained. The incidence of skin cancer was determined in 429 KTRs immunosuppressed with MMF. Chi-square test of independence was used to determine the association between use of MMF based immunosuppression and the development of skin cancer, and to determine the risk factors associated with types of skin cancers developed.

MMF was associated more with the development of Basal cell Carcinoma (BCC) in both males and females 5(41.7%) Vs 5(50%) than Squamous Cell Carcinoma (SCC) 3(25%) Vs 2 (20%). Females had a higher incidence of skin cancer than males (10 (5.8%) Vs 12 (4.7%)) although this was not statistically significant (P=0.582). The BCC subtypes identified in females were nodular superficial and infiltrative BCCs, while males had mainly nodular BCCs. The SCC subtypes in females were moderately differentiated and well differentiated SCCs, while males had mainly moderately differentiated SCC. Being Caucasian and ≥ 50 years of age at transplantation were significantly associated with development of skin cancer (P=0.022 and P=0.005 respectively). Interestingly,Human Leucocyte Incompatible(HLAi) transplants were not associated with development of skin cancer.

We conclude that The BCC and SCC histological subtypes associated with use of MMF were not the aggressive forms. KTRs on MMF based immunosuppression will benefit from regular skin assessments to ensure early detection of skin lesions and prompt treatment.

478

Influence of Human Leukocyte Antigen Status and Gender of Positive Crossmatch Patients on Long-term Survival Outcomes of Antibody Incompatible Renal Transplantation

Dr. Nandhini Macha[1], Ms. Aisha Abimbola[2], Prof. David Briggs[3], Prof. Nithya Krishnan[4], Dr. Natasha Khovanova[5]

[1]Coventry University, Coventry, United Kingdom, [2]Coventry University, Coventry, United Kingdom, [3]Tissue Typing Lab, NHSBT, Birmingham, United Kingdom, [4]Consultant Transplant Nephrologist and visiting Professor, UHCW, Coventry, United Kingdom, [5]School of Engineering, University of Warwick, Warwick, United kingdom

*Purpose: Human Leukocyte Antigen (HLA) sensitization is a significant obstacle which limits the use of renal transplantation, but it serves as a therapeutic option for patients who are on transplant wait-list since long-time. Therefore, the aim of this research study was to investigate the factors affecting the long-term graft survival, which include type of pre-transplant HLA antibody class and gender of the crossmatch positive subjects.

*Methods: 130 patients who underwent HLA incompatible renal transplantation between the years 2003 and 2018 at our unit were included in this retrospective, single-centre study. Patients were categorized into HLA class-I, class-II, class-I&II and low-level HLA antibody groups to determine the effect HLA antibody class and their levels on the graft survival of the patients. Patients with Flow Cytometry (FC), Microbead (Bead) and Complement Dependent Cytotoxicity (CDC) positive crossmatches were further divided into two groups based on their gender.

*Results: The overall patient and graft survival at 10-years was 69.5% and 67.1% respectively. Graft survival for HLA class-I, class-II, class-I&II and low-level antibody groups at 10-years was 64.6%, 43.9%, 63.2% and 69.7% respectively, (low-level antibody group vs class-II group, *$P<0.05$). The graft survival for flow positive female and male patients at 10-years was 74.3% and 60.5% respectively ($P>0.05$). The graft survival for bead positive female and male patients at 10-years was 69.1% and 80.2% respectively ($P>0.05$). The graft survival for CDC positive female and male patients at 10-years was 15% and 67.1% respectively, *$P<0.05$.

*Conclusions: This study concludes that patient's with low HLA antibodies show better long-term graft survival. Whereas, patients with HLA class-II antibodies alone show worse long-term graft survival. CDC positive female patients were observed to show significantly worse long-term graft survival probabilities when compared to that of CDC positive male patients.

479

Choice experiments in older people with advanced renal disease: a 'think aloud' study

Dr George Kimpton[1,2], Dr Barnaby Hole[1], Dr Fergus Caskey[1,2], Professor Joanna Coast[1], Professor Rachael Morton[3]

[1]University Of Bristol, Bristol, United Kingdom, [2]North Bristol NHS Trust, Bristol, United Kingdom, [3]University of Sydney, Sydney, Australia

Introduction

Deciding between dialysis and comprehensive conservative care is challenging. It is critical that healthcare professionals understand which aspects of these treatments are important to patients.

Choice experiments allow quantification of the importance of treatment components and health outcomes. Individuals either compare several treatment options (Discrete Choice Experiment, DCE), or pick the best and worst attributes of a single treatment (Best Worst Scaling, BWS). The process relies upon individuals making balanced, rational choices which are quantified as the relative importance of attributes and acceptable trade-offs that a group of respondents will consider. A previous choice experiment suggested patients with kidney disease might trade up to 15 months of life expectancy of dialysis or conservative care in order to have the freedom to travel for important commitments.

No choice experiments have studied the preferences of older patients with kidney disease. The high rate of cognitive impairment in this group might make it difficult to undertake a choice experiment. We sought to understand how older people with advanced chronic kidney disease, with and without cognitive impairment, interact with an existing choice experiment.

Methods

We used electronic screening of hospital records at a tertiary renal unit to invite a group of patients aged over 65 years with an eGFR of less than 30mL/min/1.73m² to participate. Participants underwent the Montreal Cognitive Assessment (MoCA).

Recruitment used purposive sampling methods. Participants completed either a BWS or DCE survey and were interviewed using a 'think aloud' process, where they were encouraged to talk through their reasoning and thought processes.

Interviews were transcribed verbatim. We assessed the transcripts for task misunderstandings, misinterpretations and contradictory choices, referred to as errors. Error types were coded and tabulated before development of a coding framework.

Results

Twenty-six participants completed the MoCA, of whom 13 were interviewed whilst completing the choice survey. The median age was 80 (interquartile range 79 to 86). Mean eGFR was 17 mL/min/1.73m² (range 9 to 26). Six participants (46%) had a MoCA score of <26, indicating possible cognitive impairment (Range 20 to 30).

Errors varied with type of choice experiment completed, and level of cognition. Errors predominantly related to participants' comprehension of the purpose and rules of the task, or their understanding of the terms used. Participants often considered the presented survival statistics to be unrealistic when applied to them, or had difficulty conceptualising the presented treatments as they did not fit their expectations, changing the choices they made.

Those completing BWS often failed to understand the task and required extra explanation. Those completing DCEs made errors when trying to assemble a presented treatment into a whole. This inhibited their ability to compare treatments and resulted in potential errors in expressing their preferences. Participants expressed a preference for the DCE format.

Discussion

We found that older people with advance renal disease completed choice experiments but had high error rates. Choice experiments developed for this group must be well designed and comprehensively tested to aid understanding and reduce potential errors. This may be easier with DCE than BWS format.

480

Inpatient Electronic AKI Reports: Do they improve clinical outcomes?

Dr Hyun Lee[1], Dr Vinoth Gajendiran[1], Dr Nicolas Cole[1], Dr Bhrigu Sood[1], Dr Seema Jain[1]
[1]*Epsom And St Helier University Hospitals NHS Trust, London, United Kingdom*

Introduction: Electronic Acute Kidney Injury (AKI) reports within patient's electronic patient record (EPR) have been developed in recent years following the 2009 NCEPOD report of patients dying with a primary diagnosis of AKI.
At the time of this report, AKI Stage 2 and 3 mortality rates were reported to be higher than 30%. One third of AKI cases occurred after admission (Hospital Acquired AKI) and over 20% of these were thought to be preventable. The introduction of an algorithm generated, electronic AKI report that alerted clinicians to the diagnosis and subsequent treatment measures, was designed to improve clinical outcomes in these patients.
We investigated the clinical outcomes of patients in which the algorithm generated an AKI report for AKI stages 2 and 3 in a London NHS Trust that serves a population of approximately 500,000.
Methods: Inpatient AKI reports from 1st January to 31st December 2018 formed the dataset for this study. If a patient had several admissions with AKI, only the most severe was included in the analysis. The EPR was used to determine admission and discharge dates and date of death. Renal specific software was used to determine whether the patient received Acute Haemodialysis (Acute HD). CVVHF in ITU was not considered. Mortality was defined as death within 90 days of AKI episode. Hospital Acquired AKI was defined as the development of AKI Stage 2 or 3 occurring more than 48hrs after admission. Length of stay was determined using the date of AKI episode and the date of discharge or death.
Results: Over the 12-month period investigated, 968 Inpatients were identified as having AKI Stage 2 or 3. The median age 77 was and 50.4% were male.
Overall, 43.1% of patients died within 90 days of the AKI episode. 12.1% of patients had Acute HD. Interestingly, mortality of those who did have Acute HD was similar to those who did not (44.4% compared to 45.2% respectively).
As expected, more cases were 'Community Acquired' (70.8%) compared with those defined as 'Hospital Acquired' (29.2%).
However, mortality was higher in patients with Hospital Acquired AKI (56.9% compared to 37.4%, $P<0.001$). Similar numbers of patients with Hospital and Community Acquired AKI had Acute HD (11% and 12.6% respectively).
The overall mean length of stay was 13 days. However, the length of stay for patients with Hospital Acquired AKI was longer at 17.5 days compared with 10.5 days for those with Community Acquired AKI ($P<0.0005$).
Discussion: Despite the introduction of electronic AKI reports, patients with severe AKI continue to have a high mortality. This is especially true in patients with Hospital Acquired AKI, the patient group in which it was hoped would get the most benefit.
Although AKI reporting may increase awareness of the condition, it does not seem to have improved clinical outcomes compared to those reported in the UK before AKI reporting was introduced.
It may be that to truly improve outcomes in AKI, investment is required to adequately respond to these alerts, potentially via a designated 'AKI Team'.

482

Acute Kidney injury caused by IgA nephropathy induced by Anti-TNF-α therapy (Adalimumab): A case report

Dr Heba Nosseir[1], Dr FARID GHALLI[1]
[1]*Brighton And Sussex University Hospitals, Brighton, United Kingdom*

Introduction
Adalimumab is a biologic agent currently established for the management of different immune diseases e.g. rheumatoid arthritis, psoriatic arthropathy and Crohn's diseases. It exerts its immunological effect as an anti-tumour necrosis alpha (TNF α). Case reports points at using TNF α inhibitors as a potential cause of autoimmunity induction (e.g. systemic lupus erythematosus and vasculitis). In literature, both new IgA nephropathy and exacerbation of IgA nephropathy are reported. We are presenting a case with new-onset IgA nephropathy – biopsy-proven who was on adalimumab for psoriatic arthropathy.
Method
A 51-year-old lady had a medical background of psoriatic arthritis, hypertension, fibromyalgia, vertigo and asthma. She has been treated with sulphasalazine and adalimumab for her psoriatic arthritis under the rheumatology team. She had been on adalimumab (Humira) for 4 years before she was switched to a new brand called Imraldi in April 2019. She was referred to the renal team during hospital admission in July 2019 for a petechial rash with headache and throat pain. During this admission, she had acute kidney injury (AKI) as her serum creatinine increased from a baseline 73 to 131 µmol/l. Her CRP was raised and she was treated with antibiotics initially. She had Ultrasound of the urinary tract which was unremarkable and an immune screen came back negative.
Sulphasalazine and omeprazole were stopped during this admission as her AKI was thought to be due to interstitial nephritis related to antibiotics with a rash that was suspected to be related to Imraldi which was stopped as well.
Her serum creatinine improved slightly to 119 µmol/l but she was found to have significant proteinuria of 277 mg/mmol. The rheumatology team decided to restart her on adalimumab (Imraldi) again.
After restarting adalimumab her kidney function deteriorated as serum creatinine worsened to 208 µmol/l and reached a peak of 248 µmol/l. Her urine showed worsening urine PCR of 397 mg/mmol. Renal biopsy showed IgA nephropathy with acute tubular injury and element of tubulointerstitial nephritis on a background of moderate chronic tubular interstitial damage.
We decided to start her on prednisolone at this stage and we contacted her rheumatology team to stop treatment with adalimumab (Imraldi) as it was suspected to be the cause for her renal pathology.
Results
Since then her kidney function started to improve and her creatinine on her latest result shows an improving creatinine reaching 187 µmol/l. Her nephrotic range proteinuria showed a marked improvement to reach 39 mg/mmol.
Conclusion
This patient who developed AKI and IgA nephropathy showed marked improvement of her nephrotic range proteinuria and gradual improvement of her kidney function by stopping adalimumab and steroid treatment. IgA nephropathy is the commonest type of glomerulonephritis in the world and it is usually idiopathic. Deterioration of the kidney function after restarting adalimumab and the improvement of massive proteinuria to normal after drug withdrawal suggests a possible causal relationship between adalimumab and IgA nephropathy.

485

TAVI outcomes in dialysis patients; the experience of one tertiary referral centre

Dr Jamie Willows[1], Dr Mohammed Abdelmahamoud[2], Dr Swati Bhagat[3], Mr Douglas Muir[1], Dr Stephen Kardasz[1]

[1]James Cook University Hospital, Middlesbrough, United Kingdom, [2]Sunderland Royal Hospital, Sunderland, United Kingdom, [3]Cumberland Infirmary, Carlisle, United Kingdom

Transcatheter aortic valve insertion (TAVI) for severe aortic stenosis has emerged as an alternative for patients whose co-morbidites preclude open aortic valve surgery. Aortic stenosis is the most common symptomatic valve lesion in haemodialysis patients, and increased prevalence is observed in this population due to early valvular calcification. Unfortunately, it can contribute to significant symptoms for the patient, and can make achieving high quality haemodialysis challenging. Often dialysis patients have additional co-morbidities and would not be considered suitable for traditional open valve replacement.

Our aim was to review outcomes of all dialysis patients who have undergone TAVI at our referral centre, by means of retrospective case note review. Ten patient on dialysis (8 male, 2 female; 9 HD, 1 PD), had undergone TAVI between 2012 and the present. The average age was 76 years (range 55-87 years), and the average dialysis vintage was 6 years, and every patient had multiple other co-morbidities. All TAVI procedures were done via a transfemoral approach. The median length of stay was 4 days (range 2 to 17 days), though this was somewhat confounded by a case mix of elective procedures and emergency unplanned admissions. Though this was longer when compared to the non-dialysis population undergoing TAVI, it compares favourably with inpatient recovery time for open valve surgery even in patients without kidney failure. Overall symptom burden and/or dialysis tolerability was noted to be improved in most patients post-TAVI. Immediate complications occurred in two patients, one of whom developed an ischaemic leg on the table and required additional emergency vascular surgery, and one of whom had a recurrence of complete heart block post-procedure and required a fitting of a pacemaker, but both of whom did well long-term. Six patients have since died, with mean survival post-TAVI of 28 months in these patients.

Our data are consistent with other studies that show that TAVI is feasible in the dialysis population with correct patient selection, though short term post-operative risk is higher than in the general population. It is important for nephrologists and cardiologists to be aware of the good outcomes of this alternative to open valve surgery for severe aortic stenosis in dialysis patients, in order to be effective patient advocates.

486

The National Unified Renal Translational Research Enterprise (NURTuRE): A unique cohort of persons with chronic kidney disease and national biorepository

Dr Bethany Lucas[1], Prof Paul Roderick[2], Prof Paul Cockwell[3], Prof David Wheeler[4], Prof Phil Kalra[5], Prof Tim Johnson[6], Dr Uwe Andag[7], Dr Philipp Skroblin[7], Prof Robert Unwin[8], Prof Nicolas Vuilleumier[9], Mrs Fiona Robertson[1], Dr Liz Colby[10], Mrs Fiona Braddon[11], Ms Pip Croxford[11], Mrs Elaine Davies[12], Mr Michael Nation[12], Prof Moin Saleem[10], Prof Maarten Taal[1]

[1]University Of Nottingham, Derby, United Kingdom, [2]University of Southampton, Southampton, United Kingdom, [3]University of Birmingham, Birmingham, United Kingdom, [4]University College London, London, United Kingdom, [5]University of Manchester, Manchester, United Kingdom, [6]UCB Pharmaceuticals, Slough, United KIngdom, [7]Evotec International GmbH, Gottingen, Germany, [8]Astra Zeneca, Cambridge, United Kingdom, [9]University of Geneva, Geneva, Switzerland, [10]University of Bristol, Bristol, United Kingdom, [11]UK Renal Registry, Bristol, United Kingdom, [12]Kidney Research UK, Peterborough, United Kingdom

Introduction: Chronic kidney disease (CKD) is a common but heterogenous condition that is associated with multiple adverse outcomes. Substantial progress has been made in understanding mechanisms of progression and the pathogenesis of associated complications, but few new therapies have emerged over the past two decades and CKD remains a global health challenge. The NURTuRE-CKD cohort has been established to provide the first UK centralised renal bio-clinical resource with linked data to facilitate future research. Funding and governance is achieved via a unique collaborative partnership between Kidney Research UK, industry and academic investigators. The aims of the project are to improve risk prediction and promote a better understanding of the mechanisms driving adverse outcomes in CKD.

Methods: Recruitment was conducted at 15 nephrology centres in England, Scotland and Wales between July 2017 and August 2019. Eligible patients had an estimated glomerular filtration rate (GFR) between 15 and 59 ml/min/1.73m² or >60 ml/min/1.73m² with urine albumin to creatinine ratio (ACR)>30mg/mmol and had been assessed at least once in a nephrology clinic. Patients with idiopathic nephrotic syndrome were excluded. Participants underwent detailed assessment of their medical and drug history, answered a series of questionnaires related to quality of life and provided blood and urine samples. Biosamples were handled according to a strict standard operating procedure that required samples to be frozen within two hours of collection. Prior to freezing, samples were aliquoted to generate up to 132 aliquots per participant. Renal biopsies will be digitally scanned to create a histology archive and surplus tissue is available for further analysis. Follow-up visits and sample collection will be conducted at 12-18 months after recruitment. Routine laboratory data and clinical outcomes (onset of end-stage kidney disease, renal replacement therapy or death) will be collected by the UK Renal Registry for up to 15 years. Results presented here represent pooled data from individual hospital laboratories.

Results: Recruitment of 3004 participants was completed in August 2019. A summary of baseline data is presented in the Table. Completeness of data was excellent (>95%). The cohort is broadly representative of patients followed up in nephrology clinics in the UK. Almost half of the participants are 65 years or older and there is a predominance of males. The most common specific renal diagnosis is diabetic nephropathy (11.4%) but the largest diagnostic category is “CKD of unknown cause” (32%). Multi-morbidity is very common with more than 75% having two or more comorbidities.

Conclusion: NURTuRE-CKD has established a unique bioclinical resource to accelerate research on risk factors and mechanisms leading to adverse outcomes associated with CKD. The development of a national

renal biorepository is in keeping with the aims of the UK Renal Research Strategy. Biosamples and data will be made available to the research community via an independent access committee. Initial planned analyses will focus on a large panel of blood and urine biomarkers (n=35) as well as exome sequencing.

487

Introducing Northern Renal Alliance co-production team. Cementing the future for the renal service user at South Tyneside and Sunderland NHS Trust.

Miss Laura Thompson[1]
[1]South Tyneside And Sunderland NHS Trust, Sunderland, United Kingdom, [2]SIGNhd UK, National, UK

In 2018 The department of Renal medicine at a NE hospital formed Northern Renal Alliance (NRI). The group consists of renal staff, representatives from the Trusts operational department, renal patients experiencing different aspects of care, and representatives from a local and a national renal charity.

Initially, a meeting was arranged to discuss how patients could develop an independent peer support service. At the meeting it became apparent that there was an opportunity for the group to meet every 3 months and look at ways to improve the service as a team and cement co-production into the fabric of the organisation for future staff and service users.

NRI has continued to meet 3 monthly since 2018 in this short time the group have worked together on projects to improve awareness on renal replacement therapies and related treatment options, low clearance education days for patients and carers (monthly), education days (300+ attendees), home dialysis road shows (200+ attendees), the dialysis unit environment, information leaflets, recipe books. Staff update the group on developments within the service and have supported a dedicated space for patients to provide drop in sessions for all renal patients. Through feedback surveys the group review organised events to improve on in the following years.

As a group we have learned to understand how representatives perceive the organisation and have different priorities depending on their roles.

Future Aspirations:
The option of peer support for patients and families during clinics.
Future education days involving multiple hospitals within the region.
Out of hours self-care spaces for haemodialysis service users.
Improving the renal environment, especially in waiting areas.
Encourage patient feedback on planned service changes and related equipment purchases.
Expanding the home therapies service.
Continuation of shared care.

We aspire to introduce new members to the group to promote sustainability and widen opportunities for patients to be at the epicentre of the service.

488

Consent 4 transplantation: A single centre retrospective cohort analysis of transplant decision-making in adult kidney patients who lack capacity

Dr Rebecca Thom[1], Miss Rhana Zakri[2], Dr Antonia Cronin[2], Ms Elisabeth George[2]
[1]St Georges Hospital, London , United Kingdom, [2]Guy's and St Thomas' Hospital, London, United Kingdom

Introduction
The Supreme Court rulings Aintree (2013), and Montgomery (2015), mark the transition in medicine from paternalism to individualism concerning information provision, consent and "best interests" assessment. A comprehensive ethical and legal framework governs decisions for living donors who lack capacity as set out by the HTA. To date however, there has been little enquiry into decision-making in recipients who lack capacity. We examined our local consent procedure and practice for determining 'best interests' in kidney transplant recipients who were deemed to lack capacity and considered ways to improve our service.

Methods
A retrospective cohort analysis of adult kidney patients who were identified as lacking capacity and transplanted January 2000 - April 2019. Electronic and paper records were interrogated including original consent forms. Outcomes included patient and graft survival.

Results
We identified n=10 patients labelled as lacking capacity transplanted between January 2000 and April 2019, n=8 (80%) of which happened between 2015-2019. Mean age 36 years (range 18-59). In n=8, the disorder of the mind resulting in incapacity was learning disability (LD), 1 cerebrovascular disease and 1 degenerative metabolic disease. n=9 were on dialysis at the time of transplantation (n=1 pre-emptive failing transplant), mean 37 months on dialysis prior to transplant. n=4 had been transplanted previously. Six transplants were from living donors (n=5 related n=1 altruistic non-directed, and n=4 deceased donors (n=3 DCD and n=1 DBD). Only n=5 had a formal 'best-interests' meeting documented during work up however, all had been discussed at multi-disciplinary (MDT) meetings (either live donor or complex recipients). Psychology input was documented pre-transplant in one case. Themes from pre-transplant work up included - consideration of marginal / high-risk donors, communication, and transport. n=7 original consent forms were reviewed (3 missing from paper records). All consent forms examined were "consent 4" forms and completed by surgeons (3 consultants, 3 SPR/clinical fellows and 1 core trainee). Second signatories were present in n=5 and n=1 neither signatory were consultants. For all the next of kin or family had signed to confirm they were consulted. Themes identified from the best-interests assessment on consent forms were- improved quality of life and increased survival. Only one form referenced the patient's preferences.

Outcomes- n=9 are alive with functioning grafts - mean creatinine 144 (range 45 -290) and follow up 59 months (range 10-241). One patient died with a functioning graft 18 years post-transplant.

Discussion
Changes in the law, improved advocacy for, and attitudes towards people with LD and cognitive impairment is resulting in more patients who lack capacity being proposed as recipients. All our recipients had positive outcomes from transplantation however our analysis highlights some of the distinct considerations in such cases. Identified improvements to local practice include the development of a structured assessment of patients thought to lack capacity being proposed for transplantation. What is clear from the case law is that the emphasis on patient preferences for competent patients should be extended to patients who lack capacity. In future best interests decisions will be incomplete without these preferences being considered.

489

NURTuRE-INS - a national cohort study to facilitate stratified medicine in idiopathic nephrotic syndrome

Dr Elizabeth Colby[1], Fiona Robertson[2], Prof. Maarten Taal[2], Elaine Davies[3], Michael Nation[3], Wendy Cook[4], Prof. Tim Johnson[5], Dr Uwe Andag[6], Dr Philipp Skroblin[6], Prof. Robert Unwin[7], Prof. Nicolas Vuilleumier[8], Dr Ania Koziell[9], Dr Gavin Welsh[1], Prof. Moin Saleem[1]

[1]Bristol Renal, University Of Bristol, , United Kingdom, [2]University of Nottingham, Royal Derby Hospital, , United Kingdom, [3]Kidney Research UK, Nene Hall, Peterborough, United Kingdom, [4]Nephrotic Syndrome Trust, , United Kingdom, [5]UCB Celltech BioPharma, Berkshire, United Kingdom, [6]Evotec, AG, Germany, [7]Astra Zenca, Molndal, Sweden, [8]Hôpitaux Universitaires de Genève, Geneva, Switzerland, [9]Division of Transplantation Immunology and Mucosal Biology, King's College, London, United Kingdom

Introduction

Idiopathic Nephrotic Syndrome (INS) is a heterogenous disease and current classification is based on observational responses to therapies. The NURTuRE-INS cohort has been established as part of the UK-first standardised renal-biorepository with linked clinical data. It aims to develop novel methods to stratify patients for better disease management and to develop new treatments. This cohort builds on the existing NephroS-UK study and aims to add highly protocolled bio-sampling in a core subset of 800 prospectively collected INS patients over 3 years (NURTuRE-NephroS).

Methods

Patients are being recruited from 14 adult and 8 paediatric centres throughout Great Britain. Participants undergo a detailed clinical assessment, which is entered into an online database managed by the UK Renal Registry (UKRR). Once a participant is registered, all past and future routine laboratory data are captured by the UKRR. Outcomes with respect to end-stage kidney disease will be provided by the UKRR and data regarding survival and hospital admissions will be obtained from NHS Digital.

Serum, plasma, urine and blood for RNA and DNA extraction are obtained and processed according to strict industry standard operating procedures (SOP). Samples are split into 133 specimen aliquots and subsequently frozen within 2 hours. Specimens are centrally stored at the National Biosample Centre in Milton Keynes

The original histology slides and any surplus biopsy tissue blocks are being transferred to the Human Biomaterials Resource Centre at the University of Birmingham, where slides are digitally scanned and additional immunohistology conducted.

Follow-up visits and sample collection will occur depending on the patient's disease course: at relapse, remission and (before/after) transplantation. In addition, half the cohort (400 patients) will be followed up at a time dependent manner (at least 6 months after) their baseline visit.

Funding and governance is achieved via a unique collaborative partnership between Kidney Research UK, industry and academic investigators.

Results

Recruitment commenced in October 2017 and to date 580 patients have been recruited (369 adults, 211 paediatric). The cohort is due to complete recruitment in December 2020. Follow-up will take place between March 2020 - December 2021. Patients will have GWAS and exome sequencing undertaken by the industry partners with data shared with academic researchers – 169 patients have been analysed so far. Of the 580 patients recruited to date, 327 patients (257 adults, 70 paediatric) have had a biopsy as part of their routine clinical care. An MRC precision medicine programme grant based on the NURTuRE cohort is allowing the delivery of detailed molecular stratification, and further research studies are invited.

Discussion

NURTuRE-INS is a unique resource of high-quality patient samples alongside clinical data to mechanistically stratify patients to improve disease management and treatment.

In keeping with the goals of the UK Renal Research Strategy to establish a national renal biobank, access to the data and biosamples will be available to investigators in the UK by application to an independent Strategic Oversight and Access Committee.

Plans are already in progress to establish similar cohorts with national biobanks using the NURTuRE model in other kidney disease areas.

490

Post-Partum Microangiopathic haemolytic anaemia, thrombocytopenia and AKI: post partum haemorrhage vs complement mediated aHUS

Dr Kate Smith-Jackson[1,2], Dr Vicky Brocklebank[1,2], Mrs Lisa Batchelor[1], Dr Michal Malina[1], Dr Sally Johnson[1], Professor Neil Sheerin[1,2], Dr Edwin Wong[1], Professor David Kavanagh[1,2]

[1]National Renal Complement Therapeutics Centre, Newcastle Upon Tyne NHS Foundation Trusts, Newcastle Upon Tyne , United Kingdom, [2]Translational & Clinical Research, Newcastle University, Newcastle Upon Tyne , United Kingdom

Introduction

Thrombotic microangiopathy (TMA) can present during pregnancy and commonly in the post- partum phase. It can be a challenging diagnostic conundrum to dissect between; pre-eclampsia & HELLP syndrome, pregnancy associated atypical haemolytic uraemic syndrome (aHUS) and thromotic thrombocytopenia purpura (TTP). At the National Renal Complement Therapeutics Centre (NRCTC) we have seen a cohort of women presenting with Acute Kidney Injury (AKI) and microangiopathic haemolytic anaemia (MAHA) after a post- partum haemorrhage.

Methods

We conducted a retrospective case review of all women referred to the NRCTC with thrombocytopenia, AKI and MAHA in the post-partum period. A detailed review differentiated the cases into those with a large post-partum haemorrhage (PPH; blood loss >1 litre) and those without. Complement biomarkers and complement genotyping were undertaken in all cases.

Results

Between April 2013 and June 2019 ~750 individuals have been referred to the NRCTC with suspected aHUS. 178 were females of child bearing age (16-45 years old). Of these 10 had a history of a PPH. 3/10 were treated with eculizumab due to initial diagnostic uncertainty. The remaining 7 patients received supportive treatment. 6 out of the 7 patients who received supportive treatment recovered renal function. Three patients had renal biopsies which showed a range of pathology including TMA, Acute Tubular Necrosis and Cortical necrosis. In the PPH group no complement mutations were identified. This group was compared to the NRCTC cohort of post-partum complement mediated aHUS with complement mutations.

Discussion

Both PPH and complement mediated aHUS can present with AKI, MAHA and thrombocytopenia with differentiation initially challenging. In PPH, this phenotype is not associated with complement mutations unlike postpartum aHUS where >70% will have mutations. In PPH supportive treatment usually results in spontaneous resolution of the AKI, thrombocytopenia and MAHA unless cortical necrosis is present.

491

Point of Care Ultrasound leads to improvement in early diagnosis and intervention in Nephrology service provision

Dr Haroon Ayub[1], Dr Mohammad Adbelmahmoud[1], Dr Sarah McCloskey[1], Dr Shalabh Srivastava[1], Dr Rauri Clark[1], Dr Saeed Ahmed[1], Dr James Andrews[1]
[1]*South Tyneside And Sunderland NHS Foundation Trust, Sunderland, United Kingdom*

We have developed a local pathway to facilitate review and maintenance of arteriovenous fistulas using point of care ultrasound (PoCUS). We audited the results of PoCUS surveillance against departmental ultrasound scans and/or fistulograms via our electronic medical record (EMR) system to review what impact the new pathway had on the number of departmental scans performed and how accurate our PoCUS scans were in comparison.

In our trust, we are serving a population of around 300,000 people. There are approximately 250 patients on maintenance intermittent haemodialysis (IHDx) and a similar number in the pre-dialysis service. Dialysis access is commonly referred to as a 'lifeline' for a haemodialysis patient and the arteriovenous fistula (AVF) has long been the preferred access choice .

Duplex ultrasound allows for identification and localization of abnormalities which may potentially impair access function or patency. Stenosis of >50% identified on duplex exam has been correlated with access thrombosis within 6 months, prompt recognition and correction of access abnormalities at early stages may improve longevity and function of AVF. Local provision in our hospital for formal departmental ultrasound assessment of AVF and arteriovenous graft (AVG) for both routine maturation studies and emergent assessment for access dysfunction has fallen in the last few years.

This prompted the our group to develop their own pathway for AVF/ AVG assessment which has been incorporated into the EMR. Four consultants have been locally trained to provide a basic ultrasound fistula assessment which is performed as part of an interventional list running daily monday to friday. Patients are referred by dialysis nurses to our vascular access specialist nurse in the case of access dysfunction. These referrals are triaged and, if appropriate, the patient is scheduled for a PoCUS assessment within 24-48 hours. We also routinely screened all new AVF's with a 'maturation' study at six weeks post creation. We have audited the first three months of data reviewing the indication for ultrasound, the quality of our documentation regarding the ultrasound findings and results. Where the patients had any formal radiology departmental studies in the following three months, we compared and contrasted these results with our PoCUS assessment.

55 scans were performed in the first three months of the novel pathway. Documentation was deemed 'adequate' in 60% of cases. 8 cases of stenosis were detected over the three months, all of which were confirmed on formal departmental ultrasound or fistulogram. A further seven patients had departmental ultrasound studies, all of which also correlated with PoCUS findings. The mean wait time for a departmental ultrasound scan was 25 days. In patients with access dysfunction and stenosis identified on PoCUS, the mean wait time until fistulogram and fistuloplasty was 14.5 days.

This data suggests our PoCUS AVF assessment correlates well with formal departmental studies and leads to shorter waiting time for assessment and intervention in our hospital.

492

The SIMPLIFIED Registry Trial: Towards Delivery of Streamlined Dialysis Trials in the United Kingdom.

Dr Kerrie Brusby[1], Mr Paul Jones[1], Dr Simon Bond[1], Prof Ian Wilkinson[1], Dr Fergus Caskey[2]
[1]CCTU, Cambridge, United Kingdom, [2]UK Renal Registry, Bristol, United Kingdom

BACKGROUND

Dialysis-requiring kidney failure is associated with an unacceptably high risk of death and with reduced quality of life. Several interventions in wide clinical use may impact on outcomes, but have not been assessed in randomised trials, including phosphate lowering, dialysate sodium concentrations and 'natural' vitamin D. Conducting trials in this population is challenging.

The SIMPLIFIED trial was developed in partnership with the UK Renal Registry to test the hypothesis that supplementation with high dose colecalciferol would reduce mortality in patients receiving dialysis. The first trial of its kind in the UK, SIMPLIFIED relies entirely on routinely collected data to capture trial outcomes, and has the potential to revolutionise the way in which dialysis trials are conducted in the United Kingdom and beyond.

Here, we report trial progress to date.

METHODS:

In this open-label prospective randomised trial, UK dialysis patients are allocated to colecacliferol 60,000IU fortnightly or to control.

SIMPLIFIED uses a streamlined design which captures all trial endpoints via routinely collected data sources including the UK Renal Data Collaboration (biochemistry, demographics and RRT status), Hospital Episode Statistics or equivalent (hospitalisation-requiring adverse events), National Statistics (death) and the UK and Ireland Association of Cancer Registries (incidence of malignancy). Follow-up is conducted remotely via phone, paper, internet or smartphone application based questionnaires.

RESULTS:

The first patient was enrolled in March 2017. At the time of submission, 47 centers of a target 50 were actively recruiting. Linkage of patient records with datasets from the UKRDC, NHS Digital and the SAIL Databank have been successfully established. An interim analysis of Vitamin D sampling on 206 subjects has demonstrated a clear separation of Vitamin D levels between the standard and treatment arms. Contemporary data on trial recruitment and progress, including plasma vitamin D separation between trial arms, will be reported at UK Kidney Week.

Obstacles encountered included delays in agreeing, funding and establishing data linkage, and agreeing coverage of excess treatment costs.

CONCLUSIONS:

SIMPLIFIED will be the first UK nephrology trial to use routine data exclusively for trial follow-up. Systems established for SIMPLIFIED serves as proof of concept for future streamlined registry trials in the United Kingdom.

493

Peritoneal Dialysis Catheter Insertion under Local Anaesthesia: A Single Centre Tertiary Care Renal Unit Experience.

Dr Abhay Sharma[1], Dr Benjamin Perren[1], Dr Mark Vicuna[1], Dr Bhrigu Sood[1], Dr Subash Somalanka[1]
[1]*South West Thames Renal & Transplantation Unit, St Helier Hospital, Carshalton, United Kingdom*

Title:- Peritoneal Dialysis Catheter Insertion under Local Anaesthesia: A Single Centre Tertiary Care Renal Unit Experience

Objectives:- Peritoneal dialysis [PD] is one of the modalities of renal replacement therapy [RRT]. A Tenckhoff catheter is inserted into the peritoneal space to deliver PD. Patients with previous abdominal surgery are at risk of having adhesions. In such patients, the procedure is traditionally performed by a surgically assisted PD catheter [SAPDCI] insertion technique under general anaesthesia [GA]. Patients often have large abdominal scars and are required to stay overnight due to prolonged recovery time. Moreover, these patients have significant cardiac morbidities and are usually not suitable or are at a higher risk of having GA. We share the outcomes of inserting percutaneous PD catheter insertion under local anaesthesia [LAPDCI] and light sedation in comparison to SAPDCI.

Methods:- Our unit uses a coiled tenckhoff catheter [KIMAL] for SAPDCI & LAPDCI. All patients received prophylactic iv vancomycin 1hr prior to the procedure. LAPDCI group received anti-emetics, iv fentanyl 50 mcg +/- midazolam 1mg during the procedure. SAPDCI group received GA. All patients received the same aftercare and training from the PD unit/staff. Data were retrospectively collected from April 2017 to April 2018 from the hospital patient electronic records, PD unit notes and analysed using Microsoft excel 2010.

Results:- A total of 86 catheters were inserted in 83 patients [male (M): female (F):: 47:36]. 73% (n=63; M: F:: 38:25) were LAPDCI vs 27% (n=23; M:F::9:11) were SAPDCI insertions. 35% (n=29) have diabetes. 23 of the LAPDCI vs 9 of the SAPDCI are still in use. Duration of catheter days in those who had the catheter removed: LAPDCI [mean - 232.7, median - 140.8; SD – 196.4] vs SAPDCI [mean -181.7, median – 196.9, SD – 84.7]. 43% [27] of LAPDCI vs 83% [19] of SAPDCI were patients with previous abdominal surgery. 25 patients from LAPDCI vs 5 from the SAPDCI group were switched to haemodialysis. Five patients in LAPDCI vs one in SAPDCI group received renal transplantation. Two patients in the SAPDCI group had successful LAPDCI; however, only one patient from LAPDCI needed SAPDCI. Peritonitis after 6 months of catheter insertion was noted in 27% cases [n=17] of LAPDCI vs 13% [n=3] in SAPDCI group. There was no procedure-related complication and injury to the viscera in either of the groups.

Conclusions:- LAPDCI in this unit is physician-led. Previous abdominal surgery can lead to peritoneal adhesions and such patients often require SAPDCI. In our unit, LAPDCI is performed under ultrasound and fluoroscopy guidance to assist in needling the peritoneum and satisfactory placement of the catheter. In our cohort, a significant number (43%) of patients who underwent LAPDCI had previous abdominal surgeries. There was no significant difference in the complications. LAPDC insertion is a safe and effective way of providing definitive access for PD in those with previous abdominal surgeries. It is cost-effective, spares surgical and theatre time for more complex procedures. It improves patient satisfaction by reducing patient stay and avoiding the risk of GA.

494

Renal interprofessional simulation and education (RISE) – using in situ simulation based education to enhance patient care and safety

Dr William Booth[1], Dr Saeed Ahmed[1], Dr James Andrews[1], Dr J Wood[1], Dr Sarah McCloskey[1]
[1]*South Tyneside And Sunderland NHS Trust, , United Kingdom*

Background
Simulation is an effective teaching tool that often takes place in a designated learning environment.1 Moving simulation into the workplace has been shown to be beneficial for learning and improve patient outcomes.2 Nevertheless, there is little supporting literature on the efficacy of in-situ simulation on a Haemodialysis unit.

Aims
To asses if in situ simulation based education delivered on a Haemodialysis unit, offers effective training for staff and if patient care can be improved through identification of latent conditions.

Methods
Nurses and health care assistants attended a half-day teaching session delivered on the outpatient Haemodialysis unit at a district general hospital. Candidates were divided into groups and given the opportunity to manage three medical emergency scenarios (gastrointestinal bleed, anaphylaxis or sepsis) for a simulated patient who was undergoing dialysis. A mannequin was developed that could be connected to a dialysis machine via a tunnelled neck line or forearm AV graft. This allowed the scenarios to run whilst using the equipment as it would be in clinical practice. A debrief was held following each case with a focus on clinical learning points, human factors and patient safety.

Pre and Post-course questionnaires were given to all candidates who took part. They assessed candidate's confidence in managing medical emergencies. Confidence in non-technical skills such as teamwork, prioritisation, seeking help and leadership were also evaluated. Candidates were given a multiple-choice questionnaire (MCQ) with questions designed to assess the skills and knowledge taught on the course.

Results
Twenty-five pre-course and twenty-eight post-course questionnaires were completed. There was a significant improvement in candidates confidence in assessing the clinical scenarios tested: Upper GI bleed ($P<0.001$), anaphylaxis ($P<0.001$), and septic shock ($P<0.001$). Eleven participants highlighted a latent condition that had the potential to impact patient care. The most commonly detected condition was that simulation improved staffs awareness of the environment, such as "how to find equipment in a resus trolly".

There were twenty-four pre and post-course MCQs completed. All candidates improved their scores with a mean increase from 9.92 to 12.13, $n=24$ ($P<0.001$) following the simulation.

Discussion
In situ simulation is an effective method for training staff how to manage acutely unwell patients on dialysis. Improved confidence in the management of acute scenarios was supported by an improved knowledge base and enhanced human factors skills.

In-situ simulation also offers the opportunity to detect latent conditions before they can cause harm to patients. Developing an understanding of the environment you are in and placement of emergency

equipment are unique opportunities that in-situ simulation offers, which cannot be replicated in the classroom environment.

The RISE program presents a unique form of in-situ simulation training and is part of a wider educational model providing simulation based education and procedural competencies in Renal medicine at the Interventional Diagnostic Nephrology Centre. This type of in-situ simulation training also has the potential to support trainees who are returning to clinical practice or have specific identified learning needs in non-technical skills and human factors.

495

The association between kidney biopsy and socioeconomic deprivation in patients with diabetes

Dr Tomos Sennitt[1], Dr Rhodri Pyart[1]
[1]*University Hospital Of Wales, Cardiff, Cardiff, United Kingdom*

Introduction
Patients with diabetic nephropathy are more likely to come from socioeconomically deprived areas and they have poorer outcomes. Diabetic nephropathy is usually a presumptive diagnosis with kidney biopsy reserved for cases with clinical suspicion of non-diabetic renal disease. A lack of consensus on timing and indications for biopsy may result in biopsy practice pattern differences between clinicians. We sought to explore the association between biopsy rates and socioeconomic deprivation in patients diagnosed with diabetic nephropathy in a large tertiary renal centre.

Methods
The local renal database was used to retrospectively identify patients under the care of nephrology coded as having a primary renal disease of diabetic nephropathy. Diagnoses were further divided as biopsy proven or clinically diagnosed. The National Index of Multiple Deprivation was used to map patient post codes into small areas of relative poverty which were then grouped as quintiles (1 and 5 being most and least deprived quintiles respectively). The numbers of cases of biopsy and clinically diagnosed diabetic nephropathy were respectively calculated for each quintile of relative deprivation. Data on proteinuria and the presence of diabetic retinopathy was collected from the database and compared to levels of deprivation in those patients receiving a biopsy.

Results
1,515 patients had a primary renal disease of diabetic nephropathy with 35 (2.3%) patients having been diagnosed on kidney biopsy. The median age of patients diagnosed by biopsy was 57 years (IQR: 47-63) and 72 % were male.
Higher deprivation was associated with diabetic nephropathy diagnosed without biopsy (figure 1). In biopsy proven diabetic nephropathy, there were peaks in diagnosis in the most and, to a lesser extent, in the least deprived quintiles.

DN: diabetic nephropathy
Figure 1. Distribution of patients diagnosed with diabetic nephropathy (with and without biopsy) by relative social deprivation
In the patients receiving a biopsy, median proteinuria was 396 mmol/mol (IQR: 91-890). Lower deprivation was associated with lower proteinuria (p=0.043). 61% of biopsied patients had documented diabetic retinopathy but this did not significantly vary with deprivation.
Discussion
Diabetic nephropathy is associated with increasing deprivation and the vast majority do not have a biopsy. Studies have shown that non-diabetic kidney disease is common in patients with diabetes and our data suggests that despite lower levels of proteinuria, less socially deprived patients with diabetes may be more likely to have a kidney biopsy. This could result in more deprived patients being presumptively misdiagnosed with diabetic nephropathy but conversely expose other patients to unnecessary biopsy risk. Education is one of the measures of social deprivation and better educated patients are known to be more engaged in the management of their health and this could be influencing clinician decision making.

However, there are likely to be unmeasured confounders influencing the decision to biopsy and the absolute number of biopsied patients remains small.

496

Assessment of autonomic response in haemodialysis induced hypovolaemia: comparative analysis of haemodynamic parameters with power spectra of heart-rate variability

Professor Jill Stewart[1], Professor Paul Stewart[1], Mr Thomas Walker[1], Dr Latha Gullapudi[2], Dr B Lucas[2], Dr Nick Selby[2], Professor Maarten Taal[2]

[1]University Of Derby, Derby, United Kingdom, [2]University of Nottingham/Royal Derby Hospital, Derby, United Kingdom

Introduction:
Haemodialysis causes circulatory stress, leading to abnormal haemodynamic and cardiovascular function with long-term consequences including ischaemia and end organ damage. Underlying mechanisms are not fully explored, but it appears that cardiovascular regulatory mechanisms are unable to compensate for haemodialysis-induced hypovolaemia. Using continuous intra-dialytic haemodynamic monitoring and analysis of beat-to-beat heart rate variability (HRV), we explore the sequential changes in cardiovascular regulatory mechanisms to understand their role in the pathogenesis of acute hypotension.
Methods:
50 participants aged >18 years were recruited from our prevalent dialysis population. Patients' demographics, dialysis background, dialysis prescription and laboratory parameters pre- and post-dialysis at each session were recorded. All participants had continuous non-invasive monitoring of heart rate via ECG, and haemodynamic parameters using pulse wave analysis (Finapres NOVA) during three consecutive dialysis treatments over one week. The reconstructed central aortic waveform allowed calculation of a full range of continuous haemodynamic variables including blood pressure and cardiac output. HRV was assessed by spectral analysis of the sequence of R-R intervals and the corresponding times of R-wave detection derived from the ECG.
Spectral analysis is a reliable tool for investigating the efficiency of short-term compensatory response to perturbations in the circulatory system. Two significant rhythms oscillating at specific frequencies are identified during haemodialysis: These are High Frequency (HF = 0.15 – 0.4 Hz) correlated with vagal tone on the sinus node and regarded as a marker of efferent parasympathetic activity; and Low Frequency (LF = 0.05 – 0.15Hz) due to baroreceptor-mediated regulation and includes contributions from both sympathetic and parasympathetic divisions. The efficiency of the autonomic response to hypovolemia was evaluated by the ratio of powers in the LF and HF bands.
Results:
In total, 44 participants completed all three dialysis sessions with continuous haemodynamic monitoring. 61% were males, mean age was 62.3+/-16yrs and 43% had diabetes. Analysis of standard haemodynamic parameters showed intradialytic trends in keeping with previously reported data (figure 1a), and patients were classified as 'stable' or 'unstable' according to their history of cardiovascular collapse.
Groups of patients could not be distinguished on the basis of haemodynamic parameters, but spectral analysis of beat-to-beat HRV showed markedly different patterns that divided the population into two groups. The 'stable' group had LF/HF increasing during treatment with power concentrated mainly in the LF band. The 'unstable' group showed declining LF/HF and power concentrated mainly in the HF band - this could indicate the lack of strengthening of sympathetic activation and thus a reduced short-term capability to compensate for hypovolaemia (figure 1b).
Conclusions:
Reduced efficiency in the autonomic control of cardiovascular functions could be the main cause of haemodynamic instability in patients prone to intradialytic complications. Spectral analysis of HRV provides a robust mechanism for predicting patient's response during treatment

497

Open label randomized controlled study to evaluate the role of Metformin to retard the progression of ADPKD

Professor Arpita Ray Chaudhury[1], post doctoral trainee Manas Goswami
[1]*Ipgmer, Kolkata, Kolkata, India*

Autosomal dominant polycystic kidney disease (ADPKD) is the most common of the inherited renal cystic diseases, contributes to 7- 10% of ESRD patients requiring dialysis. Currently the treatment for ADPKD lacks an effective therapy to retard the progression of the disease. AMPK(AMP activated protein kinase) activation may decrease cell proliferation in cyst wall and fluid secretion in cyst; thereby retarding kidney growth and disease progression. Metformin , a common oral hypoglycemic agent, activates AMPK. Though animal studies show promising result, human studies are few. Current study was planned with hypothesis that patients receiving metformin may have less increase in total kidney volume (TKV) at the end of 1 year follow up than the patients receiving placebo.
Material and methods:
70 ADPKD patients, with eGFR > 45ml/min were randomly assigned to either metformin or placebo arm in 1: 1 block. Diabetics, pregnant, breastfeeding females, patients suffering from liver disease were excluded. BP target was fixed at 130/80 and ACEI/ARB were used as 1st line antihypertensive. Primary outcome was percent change in TKV as measured by MRI with planimetry method. Secondary outcomes were percentage change in eGFR and proteinuria from baseline. difference in flank pain episodes requiring analgesic intake, numbers of minor and major adverse events. All the patients were subjected to a detailed clinical and laboratory evaluation at baseline, along with TKV estimation by MRI . In the metformin group patients were given Tab. Metformin 1000 mg/day in two divided doses to start with and increased to 1 gram twice daily. Patients in the placebo arm were given placebo tablets in BD dose. Patients were followed up at 3 monthly intervals. Physical examination and biochemical evaluation (serum creatinine, eGFR by MDRD formula, and 24 hour urine protein test) were performed at each visit. Repeat MRI were obtained at the end of 12 months. Any adverse effects reported during the study period were noted.
Results: Total 60 patients (30 patients in each group) was available for final analysis demographic and biochemical parameters like serum creatinine, eGFR and proteinuria were not different among the two groups at baseline with similar BP control in both arms. Mean TKV, as measured by MRI, at baseline, was 588.33 cc vs 563.71 cc in metformin vs control arm. At MO12 increase of TKV by 0.11% (intervention arm) and 1.01%(control arm) were observed , p value (0.001).When analysed among two age groups (< 45 and >45 years) percent change of TKV in metformin arm becomes even more significantly better (p value 0.00026) in the younger age group. Intervention arm shows better proteinuria control (M0,169.10 and M12: 141.10mg/day, 15.79% decrease and placebo arm M0:186.62 and M12 182.05 mg/day , 2.89% decrease, p value 0.00004), less eGFR decline though not significant. Pain episodes in metformin vs control arm were 72 vs 63., dyspepsia being the commonest side effect in metformin arm.
Conclusion: Treatment with metformin significantly slows the rate of growth of kidney volume and reduces proteinuria in patients with ADPKD at one year compared to the placebo group.

498

Frailty is associated with ESRD choices but executive function impairment may impact patient decision making

Dr Nutchaya Ungcharoen[1], Michelle Barratt[1], Sonia Walton[1], Heather Harper[1], Dr Dariusz Rudzki[1], Dr Stephen John[1]
[1]*University Hospitals Birmingham, Birmingham, United Kingdom*

Background
There are a growing number of people with end-stage renal disease (ESRD) requiring consideration of renal replacement therapy (RRT). The decision-making to initiate these patients on dialysis or non-dialysis medical (conservative) therapy is complex. This is in part due to high prevalence of frailty among our ageing population and the volume of details regarding the simultaneous benefits and variable burden of each therapy option - whether haemodialysis (HD), Peritoneal Dialysis (PD) or Conservative/supportive.
Frailty is a clinical syndrome characterised by increased vulnerability to adverse outcomes as a result of reduced physiological reserve and multisystem decline. In ESRD, frailty is associated with poor clinical outcomes and mortality. A multidimensional and comprehensive assessment is, therefore, required to assist patients and clinicians in this shared decision-making process.
We aimed to assess cognitive function and frailty among patients with ESRD, and evaluate their association with choice of dialysis/non-dialysis modality.

Methods
All patients were from a single UK renal centre. Overall frailty was assessed by the Clinical Frailty Score (Rockwood, scored 1-9), and cognition by both Abbreviated Mental Test 4 (AMT-4) and Clock Drawing Test (CDT).
CFS is a 9-point frailty assessment tool, ranging from a scale of 1 (very fit) to 9 (terminally ill), based on clinical descriptors and pictographs of functional status.
AMT-4 is a rapid screening tool for memory impairment, by 4 questions (age, date of birth, year and location, scored 0–4)
CDT is a 3-point screening tool for executive and visulo-spatial function; 1 point is earned for each of Clock : 1) contour, 2) numbers and 3) hands indicating the correct time.

Results
We evaluated 552 patients. 44% were female, mean age 68.1±15.1 years (range 18-99).
The majority (388) had CKD 4/5, with the remainder already on RRT.
Mean CFS was 4.1 (range 1-9) and was similar in both CKD and RRT (4.1, 3.9, p=0.10).
CFS was different in CKD patients dependent on RRT choice. Frailty was higher in those planning for Conservative vs RRT treatment (5.6, 3.9, p<0.0001) but lower in PD vs HD (3.7, 4.1, p=0.015). There was no difference by PD sub-type. People without a decision yet were similar to those who had an ESRD plan (3.8, 4.2, p=0.26).
AMT-4 proved to be poorly discriminatory with 337 of 356 patients scoring 4 and no correlation with CFS.
CDT however was highly variable (mean 2.25, range 0–3, n=44). There was a suggestion of lower CDT in Conservative patients but numbers were small (Conservative 1.5, RRT 2.3, p=0.15). CDT did negatively correlate with CFS (r=-0.36, p=0.01)
Although not designed as a mortality project, CFS was significantly higher in those (48) who died (5.3, 3.9, p<0.0001).

Conclusions

Frailty presents a significant burden in ESRD, both with and without RRT. It is associated with RRT choices; frailer people are more likely to opt for HD or non-dialysis treatment. Assessment of cognition is needed, primarily by executive function rather than memory. This may have an important impact on people's ability to make complex decisions around their future ESRD care.

499

Alteplase versus urokinase in restoring blood-flow in haemodialysis - catheter thrombosis

Mrs Tamasin Stevenson[1], Miss Sarah White[1], Dr Jyoti Baharani[1], Dr Manvir Hayer[1]
[1]*University Hospitals Birmingham, Birmingham, United Kingdom*

Background
Central venous catheters (CVCs) are used in up to 15%–20% of patients undergoing haemodialysis (HD) as a source of vascular access. Thrombosis of CVC in HD patients is common, and it can lead to the elimination of vascular sites.
The reported incidence of catheter occlusion due to thrombosis ranges from 5% to 80% in the HD population. We wished to examine the efficacy of alteplase versus the use of urokinase in our HD population to see which was more efficacious as the optimal management of an occluded dialysis catheter remains unclear.

Methods
The effectiveness of alteplase and urokinase in restoring adequate HD blood-flow rates was examined. A retrospective review was completed by using medical records of HD patients with central venous catheters, receiving alteplase or urokinase for presumed catheter thrombosis.
Patients received 2 mg of alteplase administered to the length of each catheter lumen or urokinase 12,500 units administered as a push lock to each catheter lumen.
Effectiveness of thrombolysis was defined as achieving a post treatment HD blood-flow rate of > 300 mL/min, maintained for at least 30 minutes during the dialysis session.
Results
Both thrombolytic agents significantly increased the HD blood-flow rates.
Patients with alteplase treated catheters were twice as likely to achieve HD blood-flow rates of > 300 mL/min and were more likely to complete HD during that session (87% versus 70%)
The percentage of functioning catheters at a subsequent HD session did not significantly differ between groups.
Most patients in both treatment groups required no further interventions.

Conclusions
HD blood-flow rates increased after either alteplase 2mg or urokinase 12,500 units was used to clear presumed catheter thrombosis. Alteplase was more likely than urokinase to result in a HD blood-flow rate of > 300 mL/min.
Alteplase was therefore slightly superior to urokinase in restoring blood flow through catheters. However, further studies are necessary to identify the risk factors for catheter occlusion and compare the efficacy, safety and cost of different thrombolytic agents in the treatment of mechanical dysfunction of CVC for HD.

500

The impact of an AKI improvement programme and an AKI nurse on outcomes in a busy district general hospital

Dr Gowrie Balasubramaniam[1], Mrs Linda Lio[1], Mrs Kelly Moore[1], Mr Matthew Jones[1]
[1]*Southend University Hospital, Southend, United Kingdom*

Southend University Hospital is a 600-bedded busy district general hospital. We initiated an acute kidney injury quality improvement programme with the introduction of electronic AKI alerts in 2016. The programme consisted of a simple, standardised pathway which follows the "STOP" AKI framework. In 2018 we appointed an AKI nurse to help educate all healthcare staff and ensure consistent pathway implementation. The aim of the programme was to reduce the numbers of AKI 1 and 2 from progressing to a 2 or a 3. We defined this as AKI progression.

We have recoded 14151 episodes on AKI from April 2016 to December 2019. 702 AKI was detected on ITU patients and were excluded, leaving 13,449 episodes for further analysis. 5030 (37%) were from the community (including acute areas such as acute medical ward and A+E) and 8419 were in-patient episodes (63%). AKI stages 1, 2 and 3 were 3894 (77%), 758 (15%) and 378 (8%) respectively from the community; and 6468 (77%), 1217 (14%) and 734 (9%) respectively from in-patients.
The rate of progression for community acquired episodes was 1.5% vs. 6.4% for in-patient episodes. 30-day mortality in the community AKI was 20% for community episodes compared with 25% for in-patient episodes. Figure 1 the trend in overall 30-day mortality (red line) and the numbers of AKI episodes (blue bar chart). There appears to be a seasonal variation to AKI episodes, with associated increase in mortality during winter months. There was a trend downwards in the setting on increasing numbers of AKI (bar chart) with a clear shift early 2019 following the appointment of the AKI nurse.

The robust implementation of a pathway and an AKI nurse showed a trend towards improving 30-day mortality even in the face of increased winter pressures and limited resources. The AKI nurse is a key tenant of improving AKI care and should be part of any improvement programme or future studies.

502

30-day readmission metric as a quality measure

Dr Harsha Wodeyar[1]
[1]*Liverpool University Hospital, Liverpool, United Kingdom*

Background
Whilst demand for acute hospital beds has increased exponentially over the last decade there has been a paradoxical reduction in the total available acute care hospital beds. Predictably, the bed occupancy rates have significantly increased with hospitals often reporting occupancy rates above the safe limits. This supply and demand mismatch have a negative impact on both the quality of care delivered to the patients and staff experience. Organisation's response to bed shortage and overcrowded A&E are often resource reallocation and cancellation of elective activities. Whilst directing resources towards meeting the increased demand is essential, it's also important to continue to explore innovative ways of moderating the demand. Reducing 30-day hospital readmission by improving the post discharge care of patients is one such way of moderating the demand. Reducing 30-Day Readmission using Discharge Care Bundle study is a prospective randomised controlled trial conducted at a University Hospital in UK. This is the first randomised control trial testing interventions aimed at reducing 30-day readmission in dialysis population. The interventions used in this trial are informed by the evidence from previous observational studies bundled together.

Method
Patients on regular haemodialysis treatment in units attached to University Hospital who had planned or unplanned hospital admission were eligible to participate in the trial. 83 patients were recruited in the trial over the period of 8 months. Primary outcome measured was emergency unplanned readmissions within 30 days of discharge from the index admission. Secondary outcome measured was the impact of discharge care bundle on patient's Health Related Quality of Life(HRQOL) using EQ-5D-5L questionnaire.

Results
The odds of 30-day readmission for a patient in the study group was 0.66 the odds for a patient in the control group (95% Confidence Interval [CI] 0.239 to 1.85; p=0.43).There was statistically significant association between length of stay during the index admission and risk of 30-day readmission (95% CI 1.002 to 1.10; p=0.039). In sensitivity analysis excluding the early readmission within a week of discharge the odds of 30-day readmission for a patient in study group was 0.41 the odds of readmission in the control group (95% CI .131 to 1.32 ; p=0.138). Study group reports improvement in the HRQOL in all dimensions except self-care. Control group reported deterioration in HRQOL in all dimensions except mobility. There was also reduction in the readmission bed days in study group by 32 days.

Conclusion
This study signals positive effects of the bundled intervention both on reducing 30-day readmission and improving patient's HRQOL. These findings however need further investigation to see if the observed difference persists after the completion of recruitment to the study. If the difference persists then adopting this discharge care bundle as standard of care will benefit patients, healthcare providers and health economy equally. Available evidence does not support using the 30-day metric as a quality measure hence attaching financial penalties to this metric would be unwise and counterproductive. However, 30-day readmission metric could play a vital role in healthcare policy as an accountability tool to improve post discharge care of dialysis patients.

503

Dialysis Unit Emergencies: Challenges of Simulating a Fire Evacuation

Mrs Helen Swanborough[1], Miss Caroline Judge[1], Mr Dominic Modley[1], Mrs Marecel Giron[1]
[1]*East Kent Hospitals NHS Foundation Trust, Canterbury, United Kingdom*

Dialysis Unit Emergencies: Simulating a fire evacuation

Introduction
Our dialysis centre provides haemodialysis across six sites, one central unit and five satellites across a large geographical area. Our dialysis training is delivered through theory sessions, practical skills and simulation training. Due to recent changes, fire training is only provided through e-learning. We have procedural guidance which had not been tested in practice due to these changes. To evaluate whether the procedural guide would be effective, we met with our trust emergency planning team and local fire service to put together a simulated fire evacuation drill.
Method
Our first stimulated fire drill took place in 2016 at the centre unit. The drill was led by the renal nursing team collaborating with the trust's health and safety officer, site co-ordinators porters, switchboard, estates and the out of hours operational leads.
For the purpose of the drill staff were asked to participate as patients. They were given scenarios with information such as: ability to walk, assistance with mobility/ bed bound, type of vascular access, any particular medical symptoms, communication needs or cognitive difficulties. All of which required some amateur acting.
The stimulated evacuation was held in the evening with 10 staff and 20 "patients" to resemble a normal afternoon dialysis shift. The unit was filled with artificial smoke prior to the alarm being raised and the staff proceeded to evacuate the patients as per the theoretical plan. The emergency planning team briefed everyone prior to the evacuation.
Results
The evacuation was a training exercise facilitating learning for the nursing, emergency planning teams and fire service. During the debrief sessions the learning highlighted for the nursing team related to the co-ordination of relocation of patients, the importance of ensuring emergency equipment was to hand and on-going management of vascular access. The key learning for the fire team and emergency planning team was gaining access to the plant room and location of the blue prints of a unit as a casualty was missed. This simulation has influenced changes in practice including the updating of the evacuation procedure.
Discussion
Following the initial evacuation at our centre unit we ran a further session in 2017 to see if lessons learnt from the first evacuation were embedded within the fire, emergency planning and nursing teams. As these simulated evacuations have been of great benefit we held one in the remotest of our satellite units in 2018. This gave different challenges such as being on a second floor with limited out of hours support. Lack of on-site support resulted in delays with the fire team accessing the building and effectively evacuating the patients which meant further adjustments needed to be put in place. This was repeated in 2019 with the agreed adjustments in place.

Implications for Practice
We would like to be able to do this in all our units on a regular basis .Since undertaking this within renal, the trust has recognised that other areas such as theatres would benefit from using simulation training for fire evacuation.

504

Improving Access to Transplantation –A Unit's Experience of Quality Improvement

Mrs Gemma Fox[1], Mrs Kathleen O'Neill[1], Mrs Rachel Gair[2]
[1]Dorset County Hospital, Dorchester, United Kingdom, [2]The Renal Association, Bristol, United Kingdom

Introduction-
Evidence shows that patients who have a prolonged wait for a renal transplant experience poorer outcomes regarding life expectancy and cardiovascular risk than those whose wait is shorter. It is also acknowledged that pre-emptive transplantation is the gold standard. At the KQUIP regional day in October 2018, the South West region of clinicians and patients chose Transplant First as their priority project to address the variation in pre-emptive listing and prolonged time taken to complete the donor and recipient pathways. One of the key aims was for 95% of patients starting or on renal replacement therapy to have a documented transplant status as the starting point for more timely referral. Using the KQUIP methodology this study aims to show how a unit from a referring centre met the national target of 95% patients with eGFR <20 having a documented transplant status.

Methodology-
The South West KQUIP project of Improving Access to Transplantation was chosen in October 2018 at an event comprising multi-professionals, patients and carers. Two multi-professional QI leads from the unit were nominated to lead the project and attended a leadership course with other regional QI leads. KQUIP provided project management, QI training as part of quarterly regional meetings and monthly unit visits. A regional driver diagram was developed with change ideas to meet the overall aim of 'more transplants, faster.' Data was collected using The Transplant First data dashboard with local QI and IT support. The focus was on improving the documentation of transplant status of all patients with an eGFR <20 by using a PDSA approach involving the identification of all patients without a documented status and a plan on how to address this in a sustainable way through multi-disciplinary team meetings, nurse appointments and consultant ownership. The QI leads engaged the wider multi-professional team by communicating the project aims with regular updates of project status.

Results-
Baseline data on documented transplant status on all patients commenced May 2019 and quarterly thereafter. Documented transplant status of all patients with an eGFR of<20 at baseline was 49.3%, increasing to 74.6 % by September and reaching 94.9% in December 2019. (Table 1)

At the same time referrals for transplant assessment also increased. (Table 2)

Conclusion-
By using QI cycles of change, involving the whole multi professional team and the KQUiP framework, documented transplant status has improved over 7 months to reach the national target of 95%. However, we need to ensure that the intervention is sustainable by becoming embedded in practice to maintain this. This is important in order to increase the pre-emptive listing and transplant rates in our centre.
This increase in activity in consideration of patients for transplants from May subsequently led to an increase in referrals to transplant centres.

505

Development of an in-silico cardiovascular model to investigate vascular refilling response during haemodialysis

Mr Thomas Walker[1], Professor Paul Stewart[1], Professor Jill Stewart[1], Dr Latha Gullapudi[2], Dr Beth Lucas[2], Dr Nick Selby[2,3], Professor Maarten Taal[2,3]

[1]Institute for innovation in sustainable engineering, University of Derby, Derby, United Kingdom, [2]Centre for kidney research and innovation, University of Nottingham, Derby, United Kingdom, [3]University of Nottingham / Royal Derby Hospital, Derby, United Kingdom

Introduction:

Intradialytic hypotension (IDH) is a frequent complication affecting around 30% of haemodialysis treatments, however its pathogenesis is not fully defined. We have developed and implemented a novel cardiovascular computer model that incorporates pulsatile flow, arterial and venous dynamics, the baroreflex response, and vascular refilling in order to simulate the effects of dialysis treatments. We use this model to investigate the mechanisms that may contribute to intradialytic instability.

Methods:

We have developed an in-silico model of the cardiovascular system, which acts as a 'virtual' patient receiving dialysis using the MathWorks MATLAB and Simulink packages. The model[1] can be qualitatively described as a lumped-component model, driven by a pulsatile cardiac output that pressurises both pulmonary and systemic vascular beds, and controlled by aortic and carotid baroreceptors through sympathetic and vagal pathways. We have developed an adjustable ultrafiltration and vascular refilling profile that is introduced to the system to emulate dialysis. Physiological properties were parameterised to represent patients with impaired cardiovascular functions such as reduced autonomic function, decreased arterial compliance and dampened baroreflex response. Patients aged >18 years were recruited from our prevalent dialysis population as part of the iTREND (Intelligent Technologies for Renal Dialysis) project, and had continuous non-invasive monitoring of haemodynamics using pulse wave analysis (Finapres NOVA) during dialysis treatment. The reconstructed central aortic waveform allows continuous calculation of a full range of haemodynamic variables that were compared to predictions from our model.

Results:

Our model produces similar intradialytic instabilities when compared to patient data collected during the iTREND study. Outputs of the model include flows, pressures, and volumes throughout the circulatory system, nervous pathway frequencies, and heart rate [figure 1a].
Our extended model has the ability to simulate the general haemodynamic responses of a virtual-patient undergoing simulated dialysis and vascular refill. We have further confirmed that this in-silico model is able to replicate similar pressure waveforms observed in haemodialysis patients as well as haemodynamic changes that would be expected of patients with impaired cardiovascular function [figure 1b].

Conclusions:

The model allows for the control and variation of a large quantity of discrete patient variables to facilitate the investigation of mechanisms that contribute to IDH. We aim to develop the model further in accuracy so

that it can be used to closely replicate a patient's physiological profile, allowing potential future treatments to be trialled first on the patient's 'digital twin'.

506

Intradialytic magnetic resonance imaging for research studies – a dialysis nursing perspective

Miss Kelly White[1,2], Dr Latha Gullapudi[2], Ms Sally Bertram[1], Miss Gillian Pople[1], Mr Brian Ilano[1], Miss Emily Duesbury[1], Mrs Catherine Carter[1], Dr Eleanor Cox[3], Dr Charlotte Buchanan[3], Dr Nicholas Selby[2], Dr Susan Francis[3], Professor Maarten Taal[2]

[1]University Hospitals Of Derby And Burton Nhs Trust, Derby, United Kingdom, [2]Center for Kidney Research and innovation, University of Nottingham, Nottingham, United Kingdom, [3]Sir Peter Mansfield Imaging Centre, University of Nottingham, Nottingham, United Kingdom

Background

Magnetic resonance imaging (MRI) provides the potential to perform high resolution imaging of the heart and brain without the need for intravenous contrast or exposure to radiation. Recent focus on the adverse effects of haemodialysis on cardiac and cerebral function suggests that intradialytic MRI may provide valuable new insights. However, the need to avoid metal objects within the scanner poses a substantial challenge to utilising MRI during dialysis. Here we describe the method we have developed to overcome these practical barriers and discuss our experience during a recent clinical trial from a nursing perspective.

Methods

We enrolled patients who were stable on chronic maintenance haemodialysis. Patients took part in a cross-over trial comparing changes in dialysate temperature, and as part of this underwent two study days in which multi-organ MRI scans were performed before, during and after dialysis. The MRI centre at the local university has a specifically designed unit able to perform MRI scanning during haemodialysis sessions. The dialysis machine is placed outside the MRI scan room and because the scanner room is shielded, the dialysis lines have to pass through a specific opening (waveguide) in the wall. This requires the use of long dialysis lines (2m). Water supply and drainage are positioned so that the dialysis machine can be as close to the external opening of the waveguide as possible. Non-metallic needles (silicone) were used for needling the fistula using the button-hole technique. A small team of nurses were trained in the use of non-metallic needles and thermocontrolled dialysis. For intradialytic MRI scans, a dialysis nurse or doctor remained inside the scanning room to monitor the patient and a technician remained outside the room to operate the dialysis machine. A doctor was present throughout the study day, who performed a detailed clinical assessment before and after dialysis. Between scan sessions, participants were moved from the MRI scanner to an MRI-safe trolley for comfort, while dialysis continued. Transport was arranged to and from the MRI centre and refreshments were provided during the long study days (8-9h).

Results

For this study 17 patients were recruited; two patients were transplanted mid-way through the study, two patients were withdrawn due to symptomatic intradialytic hypotension and one was withdrawn for medical reasons. There were some technical challenges including failure to cannulate (one participant) and MRI scanner fault (one participant) which meant we had to abandon the day and start the run-in period again. Most participants experienced no adverse events and we were able to successfully complete the protocol in twelve to achieve the recruitment target.

Conclusion

We have developed a method to safely perform intradialytic MRI which shows promise to improve understanding of the cardiac and cerebral impact of haemodialysis. Renal dialysis and research nurses were vital members of the larger team who supported dialysis treatments in this environment.

507

Is there an IBD related nephropathy?

Dr Heidy Hendra[1], Prof Alan D Salama[1]
[1]*UCL Centre for Nephrology, Department of Renal Medicine, Royal Free London NHS Foundation Trust, London, United Kingdom*

Introduction/ Case study
Extraintestinal manifestations are observed in 6 – 46% of patients with inflammatory bowel disease (IBD)[1]. Tubulointerstitial nephritis (TIN) is a known side effect of 5-aminosalicylicacid (5-ASA), the treatment widely used in IBD. However, there are some reports of IBD patients diagnosed with TIN in the absence of exposure to this medication. Most cases reported an association with Crohn's disease and only a few observed a connection with ulcerative colitis (UC). We report a case of a 25-year-old female patient who had biopsy-proven TIN with no significant precipitant identified apart from 6-months history of Oxytetracycline intake two years previously. During a routine testing she was found to have creatinine of 150 µmol/L and mild hypertension with a blood pressure of 149/88 mmHg. Urine analysis showed 2+ blood and no protein. Renal biopsy showed chronic parenchymal damage with probable "smouldering" active interstitial nephritis. Colonoscopy was performed due to rectal bleed and high daily frequency of bowel movement for some years, which showed chronic pancolitis in keeping with UC. Our patient did not respond to steroids alone, but mycophenolate mofetil (MMF) and increased dose of steroids improved her renal function as well as controlling the colitis. Her gastrointestinal symptoms remained unchanged following steroid wean. This case prompted us to look further into our cohorts to determine if there was evidence for an IBD-associated nephritis.

Methods
A retrospective analysis was performed on 426 patients in our database diagnosed with inflammatory bowel disease. We investigated those patients who had undergone renal biopsy and reviewed their case records.

Results
Renal biopsy was performed in 61 patients and the following diagnoses were found: acute interstitial nephritis/ tubulo-interstitial disease was the commonest in 18 patients (29.5%) of which 3 had granuloma, followed by IgA nephropathy in 11 patients (18%), while the rest were an assortment of other diagnoses, but included 5 (8%) with multicompartment chronic damage (Figure 1). The distribution between Crohn's and UC was 52.5 % vs. 47.5% respectively, and 35/61 were female. Out of 18 patients with TIN, 13 (72%) were taking 5-ASA compounds at the time of biopsy. Of the remaining one had possible antibiotic related TIN and one was subsequently diagnosed with sarcoidosis. Three of the TIN had granuloma, one with renal tuberculosis following a positive AFB in the biopsy, one was the patient with sarcoid and the other of unknown aetiology. Therefore 3/18 (17%) patients were diagnosed with TIN prior to initiation of treatment with no other obvious precipitants.

Discussion
Tubulointerstitial disease and IgA nephropathy were the commonest renal diseases in our IBD cohorts; occurring mostly in Crohn's patients, similar to other reports.[2] The TIN is often thought to be secondary to 5-ASA containing compounds, however, 17% of TIN cases had no clear drug association and 8% of biopsy cases had multicompartment chronic damage of unknown aetiology, raising the possibility of an IBD associated renal pathology. In addition, this report is a further case association between UC and TIN which appears to be less common.[3,4,5]

508

Pregnancy in women with nephrotic-range proteinuria

Dr. Shuli Svetitsky[1], Professor Liz Lightstone[1,2]
[1]*Imperial College Healthcare NHS Trust Renal and Transplant Centre, Hammersmith Hospital, London , United Kingdom,* [2]*Centre for Inflammatory Disease, Division of Immunology and Inflammation, Faculty of Medicine, Imperial College London, London, United Kingdom*

Introduction

The adverse effects of chronic kidney disease (CKD) on pregnancy and pregnancy on renal function have been described, but the effect of severe proteinuria in early pregnancy is not known. The aim of this study was to evaluate the obstetric and renal outcomes of pregnant women with severe proteinuria manifesting in early pregnancy.

Methods

We retrospectively assessed the records of 550 women with renal disease who were cared for during pregnancy in Queen Charlottes and Chelsea hospital between January 2008 to October 2018 and identified women with nephrotic range proteinuria in early pregnancy, defined as protein to creatinine ratio (uPCR) of >300 mg/mmol, or +3 protein on urine dipstick analysis with a later uPCR of >300. Their records were reviewed and outcomes were compared to women with CKD and little or no proteinuria in early pregnancy.

Results

We identified 37 women with severe proteinuria and compared them with 62 women with CKD but who had mild or no proteinuria. The baseline eGFR and blood pressure in the groups were similar. There were significantly more women with a diagnosis of glomerular disease in the group with proteinuria. Of the proteinuric group, 8/37 (21%) presented in pregnancy with new onset renal disease.
The group with severe proteinuria had significantly higher rates of delivery by C-section, and higher rates of prematurity including severe prematurity (<34 weeks). They had lower average birth weight (BW), with an average BW of 2,213 gr (± 905) as opposed to 2,753 gr (±720). In the proteinuric group, 10% of the babies were born with very low birth weight of <1,500 gr, as opposed to only 3% in the non-proteinuric group. Their renal outcomes were poorer, with a lower eGFR at 3 years and a higher rate of advanced CKD and renal replacement therapy.
In the women with proteinuria, the level of scarring on a recent renal biopsy was found to be a significant predictor of several poor outcomes, including premature birth and developing advanced kidney disease.

Conclusion

Severe proteinuria early in pregnancy is associated with lower birth weight, greater prematurity and poorer renal function in the long term. Physicians treating these women must be aware that they are at a higher risk of complications than women with renal disease without severe proteinuria.

509

Diagnostic accuracy of existing AVF function criteria in assessing functional dialysis use.

Ms Chloe Rai[1], Ms Heidi Jimenez[2], Ms Tamsin Stevenson[2], Mr Teun Wilmink[1], Prof Indranil Dasgupta[2,3], Mr Maciej Juszczak[1,4]

[1]Department of Vascular Surgery, University Hospitals Birmingham Nhs Foundation Trust, Birmingham, United Kingdom, [2]Department of Renal Medicine, University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [3]University of Warwick, Coventry, United Kingdom, [4]Institute of Inflammation and Ageing, University of Birmingham, Birmingham, United Kingdom

Introduction

SONG HD patient and physician surveys on research in vascular access demonstrated strong preference for outcomes demonstrating fistula use for dialysis. We previously proposed a pragmatic definition of a functional fistula (Functional Dialysis Use; FDU) as six consecutive, successful cannulations of AVF with two needles to deliver prescribed dialysis. Assuming usual three dialysis sessions per week, this is an equivalent of two weeks of uninterrupted use of the AVF1. Current clinical and ultrasound assessment criteria focus on patency rates and variably defined usability of AVF for dialysis. In this project we assessed diagnostic accuracy of four assessment methods (Clinical judgement (HDREADY), "Rule of 6s'" (ROSx), University of Alabama (Birmingham) Ultrasound Criteria (UAB) and SONAR study criteria) in identifying fistulas that meet the criteria for FDU.

Methods

This audit was part of a quality improvement project within the renal access service. Consecutive patients with newly formed AVF between 01/10/2016 and 31/03/2019 were followed up in the renal access clinics 6 weeks from the time of surgery. Fistulas were assessed clinically (inspection and palpation). Where the ultrasound was part of the follow-up clinic, the diameter, depth and flow in the AV fistula were assessed. Diagnostic accuracy against FDU was assessed by calculating Sensitivity, Specificity, Positive (PPV) and Negative Predictive Values (NPV) and compared using McNemar's test. ROC curves were drawn, and AUC calculated and compared using bootstrap method. Method agreement was assessed using Fleiss kappa for multiple, and Cohen's kappa for binomial comparisons.

Results

Two hundred and eighty-three patients underwent AVF formation during study period. The median age was 65.0 [54.0,75.5] and 171 (60.4%) were male. Diabetic nephropathy was the primary renal diagnosis in 146 (51.6%) cases. One hundred and seventy-four (61.5%) AVFs were radio-cephalic, 94 (33.2%) were brachio-cephalic, and 15 were categorised as 'other' (brachio-basilic, ulno-cephalic, radio-basilic).

There was no difference in the distribution of patient characteristics and outcomes (FDU, assisted FDU, failure of FDU, non-use) between those patients who attended the ultrasound clinic (n=111) and those who did not (n=172).

The diagnostic accuracy was analysed in patients followed up in the ultrasound clinic. Patients with unknown FDU status (n=23) and primary failure (n=5) were excluded.

Ultrasound-based criteria had similar diagnostic accuracy as clinical judgement but greater than Rule of 6s. However, the differences were not statistically significant (Table 1). SONAR criteria performed best with the highest AUC (0.79). PPV and NPV were similar for US-based criteria and clinical judgement. There was fair-to-moderate agreement between all methods, with almost perfect agreement between ultrasound-based criteria.

Discussion

We demonstrated statistical equivalency between all assessment methods, however SONAR criteria seemed to perform better than other assessment methods. A relatively small sample size, and single ultrasound operator (reproducibility of measurements) limit generalisability of our findings precluding any recommendations. However, AVFs that did not achieve the threshold for FDU according to SONAR criteria may benefit from closer surveillance to support maturation and prevent fistula failure.

Fig 1. Comparison of ROC curves for four diagnostic methods.

Tab 1. Diagnostic accuracy of four methods of fistula assessment.

510

Annual burden of emergency hospital admissions for patients on Renal Replacement Therapy (RRT) in England – GIRFT analysis of linked UK Renal Registry (UKRR) and Hospital Episodes Statistics (HES) data over a 5 year period 2013-2017.

Dr Javeria Peracha[1,2], Mr David Pitcher[1], Mrs Retha Steenkamp[1], Dr James Medcalf[1,3], Professor Dorothea Nitsch[1,4], Dr Graham Lipkin[2], Dr William McKane[5]

[1]UK Renal Registry, Bristol, United Kingdom, [2]University Hospitals Birmingham NHS Trust, Birmingham, United Kingdom, [3]University Hospitals Leicester NHS Trust, Leicester, United Kingdom, [4]London School of Hygiene and Tropical Medicine, London, United Kingdom, [5] Sheffield Kidney Institute, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom

Background/Aims:

Emergency Hospitalisation (EH) in RRT patients is associated with significant financial costs to the healthcare system and emotional cost to patients and caregivers. The annual EH rate for prevalent RRT patients in England is currently unknown. Using linked HES and UKRR data, we aim to describe trends in EH amongst RRT patients between 2013-2017, patterns of demography, centre variation and most common primary coded diagnoses.

Methods:

Prevalent haemodialysis (HD), peritoneal dialysis (PD) and transplant patients in England on 01/01/2017 were identified using UKRR database and EH during the subsequent year extracted from HES. All planned/elective and day case admissions were excluded from analysis. Primary coded diagnosis was taken from final episode of each admission.

Kaplan-Meier curves were plotted from 01/01/2017 to date of first EH for patients on each RRT modality, censoring at date of RRT modality change or death. Cox proportional hazards models were used to calculate hazard ratios (HR) for admission associated with demographics (age, sex, ethnicity, social deprivation (IMD)). Bed nights per RRT patient were compared across all renal centres.

Above analysis was repeated for prevalent RRT patients in each year between 2013-2016 inclusive, to investigate for temporal trends.

Results:

There was little variation in annual results (2013-2017) therefore only 2017 results are presented here.

On 01/01/2017 there were 21,097 people registered on HD, 3,071 on PD and 27,488 with a kidney transplant. During 2017, approximately half of all dialysis patients and a fifth of transplant patients had at least one EH (51% HD, 52% PD, 22% transplant) (Figure 1). Just under a third of all dialysis patients and a tenth of transplant patients had more than 1 EH (27% HD, 30% PD, 9% transplant).

The total burden of emergency bed nights for RRT patients in England was 235,142 HD, 33,331 PD and 94,200 transplant. Average emergency bed nights per RRT patient at 51 English renal centres varied considerably (6-18 HD, 2-25 PD, 1-8 Transplant).

Analyses, with adjustment for demographic features, confirmed that dialysis patients were three times more likely to have an admission than transplant patients and patients on PD had a slightly higher risk of admission those on HD. Age over 60, Asian and Caucasian ethnicity, female gender and social deprivation where all risk factors for admission, with persisting difference between RRT modalities (Table1).

Commonly coded primary diagnoses for dialysis patients included CKD (16% HD, 22% PD) and access related complications (13% HD, 23% PD). Respiratory infections were a large group across RRT modalities (15% HD, 16% PD, 11% transplant). Other commonly coded diagnoses included 11% PD peritonitis and in transplant patients; UTI (10%) and AKI (7%).

Discussion:

There is a high burden of EHs for RRT patients each year, particularly in patients on dialysis. Considerable variation is observed in centre level admission rates and further work is still required to understand why this is the case.

CKD is commonly coded as primary diagnosis in hospitalised RRT patients, masking the real cause for admission and highlighting the need for improvement in clinical coding practice.

511

Investigating the role amphiregulin in kidney defence and repair

Dr Kevin Loudon[1,2], Dr Alexandra Riding[1,2], Dr John Ferdinand[1], Dr Benjamin Stewart[1,2,3], Professor Menna Clatworthy[1,2,3]

[1]Molecular Immunity Unit, MRC Laboratory of Molecular Biology, University Of Cambridge, Cambridge, United Kingdom, [2]Cambridge University Hospitals NHS Trust, Addenbrooke's Hospital, Cambridge, United Kingdom, [3]Wellcome Sanger Institute, Hinxton, United Kingdom

Background: Urinary tract infections (UTI) are common and cause significant morbidity[1]. Most infections are caused by uropathogenic Escherichia coli (UPEC) and recurrent pyelonephritis can lead to scarring and chronic kidney disease[1].

Tissue resident immune cells, including mononuclear phagocytes (MNPs) play an important role in defence against infections by internalising invading bacteria and recruiting neutrophils[2 3]. In addition, they may promote epithelial integrity and repair, for example by secreting the epidermal growth factor receptor ligand Amphiregulin (AREG)[4]. AREG has been shown in a number of models to be critical for both inflammation and repair however little is known of its role in the kidney[5].

Aims: To determine AREG expression in human and mouse kidney, including the anatomical distribution and cellular source. To ascertain whether AREG plays a role in defence against UTI and in susceptibility to kidney fibrosis.

Methods: Human kidney samples were processed for bulk[8] and single cell RNA sequencing[9 10]. In vitro studies were performed using an immortalised human proximal tubule cell line (HK-2) and monocyte-derived macrophages (MDM). An in vivo model of acute and chronic UTI was performed in C57BL/6 (WT) or Areg-/- mice.

Results: In human kidneys we observed higher AREG expression in the medulla compared to the cortex. Single cell RNA sequencing demonstrated that MNPs in both human and murine kidneys expressed AREG and this was confirmed by flow cytometric analysis. In vitro MDMs secreted AREG following exposure to UPEC. Recombinant AREG in vitro promoted both HK2 survival and repair in the presence of UPEC. In vivo, Areg-/- mice had increased susceptibility to pyelonephritis with reduced numbers of polymorphonuclear neutrophils, newly recruited Ly6C hi / MHCII lo monocytes and transitioning Ly6C int / MHCII int macrophages compared to controls. RT-qPCR of infected kidneys revealed reduced Ccl2 transcripts in Areg-/- mice.

In recurrent / chronic UTI, WT mice demonstrated higher transcripts of Areg and fibrosis-associated genes Col1a1 and Fn1 compared to controls; these were also highest in the medulla/pelvis region. Areg-/- mice showed less fibrosis ($p<0.001$) compared to controls by Sirius Red staining and RTqPCR following chronic UTI. Areg-->WT bone marrow chimeras also demonstrated less fibrosis compared to WT-->WT.

Conclusion: AREG expression is highest in the renal medulla and MNPs are a major source of AREG. Our data show that AREG contributes to defence against pyelonephritis in vivo, and this may be in part by promoting circulating monocytes recruitment to the kidney by enhancing Ccl2-production by epithelial cells. AREG production as well as fibrosis related genes are increased in the context of UTI-induced kidney fibrosis and these findings are abrogated in Areg-/- animals. While experiments are still ongoing AREG may potentially offer a future therapeutic target in CKD.

512

Lower limb amputation within 5 years of commencing dialysis for patients in England: GIRFT retrospective analysis of linked Renal Registry and Hospital Episode Statistics data 2001-2017

Dr Javeria Peracha[1,2], Mr David Pitcher[1], Mrs Retha Steenkamp[1], Dr James Medcalf[1,3], Professor Dorothea Nitsch[1,4], Dr William McKane[5], Dr Graham Lipkin[2]

[1]UK Renal Registry, Bristol, United Kingdom, [2]University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [3]University Hospitals Leicester NHS Trust, Leicester, United Kingdom, [4]London School of Hygiene and Tropical Medicine, London, United Kingdom, [5]Sheffield Kidney Institute, Northern General Hospital , , United Kingdom

Background/ Aims:

Renal dialysis is a recognised risk factor for lower limb amputation (LLA). Exact rates and risk factors associated with LLA in dialysis patients in England have not previously been described. The aim of this study was to establish the incidence of LLA in the first 5 years of receiving dialysis in England. We compared three groups of patients, defined at RRT start - patients reported to have "diabetic nephropathy" (DN), "diabetic others" (DO) and "non-diabetic" (ND) patients. We also investigated for any centre variation in incidence of amputations.

Methods:

Retrospective analysis of linked 'UK Renal Registry' (UKRR) and 'Hospital Episode Statistics' (HES) data was undertaken for incident dialysis (haemodialysis and peritoneal dialysis) patients between 2001-2012 in England.

Demographic data at dialysis start (age, gender, ethnicity, index of multiple deprivation (IMD)) and co-morbidities (diabetes, ischaemic heart disease (IHD) and peripheral vascular disease (PVD)) were extracted from the UKRR and/or HES databases. Date of first 'minor' (toe/foot/ankle) or 'major' (above/below knee) amputation in the 5 years after dialysis start was identified. Kaplan-Meier plots were created to illustrate incidence of amputations in 3 groups of interest (DN, DO, ND). Patients were censored at transplantation, death or recovery of renal function. Hazard ratios were calculated using Cox proportional hazards model and were adjusted for age, sex, ethnicity, IMD quintiles, PVD, IHD, and calendar year. Parameter estimates from this adjusted model were used to investigate centre-level variation.

Results:

There were 54,931 incident dialysis patients 2001-2012 (Median age 65 years, 62% males, 80% Caucasian, 26% most deprived IMD quintile). The proportion of patients in each study category was: DN 25%, DO 10%, ND 65%.

2.4% of patients had already had an amputation prior to dialysis start (DN 7.38%, DO 2.42%, ND 0.37%). The proportion of patients with amputations in 5 years following dialysis start were DN 12.4%, DO 4.7% and ND 0.9%. The incidence rates (amps/100 dialysis patient years) were ND 0.35, DO 1.82 and DN 4.45.

(Figure 1) shows the incidence of amputations throughout the 5-years. Age, gender, ethnicity, IHD and PVD were all significant risk factors for amputation (Table 1).

Adjusted individual renal centre rates of amputation within five years varied between 7.5 amps/100 DN patients to 27.0 amps/100 DN patients and four centres were above the 99.9% confidence limits suggesting there is unexplained variation beyond the variables adjusted for.

Discussion:

Our findings demonstrate the high risk of LLA in dialysis patients with diabetes, with the highest risk group being those who are known to have diabetic nephropathy. Male gender, Caucasian ethnicity, age 40-59 years, a history of PVD and, to a lesser extent, of IHD are all associated with additional risk. Increased amputation risk in Caucasian patients has also been reported in non-renal amputation literature and may be linked with factors such as smoking status. There appears to be considerable national variation in amputation rates for patients with diabetic nephropathy and this may be linked to local availability of high quality foot care for diabetic patients.

513

Corporate Social Responsibility - Revamping protocols and changing practice to promote ethical sustainable responsible business in haemodialysis.

Miss Laura Thompson[1]
[1]*South Tyneside And Sunderland Foundation Trust, Sunderland, United Kingdom,* [2]*SIGNhd, National Collaborative,*

By 2030 The NHS Framework for Sustainable Development sets out to support 9 of the 17 United Nation's Sustainable Development Goals (SDG's).

The renal service provides haemodialysis (HD) to patients in the North East. The department currently has 88 HD machines in use across 3 HD units and a renal ward.

The department has started to review it's protocols to support smarter working and one example of this is to reduce water consumption. Old protocols do not always tally with advances in machine design. It was discovered that the organisation was carrying out unnecessary machine disinfection at the start of each day and therefore wasting 1.8 million litres of clean drinking water each year, also, pouring 3000 litres of Citrosteril machine disinfectant into the water drainage systems and subsequently the environment.

Waste reduction includes a range of measures to prevent and reduce waste. The review of one protocol led to discussions around machine isolation.

Modern HD machines do not require isolation between use. The emphasis should be on how the external surfaces of the machine are thoroughly cleaned using appropriate / recommended solutions. Renal engineers can be called out to repair isolated machines when isolation is not necessary, this is a further waste of department resources and unnecessary treatment delays.

Our new generation of renal patients and staff are the key stakeholders of the organisation. They are more focused and engaged on how services can work smartly in responsible consumption and production to reduce waste and harm to the environment. By a simple review of 1 protocol we can demonstrate change that is beneficial to the environment reducing harm and saving water. The journey continues.

514

English transplant centre variation in early (30 day) and late (365 day) readmission rates following renal transplantation – a UK Renal Registry and GIRFT analysis of Hospital Episode Statistics (HES)

Dr Javeria Peracha[1,2], Mr David Pitcher[1], Mrs Retha Steenkamp[1], Dr William McKane[3], Dr Graham Lipkin[2]
[1]UK Renal Registry, Bristol, United Kingdom, [2]University Hospitals Birmingham NHS Trust, Birmingham, United Kingdom, [3]Sheffield Kidney Institute, Northern General Hospital, Sheffield, United Kingdom

Background:

Emergency hospital readmission (EHR) rates following surgical procedures are widely used as a quality of care metric due to associations with avoidable morbidity and the additional financial cost to the healthcare system and emotional burden for patients and caregivers.

Aims:

In this study we aim to establish, for the first time, EHR rates following adult renal transplantation in England, in a national contemporaneous cohort. An attempt has been made to asses for variation in EHR rates between recipients of live donor (LD) and deceased donor (DD) kidneys, between 19 English renal transplant centres and to identify risk factors for readmission.

Methods:

Adult kidney transplant recipients in England 2012-2016 and their EHR post transplantation (0-365 days) were identified using English, Hospital Episode Statistics (HES). All planned/elective admissions and those with a length of stay<1 day were excluded from analysis.

The proportion of patients with first EHR early (0-30 days) and late (0-365 days) post-transplant were compared for recipients of DD and LD kidney transplants (chi squared/t-test). Additionally, we calculated the proportion of patients with multiple (≥2) EHR and the mean EHR bed nights per transplant recipient nationally and at individual renal transplant centre level. Centre level EHR rates were adjusted for age and sex to allow comparison between units.

Additional patient demography was extracted from data linkage to the UK Renal Registry (UKRR) and logistic regression was used to calculate odds ratios for admission risk associated with these demographic factors.

Results:

There were 8,072 DD and 3,729 LD kidney transplants between 2012-2016.

Proportions of patients with an EHR were: 0-30 days (23%DD vs 22%LD, p=0.17), 0-365 days (58%DD vs 50%LD, p<0.0001) and multiple readmissions 0-365 days (33%DD vs 25% LD, p<0.0001). Mean EHR bed nights in England were 10.2 (95% CI, 9.7 - 10.6) per DD recipient and 6.1 (95% CI, 5.6 - 6.5) per LD recipient.

Age/sex adjusted readmission rates (0-365 day) varied considerably between centres from 37%-76% DD recipients and 43%–79% LD recipients (Figure 1). Mean bed nights per transplant recipient also varied considerably between units, 5.2-15.5 for DD recipients and 3.3-9.3 for LD recipients.

Risk Factors for admission included age over 60, female sex and social deprivation (Table 1).

Discussion:

In this analysis of almost 14,000 contemporaneous adult recipients of a renal transplant, one in 5 adult renal transplant recipients in England require EHR within 30 days of their surgery and over half will have at least one EHR within the first year post transplant.

Recipients of DD and LD kidneys had similar EHR rates by 30 days but by 365 days recipients of a DD kidney had a higher EHR rate. Female sex, age over 60 and social deprivation are all risk factors for admission.

There appears to be a centre effect impacting upon EHR. Patient and transplant level factors should be further explored, alongside individual transplant unit care pathways and outpatient follow up intensity to allow better understanding of factors underlying this variation and how services might best reduce emergency post renal transplant readmissions.

515

Assessment of patient sensitivity to exit site dressing on central venous catheters, on a maintenance dialysis unit.

Mrs Julie Jackson[1], Mrs Deborah Worthington, Mrs Lisa Morris, Mrs Ethel Boongaling, mrs Mercy Mathew, Mrs Shyni Mathew, Mrs Amy Greenwood, Mrs Maureen Naylor, mrs Janet Walker, mrs Urszula Koniecko, mrs Anna Ely
[1]*Salford Royal Foundation Trust, Greater Manchester, United Kingdom*

Following review of all patients who dialysed using CVC, we identified there was a group of patients npn concordant with catheter care. The main reason was identified as intolerance or allergy to either the cleaning preparation or the dressings recommended.

We therefore sought to establish if true allergic reaction/intolerance was occurring occurs in these patients.

A small pilot QI project was developed. Our local guidelines recommend the cleaning preparation is a ChloraPrep 2%w/v/70% cutaneous solution with a clear dressing.

The pilot followed three steps:

No 1: A Tegaderm IV Advanced dressing was placed on the opposite side to the CVC. It was left in situ during the dialysis session and assessed for redness or irritation. If none was noted, the dressing was left until the next dialysis session. It was then assessed by both the patient and staff for any reaction.

No 2 ChloraPrep 2%w/v/70% cutaneous solution was next used on the skin opposite the CVC and the area was monitored by both staff and the patient for any reaction during their HD session. Full air drying was carefully observed.

No 3 The skin area opposite the CVC was cleaned with ChlorPrep 2% and then cover with the Tegaderm dressing; this was left in situ until the next dialysis session. Again, any reaction was evaluated by both the patient and staff member.

The results showed interestingly, out of the six patients in the pilot, only one patient showed a true allergic reaction to both the cleaning preparation and the dressing. For this patient, and in consultation with the infection control department, the consultant and senior nurses, a specific plan for management of the CVC was developed.

In the other 5 cases, there was no reported reaction to either dressing or cleaning preparation. In discussion with each of the other patients, and explaining the superior infection risk reduction using ChlorPrep 2%, they were all happy to follow our standard ANTT CVC cleaning and dressing guideline.

This is a simple pilot with a small cohort of patients but produced conclusive results. We have now rolled this out to the other units in our network

An unexpected outcome was the engagement of the patient at all stages of the process and allowed for education and involvement. This encouraged the patients to become more involved in their decision making.

From this piece of work, the process of establishing true sensitivity has been extended to all units in the group.

Reference:

Long term indwelling HD catheter care treatment and prevention of exit, tunnel and blood stream infection guidelines. Classification: Clinical Guideline Lead Author: Dr Janet Hegarty, Consultant Nephrologist Additional author(s): Dr Adam Jean, Microbiologist, Jude Allen Renal Pharmacist, Sr Carol Howard Infection Control Nurse, Sr Yvonne McGee Renal Unit Manager Authors' Division: Division of Renal Services Unique ID: DDCRen01(17)Issue number: 1.1Expiry Date: May 2019 (Extended till Dec 19) 1st extension.

516

Disseminated Trichosporon infection in a cardiac and renal transplant recipient - presenting as skin lesions mimicking calciphylaxis

Dr Javeria Peracha[1], Sister Jill McCready[1], Dr Aimee Johnson[1], Dr Mohammed Afzal[1], Dr Miruna David[1], Dr Ser-Ling Chua[1], Mr Andrej Kidess[1], Mr Jorge Mascaro[1], Dr Sern Lim[1], Dr Graham Lipkin[1], Dr Miriam Berry[1]
[1]*University Hospitals Birmingham NHS Trust, Birmingham, United Kingdom*

Here we present the unusual case of a 53 year old female with a previous cardiac transplant (for dilated cardiomyopathy) and recent renal transplant (for polycystic kidney disease), complicated by delayed graft function, for which she was still receiving intermittent haemodialysis.

She was re-admitted to hospital soon after her initial post-operative discharge with cellulitis of her right thigh, which rapidly progressed to involve both lower limbs. The lesions were excruciatingly painful and developed focal areas of necrosis and skin breakdown, mimicking calciphylaxis (figure 1). A decision was made to biopsy the lesions and this revealed a surprising diagnosis of disseminated "Trichosporon inkin" infection.

Further imaging revealed a large mycotic aortic aneurysm, at the anastomotic junction of her cardiac transplant and localised leptomeningeal disease in the right frontal lobe of the brain. The patient also developed acute loss of vision in one eye due to fungal endophthalmitis and subsequent rhegmatogenous retinal detachment.

We managed this lady with minimisation of immunosuppression (low dose tacrolimus and steroids only) and 3 months treatment with combination anti-fungal agents (Ambisome, voriconazole and flucytosine). She required surgical excision and repair of her aortic aneurysm and a vitrectomy for her retinal detachment.

Surprisingly, given the extent of systemic involvement, we were able to successfully treat the disseminated Trichosporon infection. The patient is now independent of dialysis and has no signs of cardiac transplant rejection. She continues on lifelong oral voriconazole to prevent a recurrence of her infection and is monitored regularly through serum fungal markers.

There are only 3 previously reported cases in recipients of solid organ transplants (1 in a kidney transplant recipient). The prognosis is usually extremely poor with high mortality.

This case illustrates the important role of skin biopsy for patients with suspected calciphylaxis as the differential diagnosis is broad and includes potentially treatable infections.

517

Eculizumab in pregnant patients with Atypical Haemolytic Uraemic Syndrome (aHUS)

Mrs Lisa Batchelor[1], Dr Kate Smith-Jackson[1], Dr Vicky Brocklebank[1], Mrs Angela Watt[1], Dr Michal Malina[1], Dr Sally Johnson[1], Professor Neil Sheerin[1], Dr Edwin Wong[1], Professor David Kavanagh[1]
[1]*National Renal Complement Therapeutics Centre, Newcastle Upon Tyne, United Kingdom*

Background
Atypical HUS is associated with mutations in the complement genes: CFH; CFI; CD46; C3 and CFB. These genetic mutations are not causative but are instead predisposing with aHUS unmasked by triggers such as infection or pregnancy. Historically the outcome of aHUS at the initial presentation was very poor, as were outcomes after kidney transplantation. The treatment of aHUS with Eculizumab has revolutionised the outcome for patients. Pregnancy and the post-partum was a particular risk period for aHUS however Eculizumab treatment has now been used in aHUS patients through pregnancy
Aim
The aim of this study was to analyse the UK experience of Eculizumab treatment in pregnant aHUS patients
Findings
Since the initiation of the national specialised aHUS service commissioned by NHS England in April 2013 ~750 individuals have been referred with suspected aHUS. 178 were females of child bearing age with 81 receiving Eculizumab treatment. In those who became pregnant on Eculizumab monitoring of AH50/CH50 demonstrated loss of complement blockade from the second trimester onwards requiring an increase dose of Eculizumab. Around 66% of pregnancies went to full term delivering a healthy baby; ~33% of pregnancies had pre-eclampsia/foetal loss despite adequate complement blockade.
Conclusion
Pregnancy was historically considered impossible in patients with aHUS due to poor outcomes to both mother and baby. Eculizumab is now used to facilitate successful pregnancies. Complement blockade should be monitored from the 2nd trimester onwards and Eculizumab should be increased to ensure adequate complement blockade. We report no known congenital abnormalities in the babies born to women receiving Eculizumab in this cohort. These patients are at high risk for pre-eclampsia because of their history of previous acute kidney injury and clinical or subclinical chronic kidney disease. Although some animal and clinical data have suggested a link between pre-eclampsia and complement activation, in clinical practice C5 blockade does not prevent pre-eclampsia in patients with aHUS.

518

Change in haemodialysis intravenous iron preparation increases care quality

Dr Manvir Kaur Hayer[1], Mrs Jo Hollingworth[1], Alice Gray[1], Jasmeen Kang[1], Raja Muhammad Rashid[1], Lee Hollingworth[1], Dr Stephen John[1]
[1]*Heartlands Hospital, Birmingham, United Kingdom*

Introduction

Iron deficiency is common in the dialysis population and IV iron administration has become standard care in managing renal anaemia. NICE guideline NG8 (2015) 'Chronic Kidney Disease: managing anaemia' recommends testing CKD patients to diagnose iron deficiency and determine potential responsiveness to iron therapy and long-term iron requirements every 3 months (every 1-3 months for patients receiving haemodialysis). Locally-developed guidelines recommend the dose and frequency of iron to be given to patients based on haemoglobin (Hb) and percentage (%) of hypochromic red blood cells. Our service changed IV iron preparation (from iron sucrose "Venofer" (IS) to iron isomaltoside 1000 5% "Diafer" (ISM) in 2018. We therefore retrospectively audited practice to: 1) determine how treatment with ISM maintains patients within the Hb target range (100-120 g/L), 2) examine whether or not the doses of erythropoietin stimulating agents (ESAs) changed over time following a switch from IS to ISM, 3) assess whether ISM was cheaper than IS and 4) understand both patient and staff experience with ISM compared to IS.

Methods

We reviewed data from 2 satellite units, by extracting data from our local Renal IT system: age, gender, weight, Hb, ferritin, transferrin saturation (TSATs), mean corpuscular volume (MCV), mean corpuscular haemoglobin concentration (MCHC), % hypochromic red blood cells (RBCs), IV iron and ESA use for all patients (n=124) in the 5 months before and 5 months after change-over in IV iron formulation.

Results

Average age was 66+/-13 years, 55% male. There was no change in Hb control (% with Hb 100-120g/L, 74% to 81%, p=0.291). This was not related to any increase in ESA use, as the average dose of ESAs was not statistically different between the two iron formulations (p=0.116). There was a higher median dose of ISM prescribed compared to IS (median 80mg vs. 40mg per patient, p=0.012) Markers of iron status were similar with both treatments. Over the 5-month course of the audit, ISM costs were higher by £729.80 but when nursing time reduction was included this reduced to £120.41, equating to an extra £24.08/month (<1% increase). Finally, patients and staff reported a more positive experience when using ISM compared to IS. Whilst no adverse events were reported with either IV iron formulation, 9 minutes of nursing time was saved per session and there were no reports of altered taste (metallic) in patients administered ISM.

Discussion

ISM use was associated with a stable proportion of patients who maintained their Hb within the target range. ISM costs were higher than IS, but ease of use saved on nursing time, encouraging adherence to the local medicine policy, enabled administration of iv iron without distraction and observation of patients throughout the duration of administration. ISM was associated with a better patient experience without

altered metallic taste after ISM administration. Importantly, no adverse events were reported. On balance, the small increase in cost was felt to be outweighed by the improved staff and patient experience.

519

The case for a renal transplant Dietitian

Dan Griffith[1], Sara Price[1]
[1]*University Hospital Birmingham, Queen Elizabeth Hospital, Birmingham, United Kingdom*

Intro
Post-transplant diabetes affects 15-20% of renal transplant patients and affects morbidity and mortality of the transplanted kidney and the patient1. Dietary freedom following potentially years of dialysis restrictions may contribute to weight gain and incidence of post-transplant diabetes3. Furthermore, medications such as corticosteroids are associated with weight gain and raised triglycerides post-transplant2. NICE guidance has suggested that the involvement of a Registered Dietitian (RD) post-transplant may contribute to the longevity of the transplant and be cost-saving downstream4. However RD's do not form a regular part of post-transplant care for renal transplant recipients.

Methods
199 renal transplants were performed between 01/01/2017 to 10/01/18 in centre. Patients who passed away, had a failed transplant or transferred out of centre within 1 year of transplant were excluded, leaving 125 transplant patients.
Pre-transplant weight and highest weight post-transplant were collected. For patients who had lost weight, their lowest weight post-transplant was recorded. Pre- and post-transplant data was also collected for lipid profile (cholesterol and triglycerides) and HbA1c.
Clinical records were also searched to see whether patients had been referred to and seen by an RD.

Results
25 patients (20%) went on to develop post-transplant diabetes or impaired glucose tolerance (IGT) within 2-3 years of transplantation. 9 of these (36%) were seen as an IP once immediately following transplant, and 6 (24%) were seen as an OP once, only after diagnosis of post-transplant diabetes or substantial weight gain. There was an average increase in HbA1c of 14.9mmol/mol (31% increase). Most common medications used to treat post-transplant diabetes were metformin, linagliptin, liraglutide, and Humalog 25.
Weight gain post-transplant was prevalent with 109 (87%) patients gaining weight (8.9kg average, range 0.5kg - 36.5kg). Furthermore, 27% of patients were obese pre-transplant compared to 43% post-transplant (see Figure 1).
Cholesterol increased post-transplant in 60% of patients (mean increase of ~1.2mmol/l. 61% of patients had high cholesterol (>4mmol/l) pre-transplant compared to 76% of patient post-transplant. Triglycerides increased post-transplant in 54% of patients (mean increase of ~0.94mmo/l). 16% of patients had high triglycerides (>2.3mmol/l) pre-transplant compared to 26% of patients post- transplant.

Discussion
20% of renal transplant patients developed post-transplant diabetes which is similar to previously reported figures1. Weight gain is associated with T2DM and it is likely that weight gain post-transplant increases risk of post-transplant diabetes5. Cholesterol and triglycerides also increased post-transplant posing a further increased risk of cardiovascular events. However, little dietary and lifestyle intervention was offered to these patients and when it was, it was often after large amounts of weight gain had already occurred. Furthermore, due to the high volume of outpatient appointments post-transplant patients attend, it is not feasible for these patients to be seen in a separate dietetic clinic. However, it may be a more-cost effective6 and useful strategy to employ a Renal Dietitian to run a group weight management session that facilitates education, rather than an individual program.

520

Genetic, Clinical, and Pathologic Backgrounds of Patients with Hereditary COL4A3/COL4A4/COL4A5 variants: Single Centre Experience

Dr Vishnu Jeyalan[1], Dr Michelle Chong[1], Dr Shaw Liew Kang[1], Dr Arvind Ponnusamy[1]
[1]*Renal Department, Royal Preston Hospital, Preston, United Kingdom*

Background
Alport syndrome is a nephropathy related to mutations in the COL4A3/COL4A4/COL4A5 genes and is inherited in a dominant, recessive and x-linked pattern. The clinical phenotype and histological finding varies between each mutation, timing, and renal risk factors which can mislead physicians. To confound matters further there can be further noncollagen/podocyte modifier genes that may have impact in altering the expected clinical course especially in those with TBM nephropathy.
Here we present a single centre experience of 5 cases with a varied presentation of a col4a disorders.

Methods:
We conducted a retrospective analysis of 5 patients with a genetically proven col4A disorder. Clinical, laboratory, genetic and pathologic data were collected from medical records. Genetic analysis was performed by next generation DNA sequencing of podocyte-related and Alport–related collagen genes, to make a diagnosis of COL4A disorder and identify possible modifier genes.

Results:
Amongst our series, we present a case that was initially diagnosed and treated as FSGS for several years in a different renal unit. On transfer of care to our centre due to relocation, a good clinical history revealed that his offspring had been having microscopic haematuria. This prompted the diagnosis to be reviewed and genetic testing performed revealed an X linked col4a5 mutation. Patient has recently been transplanted uneventfully last year at the age of 53.
We also present a case of a patient presenting with preserved renal function and haematoproteinuria. Renal biopsy at initial presentation revealed thin basement membrane only. However as renal function started to dwindle, genetic testing done revealed a COL4a3 recessive mutation. This prompted the expectation of an unfavourable renal trajectory and after almost 2 decades of follow-up, patient now has an eGFR of 17ml/min at the age of 56.
Lastly, we present 3 cases of a heterozygous COL4a3/COL4a4 disorder or TBM. However, on genetic panel testing each of these patients revealed a further non-pathogenic (modifier gene) NPHS2 variant. One patient was labelled as TBM based on family history alone at the age of 18 and was lost to follow-up. Patient represented now at age of 35 with hypertension and advanced CKD which prompted genetic testing
The 2 other patients had biopsies showing thin basement membrane nephropathy with an added element of foam cells and element of FSGS changes separately. Clinical course so far revealed preserved kidney function but with worsening proteinuria approaching nephrotic range despite RAAS inhibition.; see below table 1

Conclusion:
There is a varied presentation to COL4a disorders, therefore this diagnosis must not be overlooked. An extensive genetic panel screening will aid in giving clarity to the underlying mutation and associated modifier mutations which will have different projected clinical courses. The presence of these modifier gene is thought to impact functionality of already altered GBM and be a risk factor for CKD progression in patients with TBM.

Good clinical history corroborated with the biopsy and genetic testing is key in accurately diagnosing and managing these patients. It will aid in future planning with renal replacement therapy, transplantation and familial screening

521

Patency of tunnelled central venous catheters for haemodialysis access: a systematic review and meta-analysis

Dr Sarah Blakey[1], Dr Anamika Adwaney[1], Dr Damien Ashby[1]
[1]*Imperial College NHS Healthcare Trust, London, United Kingdom*

Introduction
Arteriovenous fistulae (AVF) are widely regarded as the optimum vascular access in haemodialysis patients; however, tunnelled dialysis catheters (TDC) are often advocated as an alternative for older more comorbid patients, and those in whom native vascular access creation is unfeasible, with clinicians increasingly recognising the importance of patient choice. Little is known about the expected patency of TDCs, yet this information may be valuable in informing shared decision making between physicians and haemodialysis patients.

Methods
We performed a literature search using Pubmed, EMBASE and Cochrane Library, through inception to January 2020. We identified studies featuring adult patients, in which TDC patency in conventional upper body sites was reported as a primary or secondary endpoint. Where individual studies compared two or more patient groups (for instance, different TDC designs or insertion techniques), the patency for each group was considered as a separate cohort. We assumed an exponential model to calculate an equivalent 12-month patency for each cohort regardless of the duration of observation.

Results
After quality assessment, 98 studies, comprising cohorts of 8 to 812 patients, were included in our analysis. Many of the studies identified were intended to review or compare TDC designs, insertion techniques or lock solutions, but some of the cohorts were taken from studies comparing outcomes of different modalities of vascular access within a population.
In total, 12,636 TDC insertions were performed in 139 patient cohorts between 1984 and 2019. TDC patency was reported at between one and 60 months (median 6 months), with outcomes beyond 12 months reported for only 26 (19%) cohorts. TDC patency varied considerably between studies, with the equivalent 12-month patency ranging between 0% and 99.3% (weighted mean 52.0%). Some of the variation was geographic, with studies from USA typically reporting shorter patencies, and twin catheters, such as Tesiocaths, appeared more durable than single catheter designs (equivalent 12-month patency 70.7 vs 47.6%), but most of the variation is unexplained, presumably representing clinical practice variation.

Using a weighted exponential model of TDC survival, estimated secondary patency proportion was 67.5% at 12 months, 45% at 24 months, 29.5% at 36 months and 19.5% at 48 months (Figure 1).

Discussion
Our systematic review demonstrates marked variation in TDC patency between study cohorts. There is no clear explanation for the variability in TDC outcomes; however, it may be that differences in clinical practice are implicated, given similarities in patient demographics and TDC-related factors between cohorts. Based on patencies commonly achieved with over half still patent at 1 year, TDC access may be optimal and appropriately favoured in a number of clinical settings.

522

Outcomes at 90 Days Following Acute Kidney Injury Requiring Haemodialysis (AKI-D)

Dr Javeria Peracha[1], Dr Dimitrios Chanouzas[1], Dr David Keane[2], Dr Manoj Wickramasinghe[2], Dr Richard James[2], Dr Andrew Lewington[2], Dr Mark Thomas[3]
[1]Queen Elizabeth Hospital - University Hospitals Birmingham NHS Trust, Birmingham, United Kingdom, [2]Leeds Teaching Hospital NHS Trust, Leeds, United Kingdom, [3]Heartlands Hospital - University Hospitals Birmingham NHS Trust, Birmingham, United Kingdom

Background/Aims:

Acute Kidney Injury requiring haemodialysis (AKI–D) is associated with high mortality and poor patient outcomes. At present limited data is available to compare AKI-D patient outcomes across UK renal units. Identifying variation in patient outcomes and the possible reasons behind these is an essential first step in driving quality improvement in this area.

Methods:

Data on all patients with AKI receiving at least one session of intermittent haemodialysis (AKI-D) was collected separately at 3 UK renal units and collated to allow comparison of 90 day outcomes.

Patients at Centre 1 were identified over a 24 month period between 1st January 2014 - 31st December 2016. Centre 2 collected patient data over a 24 month period between 1st June 2017 - 31st May 2019 and Centre 3 over a 12 month period 1st April 2018 - 31st March 2019.

Patients were excluded if they had a kidney transplant, if they received continuous renal replacement therapy (CRRT) in an intensive care setting prior to having intermittent HD or if they were identified as having progressive chronic kidney disease (CKD).

Data collection was performed through data extraction from local IT systems and patient case note reviews. Baseline demographic data including patient age and gender was available for all 3 units. Data was also available on patient outcomes 90 days after their first HD session. Patient outcomes were classified into three groups: patients who had regained independence from renal replacement therapy (off RRT), patients who remained on renal replacement therapy (on RRT) and patients who had died.

Further work is still ongoing to collate additional data on co-morbidities, cause of AKI and more detailed patient outcomes.

Results:

The collated 3 centre data is presented in Table 1 and Figure1. Mean age of patients was similar across all three centres (65-67 years) and all centres had a slight male predominance (55-64%)

Patient outcomes varied considerably across the three centres (p=0.002). Centre 1 had the largest proportion of patients ‘off RRT’ but Centre 3 had the lowest mortality rates.

Conclusions:

This collated analysis from 3 UK renal units has demonstrated that outcomes following AKI-D are poor. Additionally there is considerable inter-centre variation in patient rates of regaining independence from dialysis and mortality at 90 days. Further analysis is being performed to identify whether the variation can be explained by differences in patient co-morbidities and case-mix. This early work supports the need for the reliable collection of data on patients requiring HD for AKI across the UK.

524

Outcomes of angioplasties in arteriovenous fistulae/grafts – a single centre tertiary care renal unit experience in the UK.

Dr Subash SOMALANKA[1], Dr Mohammad Rabiul Islam RONY[1], Dr Omaisa MUSHTAQ[1], Dr Andrew KEANE[2], Dr Nalin KHOSLA[2], Dr Kashif BURNEY[2], Dr David MAKANJUOLA[1]
[1]Renal unit, St. Helier Hospital, Surrey, United Kingdom, [2]Department of Radiology, St. Helier Hospital, Surrey, United Kingdom

Introduction
The arteriovenous fistula (AVF) is the preferred choice of access for providing haemodialysis (HD). It offers better blood flow rates and has less risk of infections as compared to HD catheters. However, AVFs develop neo-intimal hyperplasia leading to stenosis that occurs from an inflammatory cytokine drive and oxidative stress of dialysis due to vessel wall shear/stress (Hammes, 2015). Early detection and intervention of stenotic lesions are essential to prevent HD access loss. Fistulogram +/- fistuloplasty remains a mainstay of intervention to rescue HD access (Schmidli et al., 2018).

Methods
Data were retrospectively collected from the electronic databases of the departments of radiology and nephrology on renal access angiogram studies performed between April 2016 to April 2017 [378 days]. Analyses were done by MS Excel 2003.

Results
148 fistulograms were performed in 125 patients; 72 were male (M:F=72:54). There were 120 AVFs and 28 arterio-venous grafts (AVGs). The average age was 68.25 yrs (range 26-89 yrs; median 70 yrs). 42% were performed in diabetic patients. Ultrasound Doppler was performed before intervention in all cases and identified 122 cases of stenosis alone, 7 cases of thrombosis alone and 13 cases of combined stenosis and thrombosis. In 33 cases, multiple stenoses were detected. The stenoses were predominantly in left-sided AVF/AVG[L:R = 100:48]. The anatomical sites of access were 42 radio-cephalic, 69 brachio-cephalic, 19 brachio-axillary, 13 brachio-basilic, 3 brachial vein transpositions and 2 axillo-axillary grafts. Seven cases were in pre-dialysis patients. 11 cases had central stenotic lesions that required stent insertion. Successful balloon angioplasty was performed in 141 cases.
The patency rates at various time points are shown in table 1. At 4 weeks, 131 cases had patent dialysis access. At 3 months, 107 cases had patent dialysis access, and at 12 months, 71 were patent.

Discussion
End-stage kidney disease [ESKD] is recognised to be an inflammatory state. Well functioning vascular access is vital for providing adequate HD and maintaining the patency of HD access remains a challenge. Fistuloplasty is an essential intervention for stenotic AVF/AVGs. In our study, at the end of one year, around 40% of the AVF/AVG are non-functional. More than a third of the cases needed repeat angioplasty of AVF to maintain patency and if we are going to be able to ensure that we deliver on what we believe is the right choice of access (AVF/AVG) for patients, investment in interventional radiology is key to a successful outcome.

525

Implementing a multi-centre quality improvement project to improve access to and experience of home dialysis

Ms Catherine Stannard[1], Dr Richard Fluck[2]
[1]The Renal Association, Bristol, United Kingdom, [2]The Royal Derby Hospital, Derby, United Kingdom

Introduction

Despite national professional guidance and patient groups stating more people wish to dialyse at home there has been little consistent progress in the last 10 years. Only a handful of renal centres have more than 30% of patients dialysing at home. The UK Renal Registry reported that at the end of 2017 in the UK, 4.6% of dialysis patients undertook home haemodialysis (HHD) and 12.2% peritoneal dialysis (PD). This varied between centres from 0 to 16.2% for HHD and 0 to 24.4% for PD. Launched in January 2019, the DAYLife project aims to increase the number of people dialysing at home and reduce variation between centres, leading to better experience of care for patients and families, and better value of care due to reduced transport costs, improved self-management and an increase in patient quality of life.

Method

The quality improvement (QI) methodology used is taken in three steps. Step one - research and discovery, step two - ideas, step three - testing. During step three, centres agree which ideas to try, plan the testing of these solutions and monitor success using agreed metrics. Using the Kidney Quality Improvement Partnership (KQuIP) framework, two multi-professional QI leads are recruited from each unit to lead the QI project locally. Units are encouraged to hold monthly local meetings to review data and QI leads are offered support from a KQuIP programme manager. Quarterly regional events are held to present and discuss outcomes and share successes and challenges.

Ten units across the East and West Midlands took part in the first phase of the project, supported by KQuIP. The project was delivered alongside practical training in leadership and QI techniques including process mapping, driver diagrams, PDSA cycles and measurement for improvement. A national project data-set was developed including monthly home dialysis population numbers and numbers starting or dropping off home dialysis. This was collected centrally from all participating centres. Centres utilised the online quality improvement platform Life QI to track their project, input measurement and log PDSA cycles and learning. Data was backdated to January 2018 to give an accurate centreline.

Results

From the data collected thus far, six out of ten centres have seen either a positive shift (run of six points above the centreline) or increasing trend (five consecutive points increasing) in numbers of patients on a home therapy, PD or HHD since the launch of the project. One unit has seen a negative shift due to falling PD numbers and two have not yet seen a shift or trend in their data. Successful change ideas implemented include an audit of peritonitis rates, staff and patient education, introduction of an unplanned starter - PD pathway, pathway redesign for advanced kidney care and peer assist from expert patients. Whilst a regional trend cannot yet be shown, emphasis on local successes and the narrative behind positive trends and shifts in data as well as better understanding of the root cause of negative trends will provide the basis for sustaining and growing this improvement project.

527

Comparison of Various Induction agents in Low risk kidney transplantation – A single centre experience

Dr Girish Namagondlu[1], Dr Deepak Chitralli[1], Ms Binita Chauhan[1], Dr Shyam Sundar[1], Dr Ravindran Thamarai Kannan[1], Dr Madhusudhan Raju[1], Dr Arun David[1], Dr Sudhakar Shanmugam[1], Dr Ajit Huilgol[1]
[1]*Columbiaasia Hospital, Bangalore, India*

Introduction
Ideal induction agent in low risk kidney transplant is a subject of debate. Recent evidence has shown that no induction is probably as good as any induction agent in low risk group. Cost and affordability of induction agents are a real challenge in developing countries like India. Judiciously using or avoiding induction agents safely where possible makes a significant impact in such scenarios.

Aim
A single centre retrospective study to compare complication rates, renal graft and patient survival at 6 months with no induction and different induction regimens in low risk kidney transplantation

Material and Methods
We performed a retrospective study patients who underwent live kidney transplant between 2015-2018. One group received no induction, another group received basiliximab (simulect) 20mg, Anti T-Lymphocyte Globulin (Grafalon, ATLG) 3-5mg/kgBW or ATG (Thymoglobulin) 1-3mg/kg as Induction agent. Maintenance regimen was standard dose tacrolimus, mycophenolate mofetil and prednisolone.

Results
15 received No induction, 23 Grafalon, 12 Simulect and 22 Thymoglobulin. In no Induction group mean age was 37.3yrs with mean 6m s.creat of 1.3 . Grafalon group Mean age 41.5yrs (range 19-64) with 17 males. Mean S.Creat at 6months was 1.37 (0.7-2.4), eGFR-72ml/min)
Basiliximab Group Mean age 48yrs (range27-70) with 11 males in this group. Mean S.Creat at 6 months of 1.3 (eGFR-66.2ml/min), ATG (Thymoglobulin group) Mean age was 43.8 (range 29-57) with 19 males in this group, and all were 1 st transplant. Mean s.creat at 6months of 1.3 (eGFR-66.2).

Discussion
There was no statistically significant difference in complication rates, renal graft outcomes or survival amongst the groups. Choice of induction agent may not significantly alter complication rates in the first 6 months post transplant in low immunological risk group. No induction group had similar results to induction group and might be a safe and cost effective strategy.

528

Assessment of the incidence and outcomes of lymphomas in a single centre post renal transplantation

Dr Emma Morganti[1], Dr Nishanthi Senthivel[2], Dr Ruth Pettengell[3,4], Dr Joyce Popoola[1,4]
[1]Department of Renal Medicine and Transplantation St George's University Hospitals NHS Foundation Trust, London, United Kingdom, [2]The Royal Marsden NHS Foundation Trust, London, United Kingdon , [3]Department of Haemato-Oncology St George's University Hospitals NHS Foundation Trust, London, United Kingdon, [4]St George's University of London , London, United Kingdon

Introduction:
Post-transplant lymphoproliferative disorder (PTLD) is the second most common malignancy in transplant recipients after skin cancers. They are described more frequently in solid organ transplantation than post-haematopoietic stem cell transplantation due to the need for lifelong immunosuppression. In order to reduce our patients' long term immunosuppressant burden, we withdraw steroids between one and twelve weeks post transplantation and avoid the use of more than two immunosuppressive agents where possible. We hope these strategies will reduce dysregulation of the immune system and/or activation of viruses such as Epstein-Barr (EBV) contributing to malignancies. Here we assess the current incidence and outcomes in our unit.
Methods:
Renal transplant recipients diagnosed with lymphoma following transplantation in a single centre between 2012 and 2019 were identified. This work was carried out as a retrospective review of effected patients' electronic and paper records as well as direct liaison with the haemato-oncology department. Notes were reviewed for histology, EBV status, staging, treatment plans, outcomes following treatment, and associated morbidity and mortality. Patients in the cohort who were exposed to additional immunosuppression beyond protocol transplant immunosuppression were identified.
Results:
Of 586 renal transplant recipients followed up between 2012 and 2019, twelve were diagnosed with lymphoma (2%). 58.3% of these were exposed to additional immunosuppression due to pre-existing disease, high immunological risk and/or rejection. At lymphoma diagnosis, recipients were 1.7 to 313.5 months post-transplantation (mean 128.1), and aged between 27 and 72 years (mean 56.3), with a male female ratio of 9:3. Eight recipients were diagnosed with high grade lymphoma, five of whom had associated histological EBER positivity or peripheral EBV viral load. One patient was diagnosed with very high grade lymphoma, two with low grade lymphoma and one with anaplastic T cell lymphoma. Six patients had their transplant immunosuppression changed at diagnosis and three had a reduction in immunosuppression dose. Therapies included EPOCH, R-EPOCH, CODOXM, Rituximab and Obintuzumab. Of the patients with high grade lymphoma, one died due to other medical co-morbidities prior to treatment and one progressed through first line treatment and died on second line therapy. All other patients achieved remission with one relapse at 4 years. At the time of analysis all living patients have remained dialysis independent.
Summary:
The incidence of PTLD appears to be similar in our cohort of patients to the incidence that is widely reported in the literature (1-4.5%). Patients with high grade lymphoma who are well enough to receive treatment have a good prognosis. In this cohort, all surviving patients have maintained functional grafts. Patients with a higher immunosuppressant burden, even if only temporarily, may be at increased risk of developing PTLD. This could indicate a need for increased vigilance in anticipating PTLD in those receiving immunosuppression increments, and targeted monitoring and surveillance of higher risk category patients may be warranted. We plan to extend this review across our network sharing the same immunosuppression protocol.

529

Efficacy of Tolvaptan in the treatment of Autosomal Dominant Polycystic Kidney disease in maintaining residual renal funtion– a single centre experience

Dr Simon Williams[1], Dr Elin Davies[1], Dr Shahed Ahmed[1]
[1]*Royal Liverpool University Hospital, Liverpool , United Kingdom*

Introduction
Tolvaptan is approved for treating Autosomal Dominant Polycystic Kidney Disease (ADPKD). The TEMPO trial showed slowing of kidney growth (Total kidney volume (TKV)), and reduced rate of kidney function decline in patients treated with tolvaptan.[1] NICE advises patients with stage 2/3 chronic kidney disease (CKD) with evidence of progressing disease were eligible for tolvaptan.[2]
This project aimed at evaluating the efficacy of tolvaptan in a single nephrology department to assess whether the benefits of tolvaptan are reproduced in our patient population.

Method
We identified all patients with ADPKD treated with tolvaptan in the ADPKD clinic. Baseline characteristics were identified to ensure tolvaptan was started according to NICE. 45 patients were started on Tolvaptan but among them, 14 discontinued. Currently 31 patients are on Tolvapan therapy. 30 patients had been on tolvaptan for over 6 months were included for efficacy analysis.
Data was collected from the clinic database, letters, and blood results. Data was collected at 3, 6, 9, 12, 18- and 24-month intervals.

Results
15 males and 15 females with mean age of 50 years were on tolvaptan for over 6 months.
Baseline eGFR prior to commencing tolvaptan ranged from 30-84ml/min/1.73m2 (mean 50).
eGFR at 1 year for the 21 patients that had been on tolvaptan for 1 year ranged from 26-88ml/min/1.73m2 with mean 46. eGFR at 2 years for the 6 patients who had been on tolvaptan for 2 years ranged from 34-55ml/min/1.73m2 with mean eGFR 42. The fewer number over time reflects tolvaptan being discontinued or being on tolvaptan for under the specified timeframe.
Of the 21 patients that had been on tolvaptan for 1 year, the change in eGFR at 1 year ranged from -7 to +17ml/min/1.73m2 with a median change of -3.
Of the 6 patients that had been on tolvaptan for 2 years, the change in eGFR at 2 years ranged from -7 to 0 with a median change of -5.
Of the 14 that discontinued tolvaptan, 2 discontinued due to worsening renal function.

Discussion
In this retrospective study, tolvaptan was tolerated well, with only 5 patients discontinuing due to side effects.
The study shows a slowing of decline in kidney function with a mean decline of eGFR of 2ml/min/1.73m2 after 1 year and 8 ml/min/1.73m2 after 2 years. This, however, includes fewer patients being analysed over time due to differences in the stage each patient was at the time of our analysis, due to patients being commenced on tolvaptan at different times. The slowing of kidney function decline reflects that of the TEMPO study.

This study, however, does not look at slowing of the increase in TKV, which may be associated with slowing of kidney function decline. Furthermore, given the small sample size and short follow-up period, ongoing data collection is required to make comparisons with previous studies.

Conclusion

Our study findings suggest that those who have tolerated Tolvaptan, there is evidence of benefit with stabilisation and slower rate of progression, but this require further evaluation with larger study group and longer follow-up.

531

Establishing a PD catheter insertion service by nephrologists – a single centre experience

Dr Ajay Dhaygude[1], Dr Arvind Ponnusamy[1], Dr Beng So[1], Charge Nurse Hector Maclaren[1], Dr Sharmila Bandyopadhyay[1]

[1]*Royal Preston Hospital, Preston, United Kingdom*

Introduction

There is a growing recognition that in many UK renal centres, the proportion of patients opting for peritoneal dialysis (PD) is suboptimal. According to 19TH Annual Report of UK Renal Registry Data ,in our centre only 16 % (Ref:1) opted for PD, the national average being 18%. This led to the creation of a nephrologist led PD catheter insertion service in 2016. Percutaneous Seldinger PD catheter insertion service in day case unit was provided on weekly basis. Outcome data for the years 2018 / 2019 presented .

Methods

Electronic patient records were used to identify all the patients and collate the data from 2018 - 2019. Results are presented in line with the Renal Association's Peritoneal Access (RA) audit criteria.

Results

Sixty-four patients underwent catheter insertion over 2 years. Four (6%) required manipulation within the first month for dysfunction. 39 catheters are still in use. Twelve received transplant, 5 died with a functioning catheter and 8 changed modality to in-centre haemodialysis (ICHD). Reasons for ICHD were: 1 pleuro-peritoneal leak, 1 early exit site infection with leak, 1 chronic exit site infection, 1 tunnel infection, 1 recurrent peritonitis, 1 persistent left hypochondriac pain after starting PD and 2 for technique failure. Our catheter patency rate exceeded the RA audit criteria at 83% (target >80%). One patient experienced bowel perforation (1.5%) target <1% . There were no significant haemorrhagic events (target < 1%) and only 1 (2%) exit site infection within 2 weeks of insertion (target <5%).

Table 1.

Discussion

Our previous PD access service was dependent on a small number of surgical colleagues and had limited scope for expansion. We demonstrate that a Nephrologist led service can be established within a short timeframe with limited resources, with outcomes that meet audit criteria set out by the RA and International Society for Peritoneal Dialysis. With timely insertion of PD catheters, our PD programme has expanded from 35 to 50 patients and are able to offer our patients genuine choice of RRT modality. In 2018/19, only 9 patients had surgical insertions. This was either due to patient choice wanting general anaesthetic , or multiple previous surgical interventions especially with midline scars . One patient needed hernia repair as well. Overall, the good outcomes of our service places us on solid foundations for expansion to include acute PD in the near future.

532

Estimated Glomerular Filtration Rate Equations: Do we need to use the ethnicity correction factor in the United Kingdom?

Miss Amanda Clery[1], Dr Rouvick Gama[2], Mr Neil Heraghty[2], Prof Adrien Peters[2], Dr Hugh Cairns[2], Prof Claire Sharpe[1], King's College London Kate Bramham[1]
[1]King's College London, London, United Kingdom, [2]King's College Hospital , London, United Kingdom

Background: Estimated glomerular filtration rate (eGFR) equations are recommended for management of chronic kidney disease (CKD) in national and international guidelines. The most commonly used equations, Modified Diet and Renal Disease (MDRD) and CKD-EPI, were derived from large population studies in the United States and include use of a correction factor for Black ethnicity. However, recent studies from different African countries suggest eGFR equations are more accurate without the use of an ethnicity correction factor. In the UK, the rate of CKD in people of Afro-Caribbean ancestry is up to 3-5 times higher than Caucasians. Accurate assessment of GFR is important for early diagnosis and appropriate management. This study aimed to assess the accuracy of eGFR equations, with and without ethnicity correction factors compared with gold standard ^{51}Cr-ethylenediaminetetraacetic acid (^{51}Cr-EDTA) clearance assays.
Methods: All ^{51}Cr-EDTA studies were extracted from hospital databases from 2009-2019 and corrected for body surface area. Demographics including self-reported ethnicity, sex, age and referral specialty were recorded. Creatinine (IDMS traceable assay) and albumin concentrations taken within one week of ^{51}Cr-EDTA study were recorded. Patients with albumin <30g/dl, referrals from hepatology (due to possible reduced muscle mass and interference with creatinine assays), <18 years old, non-white or non-black and mixed ethnicities and those with incomplete data were excluded. The accuracy of CKD-EPI and MDRD equations for calculating eGFR, with and without the ethnicity correction factor, compared to gold standard ^{51}Cr-EDTA GFR was assessed using bias, precision and 30% accuracy. These were calculated overall, and in subgroups by ethnicity and GFR categories.
Results: After exclusions, 2776 ^{51}Cr-EDTA studies were identified. Mean age was 54 years, 43% were female, and 12% of self-reported Black ethnicity. Compared to the gold standard GFR, White patients had a bias of 14.3 and 14.6ml/min/1.73m² using the CKD-EPI and MDRD equations, respectively. In Black patients, the eGFR equations significantly overestimated GFR compared to White (bias 20.3 and 19.4ml/min/1.73m² respectively, $p<0.001$). Disregarding the ethnicity correction factor significantly improved GFR estimates for Black patients (bias 6.7 and 2.2ml/min/1.73m² for CKD-EPI and MDRD respectively, $p<0.001$). Accuracy was superior for GFR≥60ml/min/1.73m² compared to <60ml/min/1.73m² using CKD-EPI equation for both White and Black patients ($p<0.001$) and for MDRD equation for White patients (Table 1).
Discussion: To our knowledge this is the largest study to explore the use of eGFR equations in people of Black ethnicity living outside the US and Africa. The important finding of overestimation of true GFR with eGFR equations using ethnicity correction factors suggest that current UK practice may lead to reduced rates of CKD diagnosis and under-recognition of CKD severity in people of Black ethnicity in the UK. Limitations of the study include retrospective design, lack of information about hydration and fasting status, use of Jaffe assay, potential inclusion of patients with medical conditions which may affect muscle mass and creatinine excretion and number of black patients with CKD. These findings require validation in other centres and in a prospective study.

533

The knowledge base deficiency of Acute Kidney Injury (AKI) management amongst healthcare professionals: Cause for concern.

Dr Chris Agbo[1], Mr Ken Spearpoint[1], Dr Sivakumar Sridharan[1], Dr Kunle Ashaye[1]
[1]*School of Life & Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom*

Introduction:
Acute Kidney Injury is one of the medical emergencies that have attracted a lot of attention over the last decades due to the associated mortality and morbidity. It has becomes a focus for patient safety both within the local Trust and nationwide. The impact of AKI is enormous both on the patient`s outcome – mortality, length of stay and also a huge cost to the National Health Service (NHS), (Chertow GM et al, 2005). There are about 100,000 deaths per year in hospital associated with acute kidney injury; about 30% of such cases could be prevented with the right care and treatment (Stewart J, 2009). However those at risk of developing AKI potentially are prevented simply by avoidance of nephrotoxic medications and adequate fluid management (Hussein HK et al, 2009)
The National Confidential Enquiry into Patients Outcome and Death (NCEPOD) 2009 in a national audit of the care provided to patient who died with a diagnosis of AKI in United Kingdom hospitals revealed several shortcomings. NCEPOD (2009) reports that the poor management of AKI is commonly related to poor clinical care and it is recommended that all medical staff receives regular teaching on AKI to improve their knowledge and skills. The purpose of this study was to establish the level of understanding of healthcare professional caring for patient with AKI and way to provide intervention if there are deficiencies.
Method:
This is a cross-sectional using an online questionnaire survey. The questionnaire was posted using the Survey monkey online tool via a link sent to individual emails that allows the respondent to answer the question and the anonymised response received through the survey monkey tools. The online survey link was sent out via mail to staff of three Trusts within Cambridgeshire and Hertfordshire regions between May and July 2019.
Results:
The total number of respondent was 135.The total number of the respondents that got the definition of AKI right was 46(34%), the staging of AKI slightly lower 42(31%). In all the groups there was a higher number of respondent that got the risk factors, assessment and observation correct with percentages as 85%(116), 68%(92) and 78%(105) respectively. There was no association or correlation between higher grade of the clinicians and the higher knowledge of AKI management. Only 37% of the respondents had a teaching on AKI prior to the survey.
The performance score of individuals' responses with a maximum score of 10, did not show any strong association with the grade of the healthcare professional and the knowledge of AKI management. It also did not show that there is any significant correlation between those that received any form of teaching on AKI and those who never received any teaching on AKI.
Conclusion:
Our survey identified specific gaps in knowledge of AKI management amongst healthcare professional. Educational intervention will be required to increase the awareness of AKI management will may improve the clinical outcome.

534

Bacteraemia in haemodialysis patients

Dr Ursula McGee[1], Dr Rhodri Pyart[1]
[1]*University Hospital Of Wales, Cardiff, Cardiff, United Kingdom*

Introduction
Infection remains one of the leading causes of death in patients receiving haemodialysis. An impaired immune system, comorbid disease and the need for regular vascular access all contribute to the increased risk of infection. Bacteraemia in haemodialysis patients are common but establishing the clinical significance, underlying cause and contributory role of dialysis access type from the wide range of implicated pathogens is uncertain. Here we describe the experience of a large tertiary renal centre.

Methods
Data was collected using a Crystal Reports system which links the local renal database to the laboratory clinical portal. Each episode of bacteraemia in an adult patient receiving either acute or chronic haemodialysis was counted during the three-year period from 01/01/2016 – 31/12/2018. Repeated growth of the same organism within 4 weeks was considered the same episode, while each different organism was considered a new episode. The dialysis access type (fistula, graft or line) was obtained from the renal database. Where available the cause of the bacteraemia was extracted from the discharge letter system, other microbiology results on the clinical portal and renal database clinical entries. Patient survival was censored at 31/12/2019.

Results
233 patients with median age 64 years (IQR 53-74) had 363 positive bacteraemia episodes during the 3 year period (347, 14 and 2 patient episodes cultured 1, 2 and 3 distinct bacteria species respectively). There were 24.3 bacteraemia cultures per 100 patient dialysis years. 84 patients had more than one episode of bacteraemia in the 3 year period; one patient had seven episodes.
Table 1. Class of bacteria, clinical source of bacteraemia and dialysis access type

MSSA – methicillin sensitive staphylococcus aureus, MRSA – methicillin resistant staphylococcus aureus, G +ive cocci - exclude Staphylococcus sp.
In the commonest pathogen groups, early mortality was high, irrespective of bacteria type (figure 1).

Figure 1. Survival from the time of first bacteraemia during this period (no adjustment for subsequent transplantation)
Discussion
A broad spectrum of organisms cause bacteraemia in dialysis patients and all groups of bacteria appear to be associated with morbidity and mortality. Dialysis lines continue to be a major source of bacteraemia and continued efforts are needed to prevent line related infection. Most episodes of bacteraemia however are not line related reflecting the comorbid nature of our dialysis patients who have many other risk factors for the development of infection. Adjustment is not made for such case-mix differences between centres in published mortality data and therefore caution is needed in their interpretation.
The IT linkage system used here allows real time reporting of bacteraemia rates as well as to monitor and compare other outcome measures in renal patients and contribute to improvements in patient care. The system contains data on confounding variables such as comorbidity and renal replacement therapy history and vintage which will allow a more robust survival analysis to be undertaken in the future.

535

Baclofen toxicity as a reversible cause of decreased consciousness in haemodialysis patients

Dr Charlotte Quick[1], Dr Adam Macdiarmaid-Gordon[1], Dr FARID GHALLI[1]
[1]*Brighton And Sussex University Hospitals, Brighton, United Kingdom*

Introduction
Baclofen is a γ– aminobutyric acid (GABA) agonist frequently used as a muscle relaxant in the management of spasticity. Renal excretion is the main route of elimination as 70-80% of the drug is excreted unchanged in the urine. In patients with CKD, Baclofen dose should be reduced even with mild CKD. Starting baclofen at a low dose and careful monitoring for toxicity are two crucial points if it is used in haemodialysis patients. In this case report, we describe a haemodialysis patient presented with altered consciousness due to baclofen toxicity.

Method
A 75-year-old lady was admitted from the haemodialysis unit with increased drowsiness and kinetic muscle twitches. She had no apparent motor deficit or focal neurological abnormality. She had had a cerebrovascular stroke a few years ago. CT showed only the old infarct and no acute abnormalities. She was treated with vancomycin and gentamicin for a suspected line infection. However, inflammatory markers were never raised and there was no significant growth from repeated cultures. Despite antibiotics, she continued to be drowsy and hypotensive with intermittent pyrexia.
On day three of her admission, it was noted that her Baclofen (Oral 10mg TDS) had not been ordered from pharmacy. She had become more responsive and even conversational. Once her Baclofen was restarted, her consciousness level deteriorated. The drug was stopped as the suspected cause of the impaired consciousness.
On day four, she was unable to tolerate haemodialysis due to ongoing hypotension. Withdrawal of dialysis and a focus on palliative care was considered. However, it was noted that there had not been an opportunity for the Baclofen to be cleared. After a 4 hours dialysis session, she became more alert. With further dialysis sessions, she continued to become more responsive and the twitching resolved. Once back to her cognitive baseline she was discharged.

Discussion
Altered consciousness in haemodialysis patients encompasses a vast list of differential diagnoses. A systematic approach and review of medications can provide important diagnostic pointers. In this case, Baclofen accumulation was the cause. Adverse reactions as a result of Baclofen include hypotension, CNS depression and less frequently hypertonia.
It is excreted mainly by the kidney. Four hours haemodialysis session removes 79% of the drug. However, patients on dialysis are liable to baclofen toxicity. If Baclofen is required it should be used with a dose reduction and increased time intervals between doses. Alternative drugs should be considered, increasingly Tizanidine and Dantrolene.
It is possible to measure Baclofen levels and there would be merit to checking levels in haemodialysis patients when there is diagnostic uncertainty surrounding altered consciousness.
In cases of toxicity, haemodialysis can be used to aid removal. Multiple sessions may be required to sustain the improvement in consciousness.

Conclusion

Although Baclofen is readily removed by dialysis, dose accumulations can occur. Therefore, dose adjustments should be considered in haemodialysis patients and CKD patients. If Baclofen toxicity is suspected, haemodialysis should be used to aid clearance.

536

Review of histological variants and outcomes in IgA Nephropathy

Dr Amy Hudson[1], Dr Aine De Bhailis[1], Prof Philip Kalra[1], Dr Smeeta Sinha[1]
[1]*Salford Royal Foundation Trust, Manchester, United Kingdom*

Introduction
IgA nephropathy (IgAN) is the most common cause of primary glomerular disease worldwide. It has a wide spectrum of clinical presentations, varying from isolated haematuria to anuric renal failure. The risk of progression is often evaluated in routine clinical practice by thorough evaluation of proteinuria, blood pressure and eGFR at the time of presentation. In addition, the OXFORD MEST score gives consensus criterion for the pathological classification of this common renal diagnosis. This enables accurate prediction of disease progression and individual prognostication. The aim of our study was to investigate the association of baseline clinical data and histological variants upon renal outcomes in our cohort of patients with IgA nephropathy. Since end of 2013, our renal centre cohorts patients with known glomerulonephritis diagnoses into a bespoke "Complex Glomerulonephritis" (CGN) clinic.

Methods
All available patients with biopsy-proven IgAN in our centre between January 2014 and January 2020 were included in this retrospective observational study. Baseline data at the time of biopsy included patient demographics and laboratory variants. Renal biopsies were reviewed and histopathological variants were collected according to their MEST scores. Follow up data on renal function and mortality data was collected, which included death, loss to follow up and ESKD.

Results
A total of 1165 renal biopsies were performed at our centre in this 6 year period; 182 of these biopsies revealed a diagnosis of IgAN. The median age of the cohort at diagnosis was 46 years, ranging from 17 to 86 years. Males accounted for 66% of the cohort. 91% of these biopsies were of native kidneys, with the remaining 9% being transplanted kidneys. 9% of the cohort died during the follow up. The main indications for biopsy were: renal impairment and haematoproteinuria (36%); known IgAN with progressive CKD and/or proteinuria (20%), nephrotic syndrome (12%) and HSP-type presentation (10%). Median creatinine at biopsy was 152umol (ranging from 46-2045). Median UPCR was 212 (ranging from 5-3083). 24% required some form of RRT. 46% were treated with RASi alone following the biopsy result; 28% received some form of immunosuppressive therapy (prednisolone monotherapy, MMF and prednisolone, IV cyclophosphamide and prednisolone). 18% had crescents on their biopsies (+C score). Those with crescents on their biopsies had an average 8% increase in their creatinine during follow-up, compared to a 10% decrease in creatinine for those with no crescents.

Conclusion
Ongoing evaluation of the predictive utility of these scoring systems is recommended for early effective treatment intervention. Despite considerable improvements in histological characterisation to predict progression in IgAN, the optimal therapeutic management remains debatable. RASi is essential in management of BP control and proteinuria reduction. Additional immunosuppression is of benefit in those at risk for a progressive disease course.
Mesangial hypercellularity (M-score) is considered a sensitive predictor of disease progression. 53% of our cohort had an M1" score. Our CGN clinic allows us to appropriately cater for these individuals with a more rapid annual decline in eGFR.

537

Kidney Function decline in patients with ADPKD: data from the UK ADPKD RaDaR Registry

Dr Ragada El-damanawi[1,2], Ms Tess Harris[3], Professor Fiona Karet Frankl[4], Dr Thomas F Hiesmtra[1,2], Dr Daniel Gale[5], Dr Richard Sandford[4]

[1]Cambridge Clinical Trials Unit, Cambridge, United Kingdom, [2]Division of Experimental Medicine and Immunotherapeutics, Cambridge, United Kingdom, [3]PKD Charity, London, United Kingdom, [4]Division of Renal Medicine and Departments of Medical Genetics, Cambridge, United Kingdom, [5]Royal Free Hospital, London, United Kingdom

Background and Aims:
The National Registry of Rare Kidney Diseases (RaDaR) was established in 2010 by the UK Renal Association with the primary objective of creating a comprehensive registry to facilitate characterisation of and research into rare kidney diseases. The initiative also aimed to provide greater patient support. To date, more than 6500 ADPKD patients have been recruited, combining a wealth of longitudinal clinical, laboratory, imaging and genetic data spanning decades. We evaluated patient characteristics and patterns of disease progression in a pre-end stage kidney disease (pre-ESKD) ADPKD cohort, recruited across 88 centers in the United Kingdom.

Method:
In this large, observational cohort study, we included ADPKD participants from the RaDaR registry that were over the age of 16 years, with a baseline eGFR ≥ 20mls/min/1.73m2 and not currently taking tolvaptan. Patients with less than 1 year of kidney function follow-up data were excluded from the analysis. We examined the demographic and clinical characteristics and the development of kidney failure (defined as eGFR <15mls/min/1.73m2) or requirement for renal replacement therapy.

Results:
Of 6420 ADPKD patient records in RaDaR, 21.8% (n=1805) had no eGFR data, 24.1% (n=1545) had a kidney transplant, 0.9% (haemodialysis n=50, peritoneal dialysis n=8) were on dialysis and 8.4% (n=540) were on tolvaptan. 47 patients had died after RaDaR enrolment.

We included 1922 patients with a median of 16 (IQR 7-35) eGFR values observed over 3 decades (1991-2019) in the analysis. Median age was 43 years (IQR 32-53) with 56.0% (n=1076) older than 40 years and 55.5% (n=1062) female. The majority (67.8%, n=1303) were White British, 9.9% (n=190) were Black, Asian and minority ethnic (BAME), and for the remainder ethnicities were recorded as unknown. Baseline median eGFR was 73.8 mls/min/1.73m2 (IQR 48.5-99.1), and 35.3% (n=679) had an eGFR <60mls/min/1.73m2. Males had a lower baseline median eGFR compared to females (69.3; IQR 44.8-95.8 versus 78.3; IQR 52.8-102.7 mls/min/1.73m2, p<0.001), and those >40 years old also had worse baseline kidney function compared to younger patients (56.0 IQR 37.5-74.0 versus 98.3 IQR 81.2-118.2 mls/min/1.73m2, p<0.001).

During follow up, the proportion reaching ESKD increased with advancing age group from 1% (2/195) in 16-30 year old patients, to 2.7% (10/374) in those between 31-40 years, 10.8% (46/427) in those 41-50 years, 13.7% (65/474) in 51-60 year old's, 19.9% (55/277) in the 61-70 age category and finally 29.7% (52/175) in those aged ≥ 71 years old (figure).

Conclusion:

We report the proportion of patients reaching kidney failure across age categories in a large cohort of ADPKD patients. These data underestimate the true incidence of kidney failure in ADPKD as our analysis excluded patients with kidney failure at the point of RaDaR enrolment. Although limited by missing data for some participants, RaDaR provides a rapidly expanding and unprecedented resource for studying the natural history and treatment of ADPKD.

538

Impact of Vitamin D Supplementation on Vascular Function, Vascular Structure and Immune Regulation in Patients with Chronic Kidney Disease and Low Vitamin D Levels – A Pilot Randomised Trial

Dr Rebeka Jenkins[1,2], Dr Debasish Banerjee[1,2], Dr Ingrid Dumitriu[2], Dr Irina Chis Ster[2], Dr Emily Heavey[3], Professor Juan Carlos Kaski[2]

[1]St George's University Hospitals NHS Foundation Trust, London, United Kingdom, [2]St George's University, London, London, UK, [3]University of Huddersfield, Huddersfield, UK

BACKGROUND

Vitamin D deficiency contributes to the excess cardiovascular morbidity and mortality in patients with chronic kidney disease (CKD), yet there is limited evidence from randomised controlled trials (RCT) for a beneficial effect of vitamin D supplementation. Creative study methodology can avoid prohibitively large and lengthy trials of and contribute to understanding of mechanistic pathways.

METHODS

A pilot study was performed to assess the feasibility of a single-blinded RCT of cholecalciferol supplementation (5x 20,000 IU over 20 weeks) versus no supplementation in patients with CKD Stage 3-4 and serum total 25-hydroxyvitamin D <75 nmol/l on vascular function (assessed by flow mediated dilatation of the brachial artery), vascular structure (assessed by carotid intima media thickness), and absolute frequency and percentage of CD4+CD28null T lymphocytes and regulatory T cells (implicated in the immuneregulation of atherogenesis). The study tested methods of participant recruitment, participant retention, randomisation, acceptability and adherence to group-specific cholecalciferol supplementation instructions. Preliminary statistical analyses were performed to derive the necessary input for larger settings.

RESULTS

40.9% of eligible patients were recruited reaching 72% of target over 12 weeks. The retention rate was 91.6%. Cholecalciferol treatment and control groups were well-matched at baseline (see table). Quantitative and qualitative analysis of participant feedback demonstrated a largely positive attitude to participation with thematic analysis identifying a high prevalence of the theme of positivity of experience with subthemes of a beneficial feeling, confidence and altruism. The data showed string evidence for a significant difference in the serum 25-hydroxyvitamin D levels at study completion between the cholecalciferol treatment and control groups, the higher levels in the cholecalciferol treatment group remaining significant after adjusting for the baseline 25-hydroxyvitamin D level with analysis of covariance (51.32 mmol/l difference between groups, 95% CI [36.28, 66.37], p<0.001. This indicates adherence to the group-specific cholecalciferol supplementation instructions. At follow up there was no significant difference between the cholecalciferol treatment and control groups in flow mediated dilatation (p=0.49), carotid intima media thickness (p=0.95), percentage of CD4+CD28null T lymphocytes (p=0.43), absolute frequency of CD4+CD28null T lymphocytes (p=0.21), percentage of regulatory T cells (p=0.25) or absolute frequency of regulatory T cells (p=0.45).

CONCLUSION

A pilot trial performed using the methodology of this single-blinded pilot study of cholecalciferol supplementation generated results which can inform the planning of future a priori statistically powered similar experiments.

540

Fluoroscopic-guided tunnelled haemodialysis catheters are associated with a low delivered dose of radiation

Dr Elizaveta Sokol[1], Dr Richard Corbett, Dr Damien Ashby, Mr Paul Herbert, Dr Peter Hill, Dr James Tomlinson
[1]*Hammersmith Hospital, London, United Kingdom*

Introduction: Fluoroscopy-guided insertion of tunnelled haemodialysis catheters is considered routine practice in cases where timely native dialysis access cannot be achieved. However there is no current guidance available to define an acceptable and safe radiation exposure specific to this procedure aside from the requirement to keep doses as low as reasonably practicable for the intended clinical purpose of each examination.

The closest procedure for which a National Reference Dose for fluoroscopic procedures is available are Hickman lines where the mean screening times is 61s and a dose-area product (DAP, a measure of the absorbed dose multiplied by the area irradiated) of 2Gy.cm2. We set out to establish our practice to support local guidance.

Methods: We conducted a single-centre retrospective study of all tunnelled haemodialysis catheters inserted by either a nephrologist or transplant surgeon, outside a formal radiology department. All lines were placed in a dedicated procedures room adjacent to a ward using fluoroscopic screening by experienced operators who had undergone training in relation to Ionising Radiation (Medical Exposure) Regulations 2000. We collected information on all catheters inserted from March 2019 (right internal jugular catheters) and November 2018 (left internal jugular catheters) through to October 2019. Removal and reinsertion procedures were excluded due to the limited number.

Results: During the time period covered by this study 80 tunnelled-haemodialysis catheter were inserted using a right internal jugular (RIJ) vein approach, and 44 were sited via the left internal jugular (LIJ) vein. All catheters were Tesio long-term haemodialysis catheters comprising two separate lumens.

The mean DAP for RIJ tunnelled catheters was 0.35 Gy.cm2 (Median 0.24; 10th centile 0.08; 90th percentile 0.76). Mean DAP for LIJ tunnelled catheter was 0.56 Gy.cm2 (Median 0.39; 10th centile 0.03; 90th centile 1.27).

Mean RIJ screening time was 7.3s (Median 5.1; 10th centile 2.7; 90th centile 14.0). For LIJ, as might be expected given the greater complexity, screening time was longer at 16.1s (Median 9.42; 10th centile 5.6; 90th centile 29.8).

There was limited variability in both DAP and screening time between operators.

Conclusion: Our results show that in our centre, radiation exposure for tunnelled haemodialysis catheters is well below the diagnostic reference level for Hickmann line insertion. Our data should inform a diagnostic reference level specific to tunnelled haemodialysis catheters and help to ensure radiation exposure is kept as low as reasonably practicable for the procedure.

541

Case report - Persistent pyrexia and acute kidney injury related to severe drug-related granulomatous tubule-interstitial nephritis secondary to ciprofloxacin.

Dr Katrina Sodzi[1], Dr Emma Montgomery[1]
[1]*Newcastle Upon Tyne Hospitals, Newcastle Upon Tyne, United Kingdom*

Background
Acute interstitial nephritis (AIN) is estimated to be the cause for acute kidney injury (AKI) in 15-20% cases [1] and drugs are thought to account for 70% of those. The presence of granulomatous tubulo-interstitial nephritis however is rare occurring in approximately 0.5-0.9% of kidney biopsies [2]. The findings of granulomas have been linked with infections or antibiotics such as vancomycin, ciprofloxacin, nitrofurantoin, penicillin and cephalosporins[2].
Case report
A 50 year old Caucasian female with a past medical history of polymyalgia rheumatica, hypothyroidism and anxiety presented to the emergency department following a recent diarrhoeal illness. She was confused, hypotensive and found to have an acute kidney injury (AKI stage 3, creatinine 326 mmol/l from a baseline creatinine of 54mmol/l). She required a HDU admission for inotropic support and was subsequently transferred to the renal unit. Blood and urine cultures were positive for E. coli. Despite treatment with IV Tazocin (piperacillin with tazobactam) for 10 days and then oral ciprofloxacin she continued to have intermittent episodes of pyrexia (39 degrees Celsius) with raised inflammatory markers (c-reactive protein (CRP) >200) and an AKI (creatinine 140mmol/l). There was no significant eosinophil levels detected at any point during her admission.
Over the next 3 weeks she remained pyrexial with no significant improvement in her blood results but remained clinically well apart from her high temperatures. Her CT imaging was reported to show “severe inflammation of both kidneys with small (non-drainable) focal collections bilaterally” and the ultrasound showed bulky enlarged kidneys measuring 13cm each.
A Positron Emission Tomography with CT (PET- CT) was requested to look for other sources of infection which might explain her persistent pyrexia and CRP. It revealed striking, bilateral increased renal cortical activity but no evidence of an alternative source of infection/inflammation.
Her renal biopsy had appearances of severe granulomatous tubulo-interstitial inflammation with white cell casts. The differential diagnosis of these appearances lies between infection (although no microorganisms are demonstrated on special stains) and a severe drug-related tubulo-interstitial nephritis. The degree of chronic damage was difficult to assess in the context of such severe acute changes but there was felt to be at least mild chronic tubulo-interstitial damage.
Microbiology testing of the biopsy sample did not reveal any organisms and 16S rDNA PCR testing was negative suggesting no active bacterial infection despite repeated temperatures above 38 degrees Celsius and CRP above 100. The decision was therefore taken to stop antibiotic treatment and start treatment with corticosteroids.
Outcome
Following the initiation of steroid therapy, her inflammatory markers and renal function started to improve and her pyrexia resolved within 72 hours.
Conclusion
Renal biopsy was critical in establishing the diagnosis and adjusting management. However it is often difficult to distinguish if the appearances are related to the underlying infection itself or the antibiotics used to treat the infection. Previous case reports and clinical experience suggest that in drug related

granulomatous interstitial nephritis the removal of the offending agent and initiation of corticosteroid therapy usually results in improvement in renal function.

542

Influenza and pneumococcal vaccination promotion and uptake amongst patients with ANCA associated vasculitis: a Quality Improvement Project

Dr Zhia Ning Lim[1], Sarah Logan[1], Dr Ellen Kay[1], Dr Joshua Caplan[1], Dr Raheej Khan[1], Dr Matthew Morgan[1,2], Professor Lorraine Harper[1,2], Dr Dimitrios Chanouzas[1,2]

[1]University Hospitals Birmingham NHS Trust, Birmingham, United Kingdom, [2]University of Birmingham, Birmingham, United Kingdom

Introduction

Infection is the leading cause of death amongst patients with ANCA-associated vasculitis (AAV). Immunisation against influenza and pneumococcus is strongly recommended for patients with AAV. The national target for influenza immunisation uptake set by the World Health Organisation is to achieve at least 55% coverage for those who are aged under 65 and 'at risk', and 75% for those aged over 65. We aimed to evaluate the uptake of influenza and pneumococcus vaccination amongst patients with AAV over a period of 3 years in a large tertiary referral vasculitis centre.

Methods

Data on influenza and pneumococcus vaccination uptake were collected by sending letters to GP practices at the end of two influenza seasons. The first round of data collection evaluated influenza and pneumococcal vaccination uptake over the 2015 influenza season. A questionnaire was then distributed to 80 patients with AAV to understand patient views on vaccination uptake. Patient education days were organised to promote vaccination uptake. The second round of data collection measured influenza and pneumococcal vaccination uptake over the 2018 influenza season.

Results

Data were collected from 93 patients for the 2015 influenza season. Influenza vaccination uptake was 62% (58/93). 58% of AAV patients under the age of 65 (25/43) and 66% of patients over 65 (33/50) received the influenza vaccine. 40% of patients (37/93) had received the pneumococcal vaccine at some point in the past, whilst 39% (36/93) had received it within the last 5 years.

80 AAV patients were invited to complete a questionnaire aiming to elucidate reasons for uptake or refusal of vaccination. Influenza vaccination uptake amongst the questionnaire respondents was a little higher compared to the 2015 season respondents (71% versus 62%). We found that patients who refused to have vaccinations had misconceptions regarding vaccination or felt it was unnecessary for them to have the vaccine. 58% of respondents wished to have more information. 20% of patients that wished to have more information had never received the influenza vaccination. Out of the 17 patients that had never received the influenza vaccination, 53% (9/17) wished to have further information. Patient education days were organised and delivered with an emphasis on promoting vaccine awareness.

Data were subsequently collected from 237 patients for the 2018 influenza season. Influenza vaccination uptake was 60% (143/237). 57% of under 65s and 62% of over 65s had received the influenza vaccine during the 2018 season. 41% of patients had received the pneumococcal vaccination within the last 5 years, however the proportion of patients that had received the pneumococcal vaccination at some point in the past increased to 78% compared to 40% during the 2015 data collection.

Conclusion

Despite the high mortality risk associated with infection amongst AAV patients, vaccination uptake rates remain suboptimal. Provision of information in the form of education days may have been associated with an increase in pneumococcal vaccination uptake, however the rate of influenza vaccination uptake remained unchanged. Our findings suggest that a broader approach is needed to encourage uptake of vaccination in this vulnerable population.

543

Case series of Stenotrophomonas Maltophilia as a rare cause of PD Peritonitis

Dr Lauren Floyd[1], Dr Arvind Ponnusamy[1]
[1]*Royal Preston Hospital, Preston, United Kingdom*

Introduction

Peritoneal Dialysis (PD) peritonitis is a common and serious cause of PD related complications. Common organisms include Staphylococcus aureus, Enterococci and Coagulase Negative Staphylococci, however Stenotrophomonas maltophilia (S. maltophilia) is a very rare cause. It is a nosocomial gram negative bacillus that often occurs in immunosuppressed patients (1). The organism is considered opportunistic and is resistant to many antibiotics classes including beta-lactams and aminoglycosides, making it difficult to treat (2). The duration of treatment is usually over 6 weeks and complications can include concurrent fungal infections, PD catheter removal, conversion to haemodialysis and mortality.

Case Studies

We identified 3 cases of S. maltophilia over a 7 week period. The patients had a median age of 49 years. The patients presented with similar features of abdominal pain, cloudy PD fluid and pyrexia.
1 of the cases grew S. maltophilia from an exit site swab and the other 2 patients had positive PD fluid cultures, with WCC values of between 99 x 106/L to 4000 x 106/L. The organisms grown were all identified as Stenotrophomonas maltophilia.
All patients were on Continuous ambulatory peritoneal dialysis (CAPD) and had been for several years prior to this presentation. They shared common co-morbidities including diabetes mellitus and hypertension. One patient had an autoimmune condition and was on immunosuppression with Rituximab and prednisolone but the other 2 patients were not on any immunosuppressive medications.
The outcome of these infections were severe in all 3 cases. All patients required their infected Tenckhoff catheters to be removed. One patient had a tube reinserted 10 days later but went on to deteriorate and eventually pass away from underlying intraabdominal sepsis. The other two patients had the tubes removed and switched modalities to haemodialysis.
The organisms were fully sensitive to trimethoprim/ sulfamethoxazole and the average treatment course was 30.3 days. Two patients required additional antibiotic therapy including teicoplanin and gentamicin.
Two out of three patients required hospital admission and the average hospital stay was 24 days.
A root cause analysis was held as to why these patients presented with such a rare organism in a short space of time. Multidisciplinary meetings were held with microbiologists, PD home therapies teams, nurses and doctors.

Conclusion

In conclusion S. maltophilia is a severe infection that, whilst rare, has catastrophic consequences including a high burden of morbidity, morality, hospitalisation as well as loss of the PD catheters (1). Risk factors from our cohort and other case reports include immunosuppression, diabetes mellitus and exposure to broad spectrum antibiotics.
Treatment is often challenging and requires expert microbiology input. Extended courses of antibiotics (typically Co-trimoxazole) are required due to recurrence of the organisms and often the Tenckhoff catheters require removal and or replacement, as was the case in our 3 patients (2).
When rare cases occur in short succession it is often more than coincidence and root cause analysis and investigations into the potential links are paramount to prevent further cases.

544

Peripheral T helper cells may play a significant role in the pathogenesis of ANCA associated vasculitis

Dr Seerapani Gopaluni[1], Prof David Jayne[1]
[1]*University Of Cambridge, Cambridge, United Kingdom*

Introduction: Autoreactive T and B cells play a key role in ANCA associated vasculitis. Rituximab, an anti-B cell therapy induces remission in 90% of patients, however relapses are common. Return of B cells and rise in ANCA levels may predict relapse, however not all patients relapse with the return of B cells, implying a role of immune cells other than B cells. Recently described (1,2,3) peripheral T helper cells (CD4+PD1+CXCR5-)-PTH cells that aid B cells at the sites of inflammation may be relevant in explaining relapse risk.
Methods: Urinary lymphocytes (UL) and peripheral blood lymphocytes (PBMC) were studied in patients with active disease (n=22) and in remission (n=50), and compared with healthy volunteers (n=37) and disease controls- Giant cell arteritis, Behçet's disease (n=20), by flow cytometry and transcriptomic techniques.
Results: UL from patients with nephritis have a higher proportion of PTH (25% cf 0% in remission patients, p=0.001) and the majority (60%) are of activated phenotype expressing HLA-DR+. PTH cells are expanded in PBMC flowcytometric analysis (compared to healthy volunteers and disease controls) and typically display an activated phenotype. For patients (n=15) in whom a remission sample was available at 3 months, there was a reduction in the proportion of PTH cells (1.8% vs 0.45%, p=0.04). Further the ratio of PTH to circulating T follicular helper cells (cTFH) is higher in patients compared to controls. In vitro stimulation assays with anti-CD3/CD28 confirmed their non-exhaustive state by producing IL-21, IL17 and interferon gamma and in T-B co-cultures they help to differentiate memory B cells to plasmablasts and production of IgG on a par with cTFH cells. Transcriptomic analysis of sorted PBMC PTH cells confirmed a highly activated proliferating state. They express chemokine receptors such as CCR2, CCR5, CX3CR1 which may help trafficking of these cells to sites of inflammation. They also are enriched for cytotoxic enzymes such as Granzyme B, perforin, RANTES and NKG7. Immunohistochemistry and immoflourescent staining of kidney tissue confirm the presence of these cells, at times seen infiltrating the tubules. mRNA of urinary pellets from patients with active nephritis confirmed the presence of these cytotoxic enzymes suggesting the pathogenic potential of these cells. Single cell transcriptomics of PTH cells confirmed the presence of 5 different clusters-Th1, Th17, cytotoxic, TFH-like and regulatory.
Conclusion: In the investigation of immune dysregulation in ANCA vasculitis using flow cytometry, bulk and single cell transcriptomics, in-vitro assays and immunofluorescent techniques we identified a novel T cell subset of pathogenic potential.

546

Pembrolizumab-Induced Vasculitis and its Implications for Treatment

Dr Christina Tran[1], Dr Arvind Singh
[1]*University Hospitals Plymouth NHS Trust, Plymouth, United Kingdom*

Introduction:

Immune checkpoints are inhibitory receptors expressed on T-cells that control activation and dampen inflammatory responses to prevent tissue injury. Cytotoxic T-lymphocyte–associated antigen 4 (CTLA-4) and Programmed Cell Death 1 Receptor (PD-1) are two such immune checkpoints with key roles in regulating immune responses. Over-activity of PD-1 and CTLA-4 signalling can be induced by cancer cells to avoid immunosurveillance. Targeting these receptors with monoclonal antibodies that block their interaction with their natural ligands takes the brake off anti-tumour immunity, allowing T cells to identify and destroy malignant cells. This approach has demonstrated striking therapeutic potential across a range of cancer types. However, it has also led to a new class of drug side effect referred to as Immune Related Adverse Events (IRAEs), as blockade of these natural checkpoints can also unleash the immune system to attack healthy tissues.

Pembrolizumab is a therapeutic antibody that blocks the receptor PD-1 and is licenced for the management of non-small cell lung cancer and melanoma.

Case Study:

A 68-year-old female with a diagnosis of metastatic lung cancer was managed with Pembrolizumab immunotherapy. Her GP noted a gradual decline in her renal function since starting Pembrolizumab, and referred her for a renal ultrasound scan. Her urine dip was positive for blood only. She denied any urinary symptoms. A glomerulonephritis screen was sent and renal biopsy arranged.

Results:

Her renal USS showed complex cystic lesions. Blood tests indicated high titres of myeloperoxidase (MPO). Since stopping Pembrolizumab, her renal function improved in a week, from an eGFR of 23 ml/min to 32 ml/min, and a creatinine from 185 µmol/L to 144 µmol/L.

Discussion:

Previous case reports have highlighted the implication of immunotherapy in the development of autoimmune disease. Our case demonstrates a relationship between treatment with Pembrolizumab and the onset of MPO positive vasculitis, whereby the cessation of treatment led to an improvement in renal function. A similar case study proposed that Pembrolizumab had contributed to the development of antineutrophilic cytoplasmic antibody (ANCA) positive vasculitis. Indeed, aberrant expression of PD-1 has been referenced in the literature in the pathogenesis of Granulomatosis with Polyangiitis.

Conclusion:

Over-stimulation of T-cells can lead to a predisposition to autoimmune disease. In this case report, we have seen a temporal relationship between the start of treatment with Pembrolizumab and renal decline

associated with high MPO titres. MPO positivity is commonly seen with a number of malignancies. In our patient, a decline in function and high MPO titres were seen after initiation of treatment, with a resolution in renal function when immunotherapy was discontinued.

This case has identified a possible correlation between treatment with Pembrolizumab and a decline in renal function associated with high MPO titres. This may suggest a link between immune checkpoint inhibitors and the development of drug-induced vasculitis.

547

Cardiovascular outcome trials (CVOT) using newer anti-diabetic agents in chronic kidney disease: A systematic review and meta-analysis

Dr Nadia Sarween[1], Miss Nuvreen Phagura[2], Dr Adnan Sharif[1]
[1]University Hospitals Birmingham, Birmingham, United Kingdom, [2]University of Birmingham , Birmingham, United Kingdom

Background and Aims:
The latest consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) recommends metformin and lifestyle intervention as first-line therapy for type 2 diabetes. Second-line therapy recommendation is the use sodium-glucose cotransporter 2 (SGLT 2) inhibitors (if estimated glomerular filtration rate [eGFR] is adequate) or GLP-1 receptor agonists if eGFR is inadequate (or SGLT-2 inhibitors not tolerated). No recommendation is made for dipeptidyl peptidase-4 (DPP-4) inhibitors. Therapy choices are limited for patients with both type 2 diabetes and moderate-to-severe chronic kidney disease (CKD) and it is unclear from published data if observed cardiovascular benefits of newer anti-diabetic agents extend to the CKD cohort. The aim of this study was to undertake a systematic review of all published CVOT trials using newer anti-diabetic agents (GLP-1 receptor agonists, DPP-4 inhibitors and SGLT 2 inhibitors).

Method:
We searched MEDLINE (via PubMed and the Cochrane Central Register of Controlled Trials) up to 1st December 2019. Data was stratified by trial entry eGFR into normal (eGFR ≥60 ml/min) and CKD (eGFR <60 ml/min), with data extracted for primary major cardiovascular event (MACE) rates such as cardiovascular death, stroke and/or myocardial infarct. A meta-analysis with random effects model was performed to estimate overall hazard ratios (HRs) for MACE with newer anti-diabetic agents stratified by eGFR. Inter-study heterogeneity was assessed with the I2 index and Cochran's Q test.

Results:
We analysed 13 studies from 16 that were eligible after our search strategy, with 2 excluded due lack of data stratified by eGFR and 1 excluded due to combined MACE/renal outcomes. The studies (GLP-1 agonists; n=6, DPP-4 inhibitors; n=4, SGLT 2 inhibitors; n=3) had a combined total of 128,266 participants (22.1% with eGFR <60 ml/min). HR for MACE with GLP-1 agonists for participants with eGFR ≥60 ml/min was 0.87 (95% CI 0.77-0.98; p=0.02) and for participants with eGFR <60 ml/min was 0.90 (95% CI 0.78-1.04; p=0.14). HR for MACE with DPP-4 inhibitors for participants with eGFR ≥60 ml/min was 0.99 (95% CI 0.92-1.07; p=0.86) and for participants with eGFR <60 ml/min was 0.99 (95% CI 0.91-1.08; p=0.86). HR for MACE with SGLT 2 inhibitors for participants with eGFR ≥60 ml/min was 0.98 (95% CI 0.88-1.10; p=0.78) and for participants with eGFR <60 ml/min was 0.82 (95% CI 0.70-0.96; p=0.01). Significant heterogeneity was observed in the meta-analyses for each newer anti-diabetic therapy drug class stratified by eGFR.

Conclusion:
Among the newer anti-diabetic agents, our study suggests efficacy for prevention of MACE in the setting of CKD exists only for SGLT 2 inhibitors and not with GLP-1 receptor agonists or DPP-4 inhibitors. Targeted CVOT studies incorporating participants with diabetes and CKD are critical to guide glycaemic management in these high-risk patients. Until then, we suggest recommendations for second-line therapy in patients with

type 2 diabetes and renal impairment should be amended to reflect the current evidence base supporting prevention of MACE with SGLT 2 inhibitors versus other anti-diabetic agents.

548

Electronic alerts for acute kidney injury: Evaluation of early response by a clinical nurse specialist

Ms Sarah Mackie[1], Ms Rosiane Djotsa[1], Ms Amelia Holloway[1], Mr Hossameldin Hashem[1], Mr Kate Bramham[3], Ms George McMahon[2], Ms Kelly Wright[1], Ms Rebecca Freeman[1], Ms Geraldine Lee[4], Mr Satish Jayawardene[1]
[1]Kings College Hospital NHS Foundation Trust, London, United Kingdom, [2]School of Medicine, Monash University, Melbourne, Australia, [3]Kings College Hospital NHS Foundation Trust & King's College London, , United Kingdom , [4]Florence Nightingale Faculty of Nursing, Midwifery and Palliative care, King's College London, London, United Kingdom

Background
Acute kidney injury (AKI) is a common complex condition associated with substantial morbidity, mortality and cost (NHS £1.02 billion per year for AKI related inpatient care).
In 2013 NHS England in partnership with the UK Renal Registry, launched a National AKI Prevention Programme with the aim of improving the care of patients with AKI and recommended implementing patient safety alerts. AKI Clinical Nurse Specialists (AKI CNS) may provide a novel opportunity to improve outcomes for patients with AKI but there is limited understanding of the impact of their role.

Aims
To compare the use of AKI electronic-alerts (e-alerts) combined with early response from a AKI CNS with usual care for patients with AKI Stage 2 or 3 short-term outcomes

Methods
Data were prospectively collected between 6th February 2017 to 7th March 2019 for all patients who had triggered a stage 2 or 3 AKI e-alert in a tertiary centre. Demographics, management details and laboratory data were extracted from hospital databases. Patients selected for AKI CNS review was based on clinical judgement. Outcomes for patients who received intervention from the AKI CNS were compared with those receiving usual care (clinical team received AKI e-alert prompt to complete the AKI care bundle).

Results
417 patients were studied including 208 in the AKI CNS inpatient review group (AKI-CNS) and 209 in the usual care group (UCG). There were no demographics differences between groups. Significantly more patients in the AKI-CNS had AKI Stage 3 than the UCG (40% v 28%; P=0.01) and were more likely to have pre-existing chronic kidney disease (43 v 24%; P<0.0001).
A comparable proportion of patients progressed from stage 2 to stage 3 AKI (20% vs 23%) when reviewed by an AKI CNS but those admitted to ICU had a significant shorter stay in ICU (mean: 3.5 vs 13.0 days; P=0.042) compared with UCG. Overall mortality, recovery from AKI, time to recovery and length of stay were comparable in both groups despite those being reviewed by the AKI-CNS having more severe AKI and pre-existing CKD.

Conclusion
AKI CNS care for patients who have more severe AKI and with underlying CKD appears to lead to comparable outcomes as patients with less severe AKI and comorbidities receiving usual care. In addition, those that received AKI CNS care had a significantly shorter length of stay in ICU.
This study is likely to be underpowered to show significant differences between groups and without randomisation it is not possible to directly assess the impact of the AKI CNS role. However, these data are encouraging and suggest the AKI CNS role may improve patient outcomes and have substantial health

economic benefit. A randomised controlled trial is needed to formally evaluate the benefits of an AKI CNS combined with AKI e-alerts and AKI care bundle.

549

Bariatric surgery as a precursor to kidney transplantation in patients with chronic kidney disease

Miss Rochelle Blacklock[1], Miss Alice Spurr[2], Professor Iain Macdougall[1], Professor Ameet Patel[1], Dr Helen MacLaughlin[1]
[1]King's College Hospital, London, United Kingdom, [2]King's College London, London, United Kingdom

Introduction
Kidney transplantation is associated with a survival benefit and improvement in quality of life compared to those patients treated on dialysis. Access to kidney transplantation can be reduced for patients with higher degrees of obesity for a variety of reasons; however, contemporary outcomes are not different for obese and non-obese transplant recipients. Bariatric surgery has been used as a means to overcome size based barriers to kidney transplantation for those with chronic kidney disease (CKD). This exploratory analysis aimed to describe the impact of bariatric surgery on time to, and kidney transplant status of, a cohort of patients with CKD pursuing bariatric surgery as a precursor to kidney transplantation.

Methods
Retrospective review of clinical records of 81 consecutive patients with CKD who underwent bariatric surgery at our institution between March 2007 and October 2018. Data collected included: reason for surgery, anthropometric changes, kidney transplant status, and waiting times.

Results
36 (44%) patients were identified who underwent bariatric surgery with the intention to improve eligibility for kidney transplant waitlisting. 56% (n=20) were female and the mean (SD) age was 50.2 (6.6) years; mean (SD) pre-operative body mass index (BMI) 42.7 (5.2) kg/m². 97% of patients (n=35) underwent laparoscopic sleeve gastrectomy (LSG); 1 (3%) had a laparoscopic adjustable gastric band inserted. Mean (SD) time from referral to bariatric surgery was 15.9 (8.3) months. Follow-up time post bariatric surgery ranged from 3 months to 11.3 years (mean (SD) 3.9 (3.3) years). 16 patients (44%) proceeded to kidney transplantation. Of the remaining 20 patients: 4 (11%) are waitlisted for transplantation, 4 (11%) died (including 1 post-operative death following LSG) and 12 patients remain unlisted (3 (8%) due to comorbidities and 9 (25%) secondary to weight - 7 of these 9 have undergone surgery within the preceding year and are not yet at maximal weight loss). Of those transplanted, mean (SD) BMI at the time of transplantation was 32.2 (4.1) kg/m² representing a mean (SD) decrease in BMI of 8.6 (4.2) kg/m² and mean (SD) total weight loss of 22.3 (9.1) %. The mean (SD) time from bariatric surgery to kidney transplantation was 2.5 (1.4) years.

Conclusions
Our findings demonstrate that access to kidney transplantation is a common motivation for patients with CKD to pursue bariatric surgery. Whilst bariatric surgery can facilitate significant weight loss, our data show that access to kidney transplantation is not guaranteed with 44% of patients remaining unlisted at the time of review. Further, pursuing weight loss through bariatric surgery prior to transplantation is associated with wait times, which may increase the time spent on dialysis for some, and is not without risk.

550

Cardiac Magnetic Resonance Imaging for the Assessment of Intra-dialytic Diastolic Function

Dr Huda Mahmoud[1], Dr Charlotte Buchanan[2], Dr Azharuddin Mohammed[3], Dr Eleanor Cox[2], Katrin Köhler[4], Dr Bernard Canaud[4], Prof Susan Francis[2], Prof Chris McIntyre[5], Prof Maarten Taal[3], Dr Nick Selby[3]
[1]University of Nottingham, , United Kingdom, [2]University of Nottingham, Sir Peter Mansfield Imaging Centre , Nottingham , United Kingdom, [3]University of Nottingham, Centre for Kidney Research and Innovation, Derby, United Kingdom, [4]Center of Excellence Medical Europe, Middle East and Africa, Fresenius Medical Care, Bad Homburg, Germany, [5]Medicine and Biophysics, Schulich School of Medicine and Dentistry, Western University, , Canada

Myocardial diastolic dysfunction (DD) is an independent risk factor for morbidity and mortality in haemodialysis (HD) patients. DD often precedes systolic dysfunction and is evident in up to 50% of patients with ESKD and preserved systolic function.
Cardiac Magnetic Resonance Imaging (CMRI) is the gold standard for assessing diastolic dysfunction through assessment of left ventricular (LV) deformation and left atrium (LA) size. In this study, CMRI was used to assess changes in diastolic function during a HD treatment.
Methods: Participants underwent serial CMRI (Phillips 3T Achieva) including short-axis cine, 2 and 4 chamber views and cardiac tagging during a single HD treatment; the scans were performed pre-dialysis, during dialysis at 30, 120, 180 mins and 30 mins post-dialysis.
LV longitudinal diastolic deformation parameters of early diastolic strain rate (eDSR) and peak diastolic strain rate (pDSR) expressed as percentage per second (%.s-1) were assessed. Lower values indicate a decline in the rate of LV relaxation and therefore ventricular filling. Left-atrial volume index ml/m2 (LAVI) was assessed as a chronic marker of DD with LA enlargement being an independent cardiovascular risk factor.
Results: 10 participants were studied: median age 47yrs (IQR 41 to 62), two female, three with pre-existing LVH. Median dialysis vintage was 14.5 months (4.4 to 73.5), median pre-dialysis systolic blood pressure 134 (116 to 155) mmHg and diastolic blood pressure 78 (71 to 84) mmHg.
Prior to the commencement of dialysis, all participants had lower eDSR and pDSR values than normal adult reference ranges. Median pre-dialysis values for eDSR and pDSR were 32.1 (25.5 to 38.0)%.s-1 and 53.7 (40.6 to 63.6) %.s-1 respectively. Median eDSR and pDSR did not change significantly across the different HD time-points, but nadir eDSR (22.4, IQR 15.9 to 31.5%.s-1, p=0.05) and nadir pDSR (40.7, IQR 27.0 to 52.9%.s-1, p=0.04) were significantly lower than pre-dialysis values. Lower eDSR values were associated with higher total ultrafiltration volume and ultrafiltration rate, at 30 minutes (r=-0.85, p=0.01 and r=-0.9, p=0.007, respectively) and nadir (r=-0.64, p=0.05 and r=-0.74, p=0.02, respectively). Neither eDSR or pDSR were affected by changes in systolic/diastolic BP.
Prior to commencement of dialysis, participants had higher LAVI values than normal adult reference ranges. Pre-dialysis median LAVI was 41.1 (35.1 to 44.2) ml/m2 and declined at 120 mins to 24.5 (18.3 to 35.5) ml/m2 (p=0.01) and at 180 mins to 31.7 (30.1 to 44.7) ml/m2 (p=0.05) but returned to baseline values post-dialysis (31.7 (IQR 30.1 to 44.7) ml/m2 (p=0.4). At 180 mins higher UF volumes were associated with lower LAVI (r=-0.67, p=0.05). LAVI was not affected by changes in systolic/diastolic BP.
Conclusion
This is the first study to utilize CMRI to assess intra-dialytic myocardial diastolic function. Prior to dialysis all participants evidenced DD, even those with no history of cardiac dysfunction. During dialysis, diastolic dysfunction deteriorated, which was associated with ultrafiltration volume and rate. Our data add to previous studies showing that diastolic function, in addition to systolic function, is adversely affected by haemodialysis.

551

Talk Transplant at 20 or Run the Risk?

Dr Sherry Masoud[1], Dr Elvin Subramanian[1], Dr Qiaoling Zhou[1], Dr Jim Moriarty[1]
[1]*Gloucestershire Royal Hospital, Gloucester, United Kingdom*

Talk Transplant at 20 or Run the Risk?

Introduction

Renal transplantation represents the best treatment for end-stage renal disease (ESRD) for those patients suitable. There remains variance in access to transplantation, and this is not entirely explained by patient characteristics. Several regions, including ours, have adopted improving access to transplantation as a regional Kidney Quality Improvement Partnership (KQuIP) priority[1].

With an overall aim of "More transplants, faster, with better experience" we have adopted a change idea of a documented transplant decision for patients with eGFR≤20ml/min. Here, we measure our local baseline state of transplant decision making in a single unit, and consider whether tools other than eGFR such as a 4 variable kidney failure risk equation (KFRE) can help stratify risk of needing renal transplantation and be used to prioritise pre-transplant workup.

Methods 1

Data on patients ≤80 years old, receiving nephrology care in a Low Clearance clinic, with eGFR≤20ml/min measured in the last 180 days, was extracted from the renal medical record. Patients with acute kidney injury were excluded, as were patients who had not completed initial clinic workup. Fields for transplant status, clinical problem list and the last five clinic letters were examined for evidence of a decision regarding transplantation.

Methods 2

A KFRE was applied to the patients identified above with eGFR 16-20ml/min. A threshold of ≥40% risk of needing dialysis or transplant over the next 2 years was used to identify the highest risk patients[2].

Results 1

For patients with eGFR≤15ml/min, 36/39 had a clear transplant decision documented in the electronic medical record. Of those with a clear decision, 30/36 had this recorded in the "Transplant Status" screen, the others elsewhere in the record.

Decision making was less clearly documented in the eGFR16-20ml/min group, where only 32/72 patients had a clear transplant decision noted.

Results 2

In patients we identified with eGFR 16-20ml/min, there is variability in the predicted two-year risk of progression to end stage renal disease. 10/72 patients had a <10% 2-year risk of progression to ESRD, and only 13/72 had a >40% 2-year risk of progression to ESRD.

Conclusion

Local recording of transplant decisions is robust for patients with CKD5 but less so for patients with only marginally better renal function, eGFR 16-20ml/min.

An eGFR trigger of 20ml/min to prompt discussion of transplant options and commence transplant workup will capture many high-risk patients, but also a substantial number at lower risk of progressing to ESRD.

A risk-based approach may be a more selective than an eGFR-based trigger in identifying and prioritising patients with renal disease who might benefit from renal transplantation.

552

Streamlining and Monitoring of Live Kidney Donor and Kidney Transplant Recipient workup Pathways

Mr Samuel Turner[1], Dr Dominic Taylor, Ms Diane Evans[1], Ms Beena Jose[1], Ms Lesley Read[1], Ms Lins Varughese[1], Ms Deborah Munro[1], Miss Anusha Edwards[1]
[1]North Bristol NHS Trust, Bristol, United Kingdom

Introduction

The South West Kidney Quality Improvement Partnership (KQuIP) is a multidisciplinary, regional quality improvement project and part of the 'Think Kidneys' Initiative led by NHS England with the UK Renal Registry. Based upon patient and staff feedback about prolonged waiting times and unnecessary delays, the regional KQuIP team agreed to focus its work on improving access to transplantation, under the tagline 'More Transplants, faster, with the best experience'.

With this aim, our service planned to streamline workup pathways for both Living Kidney Donors (LKDs) and Kidney Transplant Recipients (KTRs). The target pathway length for both was 18 weeks. For LKDs this was taken from initial contact to final signoff and for KTRs from referral for transplant assessment to activation on the national deceased donor kidney waiting list.

Methods

A 3 visit LKD pathway was created: initial nurse-led triage; 'medical day' - one-visit measured GFR and CTRA and 'Surgical day' - independent assessment and pre-operative assessment. For the KTR pathway, an e-referral form was created and implemented at the transplanting centre. In order to monitor both pathways, existing local databases were modified to include dates of all referrals, visits and investigations. Analyses of LKD and KTR workup time were performed before and after the implementation of these changes.

Results

Before implementation of the new pathway, LKDs made a median of 9 visits over 300 days from initial contact to final signoff. Following the changes this reduced to a median of 8 visits over 184 days.

Before implementation of the above changes, KTRs waited median 119 days from referral to activation, reducing to 58 days after pathway changes were made. Introduction of the e-referral for KTRs reduced median time from referral to receipt in the office from 17 days to 0 days.

Discussion

The main outcome of this work has been the implementation of prospective, robust monitoring of LKD and KTR workup pathways by simply recording on a spreadsheet the dates of all visits and investigations. For LKDs, streamlining the pathway has led to a modest reduction in overall pathway length but the number of visits has remained unchanged; reasons for this include the requirement for additional assessments outside the standard pathway and regional referral centres not being able to follow the new pathway for logistical reasons. For KTRs, the introduction of an e-referral and monitoring of individual patients on the pathway appears to have halved workup time. Streamlining of workup pathways is challenging and requires buy-in from the whole multi-disciplinary team, as well as ongoing reinforcement of the importance of the changes for quality improvement. We would like to thank the KQUiP initiative for providing initiation, guidance, training and structure for our projects, and the whole transplantation team for contributing to this important work.

553

Decimation of PD exit site infections means routine surveillance is unnecessary

Katie Naylor[1], Melissa Brassington[1], Hannah Gosling[1], Dr Shazia Adalat[1]
[1]*Evelina London Children's Hospital, London, United Kingdom*

Introduction
We present a review of peritoneal dialysis (PD) catheter exit site infections in patients receiving PD and looked after by a tertiary paediatric nephrology unit. We investigated the contributing factors related to these infections. The 2017 Clinical Practice Guideline for Peritoneal Dialysis in Adults and Children provide guidance on investigation, monitoring and treatment of exit site infections but it was unclear how frequent exit site infections were following newer interventions to reduce infection rates in our unit.
Methods
31 children were reviewed over a four year period (511 patient months) in a tertiary paediatric dialysis unit. All patients were receiving chronic peritoneal dialysis at home.
All parents/carers were deemed competent to maintain exit site sterility having completed a minimum of three dressing changes on initiation of dialysis, under supervision from a member of the home therapies team, consisting of dedicated PD clinical nurse specialists. Carers were then instructed to change exit site dressings twice per week and as required when the dressing was not intact. Assisted PD was available to patients unable to perform cares of PD.
Routine exit site swabs were obtained three monthly along with MRSA and nasal swabs. Exit site swabs were also obtained if there were any concerns about exit site integrity e.g. redness, discharge, granuloma etc. Topical antibiotic administration was used to reduce the frequency of exit-site infection and peritonitis. Patients (and/or carers or parents) underwent regular revision of their technique (at least annually or more frequently if indicated, such as after an episode of PD-related infection).
Results
Between 14-18 prevalent patients per year received chronic PD therapy between 2015-2019 (98-151 PD months/yr). Only 2-3 patients were affected by exit site infections per year. Organisms isolated were Staphylococcus aureus, Klebsiella oxytola, Pseudomonas aeruginosa, Serratia Marcescens and Enterococcus Casseliflavus. All patients had clinical symptoms or signs (erythema, discharge, granuloma). Factors that predisposed to exit site infection included younger age and presence of other –ostomies. Only one patient had to change modality due to inability to eradicate Pseudomonas exit site infection. Routine exit site swabs in the absence of clinical symptoms or signs were consistently culture negative.
Conclusion
Very low rates of exit site infections were identified in our tertiary paediatric unit. Contributory factors to aid this may have included a proactive approach including twice weekly dressing changes, the use of a PD belt and an occlusive semi-transparent, flexible film dressing (parafilm) for the end of the covered PD catheter and extension set junction. Factors that could not be controlled as easily such as presence of -ostomy site in close proximity to the PD exit site accounted for a significant proportion of the observed exit site infections.
Based on this retrospective data we plan to discontinue routine exit site swabs in the absence of clinical symptoms. Exit site swabs will be performed only if there is a clinical indication to do so. We will continue to monitor using digital photographs of exit sites taken by carers on a three monthly basis.

554

How to routinely collect electronic patient-reported outcomes in renal units in the UK?

Dr Sabine N Van der Veer[1], Dr Angelo Ercia[1], Dr Sarah Knowles[2], Professor Ken Farrington[3], Ms Francine Jury[1], Dr Michael Rees[4], Mr Tim Whitlock[5], Dr Fergus Caskey[6]

[1]Centre for Health Informatics, University Of Manchester, Manchester, United Kingdom, [2]Health Sciences, University of York, York, United Kingdom, [3]Renal Unit, East & North Hertfordshire NHS Trust , Stevenage, United Kingdom, [4]School of social, historical and political sciences, University of Wolverhampton, Wolverhampton, United Kingdom, [5]UK Renal Registry, Bristol, United Kingdom, [6]Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, United Kingdom

BACKGROUND

The Transforming Participation in CKD (TP-CKD) initiative showed there was an appetite to collect patient-reported outcome (PRO) data as part of renal services; studies in other disease areas suggested that this may improve patients' experiences and outcomes [1]. However, how best to embed collection and use of PROs into usual care pathways is still largely unknown [2]. The Optimising routine collection of electronic patient-reported outcomes (OPT-ePRO) study therefore aimed to develop a strategy for implementing electronic PROs (ePROs) in UK renal units.

METHODS

Normalisation Process Theory (NPT) guided the development of the OPT-ePRO strategy [3]. We had three dialysis units and three outpatient clinics (transplantation, low clearance and peritoneal dialysis) across three trusts.

We reviewed the literature and conducted: non-participant workflow observations (39 hours); audio-recordings of clinic consultations (177 minutes); and three participatory co-design workshops with patients (total n=25) and two with staff (n=13). We thematically analysed all data using the constant comparative method [4]. For the IT elements of the strategy, we worked with the UK Renal Data Collaboration (UKRDC), trusts' IT departments and the PatientView supplier. We described all intervention elements in line with relevant reporting guidance [5], while mapping them to NPT constructs.

The study was approved by the North West - Greater Manchester West REC (ID 245870).

RESULTS

As part of the OPT-ePRO implementation strategy, we extended the UKRDC IT infrastructure to facilitate collection, transfer and feedback of ePRO data (see Figure). It enabled patients to enter ePRO data via PatientView, which they could access on any PC or mobile device. Before each clinic consultation, staff would invite a patient to enter their ePRO data. Results were sent to the UKRDC, and pushed into the renal unit's EPR system for the renal team to review and discuss with the patient. An overview screen in the EPR displayed current and previous ePRO results in tabular format, with colour-coding linked to severity. Clinicians could generate pop-up screens to graphically display scores for individual ePRO items. Patients could access their own ePRO results in PatientView.

The table presents all strategy elements. Materials and procedures left room to organise ePRO implementation in a way that fitted units' local context. All staff materials were combined into a handbook that contained information on how different aspects of the ePRO implementation would work. Patient materials were mostly delivered as flyers with concise messages, handed out in clinic, or included in patient

letters. Local champions were involved in delivering several parts of the strategy, and were usually a nurse manager and consultant nephrologist.

DISCUSSION

Study sites have started using the strategy in practice. We are currently monitoring ePRO response rates and conducting qualitative research to identify implementation barriers and explore ways to address them in order to iteratively refine the strategy. Once all major barriers have been addressed, we expect the strategy to be suitable for deployment by other renal units, thereby enabling national implementation of ePROs in UK renal services and contributing to harnessing their potential benefits for patients and healthcare services.

555

A qualitative analysis of the experiences of established in-centre haemodialysis patients aged 80 years and over

Ms Harprielle HUNJAN[2], Dr Dominic DE TAKATS[1,2]
[1]University Hospitals of North Midlands, Stoke-on-Trent, United Kingdom, [2]Keele University School of Medicine, Stoke-on-Trent, United Kingdom

Introduction
Little has been published on the lived experience of being an in-centre haemodialysis patient. First impressions can be that patients are being maintained alive in their advanced years whilst not necessarily deriving a good quality of life (QoL). Attempts to quantify QoL involve questionnaire surveys with pre-specified domains, but such primarily quantitative analysis can miss the richness inherent in oral testimony. In this qualitative research the themes emerged from the interviews with the patients rather than being pre-specified.

Aim
To collect and analyse aspects of the lived experience related to their treatment for older patients undergoing in-centre haemodialysis.

Method
An in-depth semi-structured interview was conducted with established haemodialysis patients aged >=80 years. These were digitally recorded, transcribed and the collected transcriptions were subjected to interpretative phenomenological analysis.

Results
Eight female and 12 male patients aged between 82 and 90 years old with an average dialysis vintage of 5.9 years took part. Three had previously done peritoneal dialysis, 95% were white British, all were retired, 11 were married. 85% did not understand why their kidneys had failed.
The following eight themes emerged as those which were important to this patient group: Time taken up with the treatment, particularly when transport is also taken into account; Relationships with the dialysis team (sources of support, confidence, friendship and help); Patient education (wanting to better understand what was going on); Autonomy (finding as much room for self expression, hobbies, family life as possible within the constraints of the dialysis schedule and restrictions); Quality of life (with most accepting that there would be no life without dialysis); The difficult balance of post-dialysis fatigue with the good days and the overall benefit; The difficult emotional balance between dependency, tendency to low mood and a duty of gratitude for life-sustaining treatment and everyone's hard work; Recognition of the fact that attending in-centre haemodialysis thrice weekly, meeting with the same group of peers and sharing experiences is a sociable activity.

Discussion
The patients interviewed were not a random selection of those aged >=80 years with end-stage kidney disease but represented a both a self- and physician-selected group to start on dialysis, and a survivor cohort on dialysis, with no supportive care comparator group. That means that these experiences can only be evaluated on their own terms and not in contradistinction to any alternative care pathway.

Conclusions

This cohort of older dialysis patients were happy to discuss their experiences as dialysis patients. They felt able to be critical as well as grateful; mainly they were realistic. Though reported as a cohort, it was very clear that they remain individuals, each with a unique take on their experience. It is not possible to know a patient's experience by observation; if you want to know what they think and feel about their treatment, ask them.

556

Case study demonstrating a successful individualised weight loss program for a haemodialysis patient to enable transplant listing.

Dr Emma Montgomery[1], Mrs Amita Godse[1]
[1]*Newcastle Upon Tyne Hospitals, Newcastle Upon Tyne, United Kingdom*

Background
For haemodialysis patients the age adjusted mortality is high and remains comparable to malignancy. Dialysis patients report lower physical activity levels, poorer quality of life, and consequently higher rates of depression. In the UK diabetes remains the most common cause of ESRD which is strongly linked with obesity. Therefore many patients on dialysis are overweight or obese. In our haemodialysis unit 61% of patients had a BMI >25 and 31.6% a BMI >30.
Previous literature has reported the 'obesity paradox' were obese patients on haemodialysis demonstrated a survival advantage compared to their malnourished counterparts. However dialysis patients then often face a barrier when obesity prevents access to kidney transplantation.
To date there is very little published information or literature regarding 'dieting' or non-surgical weight loss studies in haemodialysis patients.
Method
We identified a 57 year old lady on haemodialysis who was struggling to lose weight to be eligible for transplant listing. She had been trying lose weight for 3 years and had been on haemodialysis since February 2017. She had tried a variety of diets without success. She was keen to look for non-surgical options for weight loss. Our renal dieticians organised food diaries and calculated that she would need to lose 10.5kg to enable listing for transplant. Our current local guidelines require a BMI <35 for patients to be activated for deceased donor listing.
We discussed her lifestyle and eating habits and devised a meal replacement program individualised for her. She replaced her 3 usual meals with fortisip compact protein drinks. With her calculated daily nutritional intake information below, our estimated weight loss was approx. 1 kg per week.
Daily intake:

- Calories 900
- Protein 54g
- Carbohydrate 91.5g
- Potassium 10.2mmol

Results
She made progressive weight loss over the following 3 months, losing over 10kg and reaching her target BMI of 35 by 11 weeks.
She completed her transplant workup and was listed on the deceased donor list 4 weeks later and was called for kidney transplant 5 weeks following that. To date her weight remains stable with no significant weight gain.
As fortisip is not a complete nutritional supplement she was also offered 'pregnacare' vitamins (the only on the market multivitamin that doesn't contain vitamin A). At baseline, 8 weeks and 12 weeks we measured her micronutrients and vitamins to ensure there were no deficiencies. She required no additional replacement.
The most difficult element was the frequent need for adjustment of target weight in line with her rapid weight loss and on one occasion this was set too low which resulted in a hypotensive episode.
Discussion
Supporting haemodialysis patients with weight loss though individualised meal replacement programs can be both safe and successful. Close monitoring however must be paid to their target weight, blood pressure

along with micronutrients and vitamins. This does require more frequent reviews and more resources over a short period of time however the patient benefits and long term cost savings to the NHS is significant.

557

Understanding the holistic experiences of living with a kidney transplant: initial findings from a qualitative study

Dr Clare Mckeaveney[1], Dr Aisling Courtney[2], Dr Paul Gill[3], Dr Sian Griffin[4], Professor Peter Maxwell[2], Dr Helen Noble[1], Professor Joanne Reid[1]

[1]Queens University Belfast, Belfast, United Kingdom, [2]Belfast Health and Social Care Trust, Belfast, Northern Ireland, [3]Cardiff University , Cardiff, Wales, [4]Cardiff & Vale University Health Board, Cardiff, Wales

The aim of this project will be to investigate the holistic experiences when living with a kidney transplant in the United Kingdom (UK). This project will provide essential insights into living with a kidney transplant using an interpretative phenomenological approach. The study will be conducted at two Regional UK Regional Nephrology Units which facilitate all kidney transplant procedures. While quantitative research reinforces a patient population, experiencing significantly reduced quality of life and mental well-being compared to the general population, currently very little is known about the perceptions and experiences of kidney transplant recipients from a qualitative perspective. As highlighted by the European Kidney Health Alliance recommendations, providing holistic care to kidney patients is important however this is currently an unmet care need in renal disease. There is a pressing need to understand patient experiences to ensure that they are included in key strategies and future renal service planning. Ignoring these important patient views means that there is a significant risk of inappropriate renal service provision and lack of adequate support impacting on overall health. A purposive sampling strategy will recruit post-kidney transplant adult recipients, 6 months – 5 years post-transplant. A maximum of 30 patients will be recruited across the units via clinical gatekeepers. Interviews will be audio-recorded, transcribed verbatim and subjected to interpretative phenomenological analysis. It is important that health care professionals (HCPs) understand more than the biological impact of receiving a transplant. Understanding the holistic and multi-domain experiences that these patients experience will help HCPs to recognize the needs of this group and ensure more responsive care. Initial findings to be reported.

558

Relationships of middle molecules and Protein-bound solutes to Residual Kidney Function in patients receiving HD

Dr Raja Mohammed Kaja Kamal[1,2], Professor Ken Farrington[1,2], Dr Jessal Patel[2], Professor Griet Glorieux[3], Professor Sunny Eloot[3], Professor Wim Van Beisen[3], Dr Sivakumar Sridharan[1,2], Dr Enric Vilar[1,2]
[1]Lister Hospital, Stevenage, UK, Stevenage, United Kingdom, [2]School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom, [3]Nephrology Division, Ghent University Hospital, Ghent, Belgium

BACKGROUND:
Residual kidney function (RKF) can contribute significantly to overall solute clearance in patients receiving haemodialysis (HD) and provides numerous clinical benefits. KDOQI guidelines suggest that Kt/V targets may be reduced in those with urea clearance (KRU)>2ml/min/1.73m2. Measurement of RKF requires cumbersome inter-dialytic urine collections. Use of serum biomarkers to estimate RKF could eliminate the need for these collections. We have previously reported an estimate of RKF based on Beta-2-microglobulin (B2M) and Beta-Trace Protein (BTP). We wished to determine whether inclusion of other biomarkers could improve this estimate. As part of this we investigated a series of candidate middle molecules and protein-bound solutes (PBS) to determine their relationship to RKF.

METHODS:
We measured glomerular filtration rate GFR (mean of urea and creatinine clearance) from inter-dialytic urine collection. Pre-dialysis blood samples were collected to measure serum BTP, B2M, Tumour Associated Trypsin Inhibitor (TATI) and plasma PBS molecules in 100 patients receiving HD. The relationship of these serum biomarkers to GFR was determined using correlation analysis (Spearman's correlation coefficient).

RESULTS:
Mean age of participants was 67.3 ±15.6 years. Sixty-one were male and 74 white. Median GFR was 3.0 (IQR 4.1) ml/min. Eleven were anuric. Median serum levels of the biomarkers and results of the correlation analyses with GFR are shown in the table. Levels of BTP, B2M, TATI and most PBS were negatively correlated with GFR. The strongest relationships were with BTP, B2M, TATI and Indole acetic acid.

CONCLUSION:
There were strong negative correlations between measured GFR and BTP, B2M, TATI and Indole acetic acid. These markers may have a role as predictors of RKF in patients receiving HD.

559

Biopsy proven Membranous Nephropathy: Patient characteristics and outcomes from 2005 to 2017. A single center experience.

Dr Bamidele Ajayi[1], Dr Raja Rashid[1], Dr Rafeea Shah[1], Dr Azmul Hussain[1]
[1]*Birmingham Heartlands Hospital, UHB NHS trust, Birmingham, United Kingdom*

Introduction:
Membranous nephropathy (MN) is the commonest form of Glomerulonephritis causing nephrotic syndrome. There is heterogeneity in its presentation and remitting relapsing course warrants treatment strategies based on risk stratification. Phospholipase A2 receptor antibodies (PLA2RAb) have emerged as an alternative to biopsy in selected patients and Rituximab has been added to the treatment armamentarium recently. In these times of changing paradigms in managing MN, it is essential to know the salient characteristics and therapy responses in population catered for.

Methods:
Retrospective review was conducted on all native kidney biopsies performed in our center from 2005 till 2017. 89 patients with biopsy proven primary MN were identified. Relevant clinical details were extracted from the electronic records.

Results:
Mean age of the study population was 56 years (17 to 89 years) and 63% were males. 56 (63%) patients were hypertensive.

66% of the patients had normal renal function tests (RFTs) at presentation. In terms of proteinuria, 12.4 % presented with subnephrotic, 30 % with nephrotic (3.5 to 8 grams/ day) and 47 % had more than 8 grams of proteinuria at presentation. Mean serum albumin was 24 g/L +/-8 (9g/l to 48g/l). For most patients; PLA2RAb titers were unavailable, 17% patients were PLA2rAb positive while 30 % tested negative.
Regarding therapy, 90% of the patient were treated with ACEI and quarter of the patients received anticoagulation.
42% of the patients did not receive any immunosuppression. Prednisolone alone or combined with Calcineurin inhibitors (CNI) or Mycophenolate (MMF) was offered to 16% of the patients. CNI based therapies alone or with steroids were used in 20 percent of the patients. Ponticelli regimen was used in 14 % cases. Rituximab was used in two patients.
Regarding outcomes, 35% of the patients experienced complete remission, 40 % had partial remission and 17% failed to remit. Out of the patients that failed to remit, 50 % were in the high range nephrotic group. Complete remission in 13 out of 31 patients and partial remission in 19 out of 35 patients was achieved with supportive therapy. 18 patients attained complete and 16 patient achieved partial remission with Immunosuppression. 50% of the patients had normal RFTs towards the length of follow up. Of the 10 patients that progressed to ESRD, 8 patients had deranged RFTs at the time of biopsy.
Complications included venous thromboembolism (VTE) in 6 patients, including renal vein thrombosis in 3 patients and Pulmonary embolism in 1 patient. All of these patients had albumin below 25 g/l. Cyclophosphamide intolerability and Tacrolimus related side effects were reported in one case each.

Conclusion:
Despite having a heterogeneous population, our findings are similar as described in literature. Substantial proportion of patients achieved complete or partial remission without any need for Immunosuppressive medications. When needed, Immunosuppression was relatively well tolerated and effective in inducing

remission. Proportion of patients with elevated RFTs and high degree of proteinuria had the worst prognosis. As expected, VTE is not an uncommon complication with MN and anticoagulation should be instituted in hypoalbumenemic patients.

560

Estimating Residual Kidney Function in haemodialysis patients using serum biomarkers.

Dr Raja Mohammed Kaja Kamal[1], Professor Ken Farrington[1,2], Dr Jesssal Patel[2], Professor Griet Glorieux[3], Professor Sunny Eloot[3], Professor Wim Van Biesen[3], Dr Sivakumar Sridharan[1,2], Dr Enric Vilar[1,2]
[1]Lister Hospital, Stevenage, UK, Stevenage, United Kingdom, [2]School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom, [3]Nephrology Division, Ghent University Hospital, Ghent, Belgium

BACKGROUND:
Residual kidney function (RKF) can contribute significantly to overall solute clearance in patients receiving haemodialysis (HD) and has been shown to provide a number of clinical benefits. Measurement of RKF is required to safely perform incremental dialysis but is cumbersome, entailing regular inter-dialytic urine collections. If serum markers could be used to estimate RKF it would eliminate the need for these collections. We have previously demonstrated that RKF can be estimated using serum Beta-2microglobulin (B2M) and Beta-Trace Protein (BTP). We have also demonstrated strong correlations between residual GFR and another middle molecule, Tumour Associated Trypsin inhibitor (TATI), and a number of Protein-bound solutes (PBS), particularly, Indoxyl sulphate (IS), Indole Acetic Acid (IAA). This study was carried out to ascertain whether the addition of serum levels of any of these biomarkers to models of residual GFR based on B2M and BTP, improved estimates of residual GFR.

METHODS:
We measured glomerular filtration rate GFR (mean of urea and creatinine clearance) using inter-dialytic urine collection. Pre-dialysis blood samples were collected to measure serum creatinine BTP, B2M, TATI and plasma PBS molecules in 100 HD patients. Linear regression models were constructed of residual GFR incorporating serum biomarker levels and other relevant demographic and clinical variables.

RESULTS:
Mean age of participants was 67.3 ±15.6 years. Sixty-one were male, and 74 white. Median GFR was 3.0 (IQR 4.1) ml/min. Eleven were anuric – defined as passing less than 100ml/day of urine. The best model of residual GFR based on serum B2M and BTP levels is shown in the table (adjusted R square 0.690)

We then explored adding reciprocals of measured serum levels of TATI and PBS to this model. The best improvements to the model occurred with reciprocal TATI (adjusted R square 0.701), reciprocal free Indoxyl sulphate (adjusted R square 0.707) and reciprocal free IAA (adjusted R square 0.709)

CONCLUSION:
The addition of the reciprocal of serum TATI, free IS and free IAA to a model based on serum B2M and BTP levels provided a marginally better estimate of residual GFR. Findings require confirmation in a larger group of patients and potential clinical applications explored

561

Cytomegalovirus in kidney transplant recipients: incidence, management and outcome in a District General Hospital

Dr Mark Davies[1], Emma Jones[1]
[1]*BCUHB/Bangor University, Wrexham, United Kingdom*

Introduction:

Cytomegalovirus (CMV) is a common post-kidney transplant complication, despite prophylactic regimens. In one single-centre study CMV disease occurred in 29% of kidney transplant patients at a median of 61 days after stopping prophylaxis (1).Another study suggested that the majority of CMV infections are delayed, i.e. they occur >100 days post-transplant (2). Research suggest that the biggest risk factor for CMV infection is the CMV serostatus of the donor-recipient pair (3). Whilst some CMV infections occur without symptoms or sequelae (termed CMV viraemia) others present with significant symptoms and can be associated not insignificant mortality (4). As such it is important that all centres that care for kidney-transplant patients have a protocol for screening for and effectively managing CMV infections.

Method:

We conducted an audit of CMV infections in our transplant recipients in a district general hospital caring for 200 transplant patients. Audit standards were taken from the "Second International Consensus Guidelines on the Management of Cytomegalovirus in Solid-organ Transplantation". Data was collected retrospectively between the years 2013 and 2018. Audit items included use of prophylaxis, Tacrolimus (or ciclosporin) level, other immunosuppression, CMV PCR results, symptoms, donor and recipient serostatus, treatment and outcome.

Results:

28 cases of CMV infection were identified from 2013-2018.
Descriptive statistics are shown in Table 1.
Most cases occurred over 12 months after transplantation, in patients who had therapeutic tacrolimus levels (7.3).The majority of patients (60%) identified had presented with gastro-intestinal symptoms. Only 30% received IV ganciclovir, 10% no antiviral, whilst the rest were prescribed oral valganciclovir. 70% also had a reduction/ temporary omission of anti-proliferative immunosuppression (majority MMF).
(further analysis is ongoing at this time in preparation for presentation)

Conclusion:

CMV infection is an important complication in kidney-transplant recipients. A protocol to trigger screening is warranted because of its prevalence and potential consequences. Non-specific symptoms, especially gastrointestinal upset, should prompt instigation. CMV can be effectively treated with antivirals and adjustment to immunosuppression without compromising graft function (at least in the short term examined in this audit). In our population there was a mean improvement in creatinine after CMV treatment. We are considering the changes to the latest international consensus which state that Secondary Prevention is no longer required. A future audit should examine the effect of any change in practice.

562

Enemas can be fatal in Chronic Kidney Disease. An Overlooked Fact

Dr Raja Rashid[1], Dr Zahid Nabi[2], DR Zaki Ansari[2]
[1]Uhb Nhs Trust BHH, Birmingham, United Kingdom, [2]Nephrology Department, KRL hospital, Islamabad, Pakistan

Background: Phosphate enemas are frequently used for treatment of constipation in hospitalized and out- patient settings. There are manufacturers and FDA warnings related to their potential harmful effects in selected high risk groups involving elderly frail patients, patients with bowel inflammations, chronic kidney disease (CKD) and those taking certain medications. Inconveniently, incidence of constipation is encountered much frequently in some of these groups. We are presenting a case where phosphate enema led to AKI and serious electrolyte shifts in a patient with CKD.

Case summary: 65 year old gentleman with stage IV CKD secondary to obstructive uropathy and renal stone disease was admitted with fracture neck of femur. On admission in surgery, his workup showed Creatinine 3 mg/dl, Ca 8.5 mg/dl, Phosphrous 5.2 mg/dl, Serum bicarbonate 15.9 mmol/L, Sodium 136 mmol/L, Potassium 4.7 mmol/L. He developed subacute intestinal obstruction and was given two doses of kleen enema (Phosphate enema) over 24 hours. Within few hours after the second dose, his condition deteriorated and he developed acidotic breathing, acute confusional state. Laboratory workup showed Urea 215 mg/dl, Creatinine 6.5 mg/dl, Serum bicarbonate 8.9 mmol/L, Calcium 4.4 mg/dl, Phosphrous 17.2 mg/dl , sodium 161 mmol/L, Potassium 2.5 mmol/L. He was managed with intensified daily hemodialysis with intensive supportive measures. Clinical and Lab parameters were much improved after 11 HD sessions with corrected Calcium of 8.9 mg/dl and phosphrous 4.5 mg/dl. His dialysis was subsequently stopped and he was kept under observation with a stable RFTs and biochemical profile.

Discussion: The hyperosmolar sodium phosphate based purgatives cause acute phosphate nephropathy by volume depletion, transient massive hyper-phosphatemia, chelation of calcium and precipitation of calcium phosphate in renal tubules. Once manifested, treatment is mainly supportive aimed at potentially fatal water and electrolyte shifts. Hospital staff, pharmacies, gastroenterology and surgical services should all be educated that the restraints and contraindications pertaining to phosphate enemas should be carefully reviewed in each patient. Strong caution must be exercised in patients with renal impairment where alternate preparations of enemas should be used after exhausting all safer non-pharmacological and pharmacological measures.

563

Reason for hospitalization of hemodialysis patients outside the nephrology department: Study over 10 years

Dr Imane Failal[1], Dr Sanae Ezzaki[1], Pr benyounes ramdani[1]
[1]*Chu Ibn Roshd, Casablanca, Morocco*

Introduction:
Chronic end-stage renal disease is a major public health problem in Morocco. This is the result of a steady increase in its incidence and prevalence. It has a heavy economic impact and has a considerable impact on the quality of life of patients. And hospitalization has a major impact on the morbidity and mortality of chronic hemodialysis patients (HDC) with an increase in their cost of care. The objective of our work is to study the indications and the course of hospitalizations as well as the factors linked to the intra-hospital mortality of chronic hemodialysis patients.
Patients and methods
This is a retrospective study concerning 1535 patients with end-stage chronic renal disease admitted to the CHU for a period of 10 years, ranging from January 1, 2008 to December 31, 2018. The parameters were studied from the on-call register of the nephrology department.
Results
A total of 1,535 HDCs were admitted to the various services and benefited from a total of 3,382 HD sessions. with an average age of 49.8 years, and a slight male predominance with a sex M / F ratio of 1.11, the antecedents were dominated by diabetes (33.18%) and hypertension (32.28%).%), the reasons the most frequent primary admissions were OAP (16.5%), followed by disturbances of consciousness (15%), then hyperkalemia (10%) Hospitalization was urgent in more than 50% of HDC, and scheduled for the rest.
A total of 65% of the IRCT were hospitalized in the various medical, surgical and intensive care units of the emergency reception service (SAU). The latter represents the main hospitalization site for our patients. Almost half of our patients came from this service (508 patients, or 48.87%). 20% of patients were hospitalized in medical hospitalization services, The main service in this group and from which came was the cardiology. patients came from surgical departments, i.e. 18.1% followed by the infectious diseases department. 29 patients came from pediatric departments, i.e. 1.8%. 20 patients from the maternity ward (gyneco-obstetrics), i.e. 1.3% only and 12% were hospitalized for surgical etiologies.
Mortality is 16.8%. Mortality factors: sepsis and disturbances of consciousness.
Discussion
Due to their status as chronic hemodialysis patients, our patients are subject to several infectious, hemorrhagic, neurological and vascular complications leading to their hospitalization. Their vital prognosis is mainly conditioned by the occurrence of neurological damage or septic shock.
Conclusion
the impact of chronic hemodialysis patients, hence the need for adequate preventive and therapeutic treatment, to improve intra-hospital mortality.

565

Patient preference for Nephrology outpatient clinic letters: to me or not to me?

Dr Dominic DE TAKATS[1,2], Dr Kerry Tomlinson[1], Dr Helen Alcock[1], Dr Daniela Farrugia[1], Dr Richard Fish[1], Dr Mark Lambie[1,2], Dr Madhu Menon[1], Dr Christopher Thompson[1], Dr Andrew McClean[1]
[1]University Hospitals of North Midlands, Stoke-on-Trent, United Kingdom, [2]Keele University School of Medicine, Stoke-on-Trent, United Kingdom

Introduction

The academy of Medical Royal Colleges has said in its guidance on writing outpatient clinic letters for patients that it is in keeping with best practice to write directly to patients following outpatient apointments, with a copy of the letter sent to the General Practitioner (GP).[1] Until recently it has been our unit's accepted practice to write to each patient's GP and send a copy of this letter to the patient. This was based on a survey of patient preferences in 2011 (see table). Changing the recipient of the letter changes the way clinicians write letters: they have to use non-medical language, choosing words and phrases that patients understand more readily. It is hoped that this reduces the time GPs spend explaining clinic letters to patients and will result in patients more fully understanding decisions about their diagnoses and treatments. This creates the potential for patients to become more actively engaged with their care, thereby improving adherence to mutually negotiated and agreed treatment plans. Though these potential advantages are clear, we felt uncomfortable with changing a practice that had been supported by a majority of our patients so we decided to repeat our survey.

Method

We used a simple questionnaire to ask 372 patients attending a variety of nephrology outpatient appointments in three hospitals, whether they would prefer the clinic letter following their appointment to be written to their GP with a copy to them; written to them with a copy to their GP or written to their GP only.

Results

We do not have demographic data for 2011. In 2019, 223 respondents were male, 144 were female and gender was not specified for 5. The majority of respondents were older than 61 years (250/372). Five replies were uninterpretable. Responses are shown in the table.

In 2019 the preference for sending the clinic letter to the GP with a copy to the patient held true for patients in each of general nephrology, transplant and low GFR clinics.

Discussion

In 2019, the majority of patients still expressed a preference for clinic letters to be sent to their GP and copied to them. This could be because they were comfortable with the status quo and saw no reason to change, but in 2011 patients supported a change in clinic practice. The proportion of patients not wanting to see a copy of their clinic letter has gone down, perhaps due to familiarity with the process. Also, the constituency will inevitably have changed over the 8 years between surveys; perhaps we just tracked social change.

This survey raises interesting questions as the whether we should stick to the practice of writing to the GP as patients say they want, or adopt a practice which may be better for them. Which approach is more patient-centred?

Conclusion

It is clear that the question of best practice on addressing clinic letters is not yet settled.

567

Long term maintenance rituximab for ANCA-associated vasculitis: infection and relapse prediction models

Dr. Mark Mcclure[1], Dr. Yajing Zhu[2], Dr. Rona Smith[1], Dr. Joanna Tieu[1], Dr. Seerapani Gopaluni[1], Professor David Jayne[1], Dr. Jessica Barrett[2], Dr. Rachel Jones[1]

[1]Vasculitis and Lupus Clinic, Addenbrooke's Hospital, Cambridge University Hospitals , Cambridge , UK, [2]MRC Biostatistics Unit, University of Cambridge, Cambridge, UK

Introduction

Following a maintenance course of rituximab for AAV, relapses occur on cessation of therapy, and further dosing is considered. This study aimed to develop relapse and infection risk prediction models to help guide decision making regarding extended rituximab maintenance therapy beyond a two-year rituximab treatment course.

Patients and methods

Patients with a diagnosis of AAV who received between 4 and 8 grams of rituximab as maintenance treatment between January 2002 and January 2018 were included in this study. Separate risk prediction models were derived for the outcomes of relapse and infection. Multivariable Cox proportional hazards models were fitted to each outcome using clinically relevant predictors at two key time points: firstly, at the time of last rituximab and again 12 months after the last rituximab.

Results

147 patients were included in this study with a median follow up of 29 [IQR 15-56] months. 80 patients experienced a relapse, with a median time to relapse of 45 months following last rituximab. There were 88 infectious events (events defined as one serious or three non-serious infections) with a median time to infection of 44 months.

Relapse. Seven baseline predictors were retained in the final model for relapse prediction when assessed at time of last rituximab. ENT involvement was the strongest predictor of relapse (HR 2.76 [95% CI: 1.3-5.8], p=0.008). The optimism-corrected c-index was low (c-index = 0.54), indicating that discrimination between individuals was poor; however, discrimination could be achieved by grouping patients into low-risk and high-risk groups which have a median time to relapse of 72.2 months and 29.4 months, respectively. For prediction performed 12 months post last rituximab, ANCA positivity became a strong predictor of a relapse (HR 2.73 [95% CI 1.56-4.80], p<0.001). The ability of the later model to discriminate relapse risk between individual patients improved (optimism corrected c-index = 0.65). Grouping of patients into low, medium and high risk of relapse was possible. Median time to relapse was 113 months, 43.6 months and 22 months for the low, medium and high-risk group, respectively.

Infection. At time of last rituximab, five predictors were retained in the final model. The presence of structural lung disease (HR = 1.83 [1.17-2.90], p=0.008), diabetes (HR=2.72 [1.65-4.50], p<0.001), the occurrence of infections during rituximab treatment (HR=2.32 [1.29-4.20], p=0.005) and lower serum IgG level at the end of rituximab (HR=0.71 [0.56-0.90], p=0.005) were significantly associated with infection. The optimism-corrected c-index was 0.64 allowing discrimination between low, medium and high risk of infection groups. Median time to infection was 78 months, 65 months and 27 months for the low, medium and high-risk groups, respectively. At 12 months post rituximab, the predictive power of the presence of lung disease (HR=1.95 [1.16-3.26], p=0.011), diabetes (HR=2.82 [1.57-5.05], p=<0.001) and lower serum IgG level (HR=0.75 [0.57-0.99], p=0.044) was strong but the discriminability of the final model was marginally

worse than previously (optimism-corrected c-index = 0.63). Once again, clear separation of patients from three risk groups was observed, where median time to infection was 74.8 months, 51.8 months and 31.8 months for the low, medium and high-risk group, respectively.

Conclusion

The ability to identify risk groups may help inform decisions regarding the potential risk benefit of ongoing rituximab treatment beyond a two-year treatment course.

568

Developing and implementing a patient centered approach designed to improve outcomes for those who struggle to attend for or engage with haemodialysis services.

Mr Simon Gray[1]
[1]*Salford Royal NHS Foundation Trust, Salford, United Kingdom*

Patients who fail to attend for haemodialysis are at significant risk of deterioration or death due to non-engagement with essential life sustaining therapy yet despite this fact, non-attendance remains an issue for patients and services across the country.

This presents Renal Services with a unique safeguarding concern for each patient whose circumstances will be varied case by case coupled with a lack of support services as this cohort is classed as outpatients thus are unable to access many Trust services which are commissioned for inpatients.

The aim of this project was to develop a patient centred engagement strategy to improve the outcomes for patients who struggled to attend for or engage with haemodialysis services.

We sought to identify those most at risk who continually fail to attend or engage with the service in an effort to explore the reasons for this non-engagement.

Phase 1 was the development and implementation of a robust approach to standardise the actions taken by staff when a patient fails to attend in an effort to ensure patient safety. This approach was designed to manage all patients who fail to attend for haemodialysis.

Phase 2 was the development and implementation of a patient engagement strategy within the local multi-disciplinary team to support those patients who fail to make improvements in engagement who are then classed as Complex Recurrent Non-attenders, to explore reasons for continued non-attendance, identify barriers to attendance and compliance and offering support to overcome such hurdles.

Phase 2 has been piloted with patients who fall within the Complex Recurrent Non-attenders cohort using a PDSA methodology which has demonstrated positive results of improved attendance & an improved relationship between patients and staff which has resulted in establishment of an open dialogue with this cohort.

A key aspect of the success of this phase was an approached based upon allowing the patient to identify barriers to attendance and agreeing collaboratively how we as a team (Patient, Nurse, Clinician) overcome those barriers. Many patients were grateful for the inclusion (with consent) of close family members during this phase of the project.

Phase 3 is the involvement of mutli-agency support services who are able to provide access to community based services and support with social issues.

Phase 3 is ongoing and poses challenges due to multi-agency support services differing based on each patient local and support offered by the Clinical Commissioning Group and Adult Social Care services.

Phase 4 will expand this approach to a cohort of patients who are non-concordant when they attend and insist on cutting short time on haemodialysis.

Phase 5 will be the development of contracts of care with both patient cohorts outlining the expectations of the patient and in turn to expectations of the service to foster collaborative working and empower patients improve attendance and engagement.

Phase 4 & 5 are targeted to be designed and implemented by the summer of 2020.

569

Atypical Presentation of Anti GBM Disease with Co Existent Membranous Nephropathy – Case Report

Dr Nishamanie Karunasena[1], Dr Yasser Al-Mula Abed[1], Dr Lisa Willcocks[1], Prof David Jayne[1]
[1]*Renal Department, Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom*

Background: Anti Glomerular Basement Membrane (GBM) disease is characterised by auto-antibodies against an antigen intrinsic to the basement membrane of the glomeruli and alveoli. Presentation is typified by a rapidly progressive glomerulonephritis and 40-60% of cases will have concurrent pulmonary haemorrhage. Indolent presentation with haemo- proteinuria and minimal renal dysfunction is not well reported.

Case Report: A 17 year old male, an active smoker, presented with a prodrome of fever, fatigue and weight loss of one month duration. He had two episodes of macroscopic haematuria initially; No haemoptysis. Clinical examination was unremarkable except for cervical lymphadenopathy. Investigations showed slightly elevated creatinine at 105 umol/L, mild transaminitis and reactive lymphocytosis. Urinalysis showed 3+ blood and protein with urinary albumin:creatinine ratio (ACR) of 127 mg/mmol. Monospot test was positive. Hence Infectious Mononucleosis was diagnosed. Further tests showed anti GBM titre of 11 iu/ml (0-7 iu/ml) with Anti Streptolysis O Titre of 400 unit/ml, normal C3 and C4 levels. ANCA and ANA were negative. He subsequently underwent renal biopsy - From a total of 27 glomeruli, segmental necrosis seen in one glomerulus, fibrocellular segmental lesion in two, and fibrocellular crescents in two. Another glomerulus showed a fibrous crescent. Fifteen glomeruli were hypercellular with segmental areas of mesangial and/or endocapillary proliferation. Immunohistochemistry showed linear staining of GBM with IgG4, IgG and C1q. IgA and C3c were negative. These features were in keeping with anti-GBM disease. Electron microscopy showed subepithelial deposits consistent with co-existent membranous glomerulopathy (MN). When biopsy result was available, the anti-GBM titre was at 6 iu/ml and creatinine had normalised to 85 umol/L. However, he continued to have haemo-proteinuria with urinary ACR of 95 mg/mmol. Anti-PLA2R antibodies were negative. The patient was treated with oral Prednisolone and started on an increasing dose of Mycophenolate Mofetil to 1g twice daily. Subsequent anti GMB titre was 1iu/ml.

Discussion: In this case, fever and constitutional symptoms were likely due to Infectious Mononucleosis. The main clinical differentials for the renal abnormalities were IgA nephropathy vs post infectious glomerulonephritis. However, the raised anti-GBM titre, confirmed twice with a peak of 11 IU/ml, was of great concern given the aggressive nature of anti-GBM disease. Renal pathology appearances were of anti-GBM disease although showing atypical features with focal glomerular lesions and co existent MN. The production of anti-GBM antibodies is thought to be in response to an unknown inciting stimulus and may precede the onset of clinical signs and symptoms by many months. In our case, Infectious Mononucleosis possibly triggered formation of anti-GBM antibodies. The decision to initiate immunosuppress here was based on crescentic glomerular disease, in the context of anti-GBM antibodies with the potential to cause a rapidly progressive glomerulonephritis.

Conclusion: Our case showed co-existent anti-GBM disease and MN in renal biopsy in the context of Infectious Mononucleosis which to our knowledge is not previously reported in literature. Although the presentation in this case was indolent, biopsy confirmed the onset of crescentic glomerular disease warranting immunosuppression. The outcome was excellent, with disappearance of the pathogenic anti-GBM antibodies.

570

The National Study of MPGN and C3G: clinicopathological characteristics and outcomes

Dr Layla Buckham[1], Dr Edwin Wong[2], Hannah Lomax-Brown[3], Dr Stephen Marks[4], Matthew Pickering[3], Claire Harris[5], Terry Cook[3], Dr Sally Johnson[1,2]

[1]Great North Childrens Hospital, Newcastle Upon Tyne, United Kingdom, [2]National Renal Complement Therapeutics Centre, Newcastle upon Tyne, United Kingdom, [3]Imperial College , London, United Kingdom, [4]Great Ormond Street Hospital, London, United Kingdom, [5]Institute of Cellular Medicine, Newcastle University, Newcastle upon Tyne, United Kingdom

Introduction

Primary forms of membranoproliferative glomerulonephritis (MPGN) and C3 glomerulopathy (C3G) are rare diseases that associate with abnormalities of complement dysregulation. Progressive renal failure is common, with median time to end-stage renal disease (ESRD) typically around 10 years. There are no proven treatments.

The National Study of MPGN/C3G builds on the National Registry of Rare Kidney Diseases (RaDaR) in order to phenotype individuals with this rare disease, to increase disease understanding and highlight potential therapeutic strategies. Collaboration between renal units across the United Kingdom and the MPGN/C3G Rare Disease Group has facilitated the development of a large cohort of patients. This report describes the phenotype of patients recruited between 2014 and 2017 according to pathological findings, clinical presentation and treatment received. This dataset and associated biological samples collected during this phase of the study are being used to assess potential therapeutic targets in collaboration with pharmaceutical companies.

Methods

Patients from 31 renal units were consented into the National Study of MPGN/C3G. Clinical data was obtained from the UK Registry for Rare Kidney Diseases (RADAR) and direct requests for information from electronic record systems and patient notes to the recruiting sites. Central review of biopsy material and report was performed to confirm a diagnosis. Serum and plasma was collected for detailed complement analysis.

Results

Over 250 patients have been recruited to the National Study of MPGN/C3G, of which 184 patients have been recruited between 2014 and 2017. 52.3% of patients were male. Mean age of presentation was 26.4 years of which 25.5% of patients presented under the age of 18.

Complete central pathology review was available for 80 patients, of which 59 had immune complex MPGN, 15 has C3 glomerulonephritis and 6 had dense deposit disease.

Of the 184 patients, clinical presentation was with proteinuria (95.0%, n=75), haematuria (95.8%, n=48), hypertension (44%, n=64), low albumin (78.2%, n=78) and renal failure (61%, n=78).

C3 and C4 were low in 56% (n=50) and 43.8% (n=48) respectively. Data for C3 nephritic factor was available in 26 cases, 14 were positive.

Angiotensin converting enzyme inhibitors and angiotensin receptor blockers were the most commonly used antihypertensives. Prednisolone and mycophenolate were the most commonly used immunosuppressant agents.

53 patients (42%, n=125) progressed to ESRD. The median time to ESRD in this cohort was 6 years 8 months (range 0 years to 48 years).

Discussion

We report a cohort of patients with IC-MPGN, DDD and C3GN. RaDaR has facilitated data collection that has allowed detailed clinical characterisation. Outcomes reported in this cohort are poor, and are consistent

with previous data. Samples collected prospectively for this cohort may provide insight into disease mechanisms and useful therapeutic targets.

571

Mepolizumab therapy in Eosinophilic Granulomatosis with polyangiitis (EGPA) - A one-year follow-up study using anti-IL5 as a steroid sparing therapeutic approach.

Dr Allyson C Egan[1], Dr Pasupathy Sivasothy[1], Dr Robin Gore[1], Dr Marcos Martinez Del Pero[1], Dr Rona Smith[1], Dr Lisa Willcocks[1], Dr Rachel Jones[1], Sr Caroline Owen[1], Sr Stella Burns[1], Professor David Jayne[1]
[1]*The Vasculitis and Lupus Service, Addenbrookes Hospital, University of Cambridge, Cambridge, UK*

Background and Aims:

EGPA is a small vessel vasculitis characterised by the presence of tissue eosinophilia, necrotising vasculitis and granulomatous inflammation1. Typically, a prodromal asthmatic phase, leads to an eosinophilic stage, which can evolve to include the presence of vasculitis with renal manifestations. In the recent randomised, placebo-controlled MIRRA trial for relapsing and refractory EGPA, adjuvant therapy with anti-IL5 mAB Mepolizumab [MEPO] at 300mg s/c monthly, accrued longer times in remission, reduced steroid exposure and reduced relapse rates2. The aim of our study was to analyse the response and outcome for EGPA patients who received 100mg s/c of MEPO monthly for a minimum of 52 weeks, with particular focus on the steroid minimisation benefits.

Method:

This retrospective, descriptive study analysed 13 patients with EGPA, who received 100mg s/m monthly MEPO therapy under the eosinophilic asthma care-pathway. Time points of assessment included MEPO commencement [M0] and 12 [M12] months.

Results

One patient had MEPO switched to Rituximab to treat both EGPA and new onset rheumatoid arthritis. continued on concurrent conventional immunotherapies.

Conclusion:

The relapsing nature of EGPA places a potential dependency of therapy on steroids for asthmatic and vasculitic flares. This underscores the importance of targeted pathway specific biologic therapy to minimise steroid exposure, prevent tissue damage and ensure early response to therapy. This study demonstrates that anti-IL5 serves as a favourable model with steroid minimisation, improvement in asthma control questionnaire, reduction in BVAS and eosinophil counts at the 100mg s/c dosage. ANCA positive serology normalised in all four patients, independent of subtype. Well tolerated, it demonstrated considerable clinical benefit, with 12 patients [92.3%] continuing anti-IL5 therapy beyond 12 months. Adjuvant therapy with conventional immunosuppressants was well tolerated and renal function was preserved.

1. J.C.Jenette, et al Revised International Chapel Hil Consensus Conference Nomenclature of Vasculitides. 65, 1–11 (2013).
2. Wechsler, M. E. et al. Mepolizumab or Placebo for Eosinophilic Granulomatosis with Polyangiitis. N. Engl. J. Med. 376, 1921–1932 (2017).

Figure:

573

Repeated intravenous immunoglobulin treatment for recurrent parvovirus induced red cell aplasia in an immunosuppressed renal transplant recipient.

Dr Jenny Whitehead[1], Dr Emma Montgomery[1]
[1]*Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle, United Kingdom*

Background
Parvovirus has five classical clinical presentations including erythema infectiosum (fever and rash mainly in children), arthropathy, transient aplastic crisis, fetal infection and red cell aplasia. Red cell aplasia is more commonly associated with immunosuppressed patients including the transplant population.

Case Presentation
We present a 56 year old caucasian female with recurrent red cell aplasia secondary to parvovirus. She received a DBD renal transplant in April 2019 with a HLA mismatch 1:1:1. She received basiliximab induction was maintained on Tacrolimus, Mycophenolate Mofetil (MMF) and Prednisolone. She presented several weeks after transplant with recurrent anaemia requiring multiple blood transfusion and a low reticulocyte count of 1.8. Her parvovirus serology (IgM and IgG) was negative but her parvovirus PCR was raised at 157 billion units/ml.

Treatment
She was treated with intravenous immunoglobulin (IVIG). After a review of the literature we administered Privagen 2g over 5 days based on ideal body weight. The patient was counselled regarding the risks and written consent completed. Her MMF was discontinued and her Tacrolimus dose reduced to aim for lower therapeutic levels. The patient was discharged with regular haemoglobin and parvovirus PCR monitoring as an outpatient. Initially her haemoglobin level improved and the parvovirus titre decreased to 1020 units/ml. However four months after the initial IVIG treatment, her haemoglobin dropped again and the parvovirus titre relapsed to 178 billion units/ml . The patient was readmitted to hospital. Transfusion was not required during this admission and she was treated promptly with a second course of IVIG.

Outcome
The patient continues to have outpatient monitoring. Her haemoglobin has again improved and the parvovirus titre is falling. She also had an episode of CMV viremia in December 2019 which resolved with augmentation of her immunosuppression and treatment with valgancyclovir. Her MMF was not restarted and she continues on Tacrolimus and Prednisolone with stable renal function.

Discussion
Parvovirus should be considered in all anaemic immunosuppressed patients and investigated with PCR as serology may often be negative. Continued monitoring is important to detect a relapse in anaemia and parvovirus viremia as repeated courses of IVIG treatment may be required. Literature would suggest that patients require a mean of 2.7 courses of IVIG and relapse is most common at 4.3 months on average post treatment (1).

Reference

1) Crabol Y, Terrier B, Rozenberg F, et al. Intravenous immunoglobulin therapy for pure red cell aplasia related to human parvovirus b19 infection: a retrospective study of 10 patients and review of the literature. Clinical Infectious Diseases, Volume 56, Issue 7, 1 April 2013, Pages 968–977

574

A review of the “MEST-C” score in IgAN

Dr Amy Hudson[1], Dr Aine De Bhailis[1], Dr Smeeta Sinha[1]
[1]*Salford Royal Foundation Trust, Manchester, United Kingdom*

Background:
IgAN is the most common glomerular pathology worldwide. In addition to BP, proteinuria and eGFR at presentation, the MEST criteria were published in 2009 to assist with histological classification and disease prognostication. The IgAN Nephropathy Classification Working Group added a fifth parameter; “C” crescent score. It is well accepted that BP control with renin-angiotensin system inhibition (RASi) is the cornerstone of IgAN management. The appropriate use of immunosuppression remains an area of debate. The aim of this retrospective study, was to review those biopsies with positive “C” scores.
Methods:
A list of all renal biopsies performed in our centre over a twenty-year period (January 2000 – January 2020) was collated. Form a total of 3555 biopsies performed, 525 had a diagnosis of IgAN. Each of these biopsies were reviewed including their MEST scores and baseline demographic and laboratory data; therapeutic strategies and outcomes were analysed.
Results:
A total of 34 biopsies had a positive “C” score (C1 or C1). These 34 biopsies were done in 32 patients. (2 of the patients had 2 biopsies). All 34 were native kidney biopsies. Males accounted for 59% of the cohort. The mean age of biopsy was 46 years (ranging from 18-90years). Indication for biopsy included: 38% for Haemato-proteinuria and renal impairment; 29% were for HSP-type presentations; 14% had nephrotic syndrome at presentation. 70% had C1 scores; 30% had C2 scores. The mean number of glomeruli in each biopsy was 15 (ranging from 5-38).
With regard to treatment strategies, 78% of patients received RASi and 85% received immunosuppressive therapy. These treatment strategies included intravenous cyclophosphamide, prednisolone monotherapy, MMF and prednisolone in combination, and azathioprine in conjunction with steroids. A total of 62% of patients received dual therapy in the form of both RASi and immunosuppression.
At the time of biopsy, the mean creatinine was 297 umol/l (ranging from 47-880) and mean UCPR was 587g/l (ranging from 70- 1863). 40% of the cohort reached ESKD during follow-up. There was a 28% mortality within the cohort. There was an 18% 1-year mortality; 2 deaths were attributable to sepsis; one death was attributable to unrelated pulmonary fibrosis; the cause of death in the remaining three patients were unknown.
Conclusion:
Crescentic IgAN is defined as >50% crescentic glomeruli on kidney biopsy. It is well documented that crescentic IgAN, a rare phenotype, has a poor prognosis; often presenting as rapidly progressive glomerulonephritis. Little is known about those patients which have evidence of crescents of their biopsies, but that do not meet criteria for “crescentic IgAN”. Our small study gives real-world outcomes in those that have evidence of crescents on their biopsies. This data confirms that this cohort warrants close surveillance.

575

Acute Kidney Injury following heart, lung and combined heart-lung transplantation

Dr Ranvir Cheema[1], Mr Andrii Kolesnyk[3], Dr Sern Lim[4], Dr Carla L. Richardson[2], Dr Dimitrios Chanouzas[1]
[1]Department of Renal Medicine, University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [2]Department of Critical Care, University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [3]Department of Health Informatics, University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [4]Department of Transplantation, University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom

Introduction

Heart and lung transplantation provide definitive treatment for advanced heart failure and end-stage pulmonary disease respectively1. Pulmonary disease often co-exists with cardiac pathology, thus combined heart-lung transplantation is indicated in patients with dual-organ failure2.

Acute Kidney Injury (AKI) commonly occurs after solid organ transplantation and is reported to be associated with reduced graft and patient survival3. Nevertheless, there is wide variation in the reported incidence of AKI following heart, lung and combined heart-lung transplantation. AKI is reported to occur in 6.7 – 76% of patients, and AKI requiring some form of renal replacement therapy in 0.6 – 29%. In addition, few studies have investigated dialysis dependent AKI following heart, lung or heart-lung transplantation. We have evaluated the incidence of AKI, dialysis dependent AKI and renal recovery in a large cohort of heart, lung and heart-lung transplant recipients from a tertiary referral centre.

Methods

We conducted a retrospective study, evaluating records of all patients that had a heart, lung or combined heart-lung transplant at a tertiary referral centre, between January 2010 and January 2020. Patients with end stage renal failure prior to transplantation were excluded. Data was extracted from the hospital's electronic patient records and anonymised. AKI stage was calculated using the NHS England AKI algorithm8, based upon the KDIGO definition of AKI9. Use of RRT in critical care was not evaluated. Inpatient ward based intermittent haemodialysis data was collected, along with renal outcomes at discharge and 3 months post discharge. Data analyses were carried out using Microsoft Excel, SPSS and GraphPad Prism.

Results

A total of 416 patients received a heart, lung or combined heart-lung transplant in the period studied, out of which 412 patients met our inclusion criteria.

82% of the entire study group were noted to develop AKI post-transplant, 80% of heart transplant patients, 84% of lung transplant patients and 100% (n=8) of combined heart-lung transplant patients. 25% of patients developed AKI stage I, 30% AKI stage II and 28% AKI stage III. 9% (n=36) of patients did not recover from their AKI post Critical Care discharge and received at least 1 session of ward based intermittent haemodialysis (10% -21/233 heart transplant patients, 7% - 12/171 lung, 37.5% - 3/8 combined heart-lung transplant patients). Analysis of renal outcomes at hospital discharge and at 3 months post-discharge as well as predictors of AKI and dialysis dependent AKI is on-going.

Discussion

Our findings demonstrate that AKI is an important complication of heart, lung and combined heart-lung transplantation. AKI in such cases is likely multi-factorial. Respiratory failure is common post heart and lung transplantation. This inflammatory response can contribute to cytokine mediated AKI and multi-organ failure5,6. Renal ischaemia is also compounded by haemodynamic instability, prolonged cardiopulmonary bypass runs during cardiothoracic surgery and the nephrotoxic effect of calcineurin inhibitors, diuretics, antibiotics and other drugs used in the post-operative period7.

Our study forms the largest UK based series investigating AKI following heart, lung and combined heart-lung transplantation and confirms that AKI as well as dialysis dependent AKI is a significant post-operative complication.

577

Evidence for IgG4 and ANCA disease association. A case study of MPO positive vasculitis with IgG4 positive plasma cells on renal biopsy in a patient with a background of pancreatic IgG4 disease.

Dr Jenny Whitehead[1], Dr Emma Montgomery[1], Dr Phillip Thompson[1]
[1]*Newcastle upon Tyne NHS Foundation Trust, Newcastle, United Kingdom*

Background
Both IgG4 related disease and ANCA vasculitis can affect several different organs and both may present with general systemic symptoms such as fever, weighloss mylaigia but also lung, renal and GI involvement. Both are rare conditions.

Case Presentation
We present a case report of a 64 year old woman. She has a past medical history of Graves diseae, Cerebrovascular disease and Diabetes. She presented in 2017 to the hepatobiliary team with loose stool and abdominal pain. Endoscopic ultrasound showed a dilated CBD proximal to a stricture and an abnormal pancreas. A biopsy showed a chronic pancreatitis with probable IgG related autoimmune pancreatitis. Her IgG4 titres were raised but as she remained stable she was not treated with corticosteroids. Her creatinine at this time was 61mmol/l with an eGFR >90.

In September 2019 she presented to the Gastroenterology outpatient clinic feeling unwell. She was admitted to a local hospital with raised inflammatory markers and an acute kidney injury (AKI) with a creatinine of 200mmol/l. She was transferred to the renal unit for further investigation. She had symptoms of sinus pain, myalgia, shortness of breath and a cough. Her IgG4 levels were raised at 5.73 g/l (normal < 1.35 g/l). However her MPO level was now positive at >8 with a PR3 <0.2. Her urine dip showed 1+ protein and 2+ blood.

She proceeded to a renal biopsy which demonstrated features consistent with a pauci-immune crescentic glomerulonephritis with segmental necrotising lesions and approximately 65% crescents. In addition, there were significant numbers of IgG4 positive plasma cells, with an IgG4/IgG ratio of greater than 40%, in keeping with renal involvement by the known IgG4 related disease. There was moderate chronic tubulointerstitial damage.

She received IV methylprednisolone followed by oral Prednisolone 60mg daily prior to the biopsy along with Cyclophosphamide.

During her admission she developed a left hemiparesis and expressive dysphasia. Her MRI head showed bilateral acute infarcts in multiple territories with established old infarcts. MRA showed no intracranial vessel abnormality.

Outcome
Gradually her neurological symptoms and renal function continued to improve. Her latest results show an improved creatinine of 170mmol/l with eGFR 27. Her MPO titre has reduced to 5.0 and IgG4 is now within normal range at 0.98.

Discussion

This is a case of combined clinical and histological features of an ANCA associated crescentic glomerulonephritis and IgG4 related disease. There is only a few published reports of similar IgG4 and ANCA positivity however this appears to be the first case with both histological changes being present in the kidney.

578

Cholesterol Crystal Embolism Presenting as AKI and Pancreatitis - Case Report -

Dr Yasser Al-Mula Abed[1], Dr Nishamanie Karunasena[1], Dr Anil Chalisey[1]
[1]*Cambridge University Hospitals NHS Foundation Trust, CAMBRIDGE, United Kingdom*

Background:
Cholesterol crystal embolism (CCE), also known as cholesterol embolization syndrome, refers to aterio-arterial embolism of cholesterol crystals or small pieces of atheromatous material from atherosclerotic plaque, usually from the aorta but occasionally from other arteries. This can result in partial or total occlusion of small arteries, leading to tissue or organ ischaemia.

Case Report:
A 64-year-old English gentleman presented with severe back pain of few weeks duration. He hasd high BMI but no other medical co-morbiditiess and had never smoked in his life. He was found to be severely hypertensive with a systolic blood pressure above 240 mmHg. Investigations revealed a severe stage III, oligo-anuric, AKI requiring renal replacement therapy and severe thrombocytopaenia with a blood film showing a few red cell fragments. He had a raised troponin consistent with a myocardial event, and his amylase and lipase were also elevated, leading to a clinical diagnosis of pancreatitis. Renal US showed un-obstructed normal sized kidneys. Subsequent CT imaging, performed to exclude aortic dissection, revealed widespread atheromatous disease of the entire aorta and iliac arteries, enlarged mediastinal and abdominal/pelvic lymphadenopathy in keeping with malignancy, and subtle sclerotic bone lesions. A PSA done in context of these findings came back at 604 ug/l leading to a diagnosis of metastatic prostate cancer, for which hormonal therapy was started. Based on his initial findings, a working diagnosis of TTP was made, and he commenced plasma exchange therapy. However, his ADAMTS13 came back normal, and so the diagnosis was revised to TTP secondary to pancreatitis or paraneoplastic as a result of prostate cancer. With this in mind, his PLEX was discontinued, and following this and with control of his blood pressure, his thrombocytopaenia resolved. However, he remained dialysis-dependent. A renal biopsy was initially delayed by a significant upper gastrointestinal bleed with endoscopy showing diffuse erosive duodenitis and a bleeding ulcer. Once this had settled a subsequent renal biopsy showed cholesterol emboli with acute and subacute tubular injury, and importantly, no thrombotic microangiopathy. Unfortunately, he remains dialysis dependent with no recovery.

Discussion:
This case is in keeping with CCE. Our patient has extensive atheromatous disease, and CCE is known to present with thrombocytopaenia and end-organ damage; in particular AKI and pancreatitis (which explains the back pain) are both recognised. Upper gastrointestinal bleeds are also common and are often secondary to infarction resulting from occlusion of small vessels. His undiagnosed hypertension is a risk factor for atherosclerosis and in this presentation has been exacerbated by his back pain. Obesity is another risk factor. The prognosis correlates with the degree of the underlying atherosclerosis and is overall poor. The prostate cancer here is likely to be an incidental diagnosis which has been picked up at the same time.

Conclusion:
CCE typically happens following arteriography, cardiac catheterisation, vascular surgery, trauma to the abdomen or over anti- coagulation. The diagnosis was more difficult in our patient as he did not have any of these prior to presentation. Lab testing is generally nonspecific and definitive diagnosis depends upon pathologic specimens.

579

The cellular immune response to Cytomegalovirus is associated with expansion of CCR2 expressing monocytes that in turn are linked to increased proteinuria in patients with ANCA associated vasculitis

Dr Nadya Wall[1,3], Dr Daisy Flanagan[1], Dr Catherine King[1], Dr Alexandra Godlee[1], Dr Matthew Morgan[1,3], Professor Paul Moss[1,4], Professor Lorraine Harper[1,3], Dr Dimitrios Chanouzas[1,2]

[1]Renal Department, Queen Elizabeth Hospital Birmingham, University Hospitals Birmingham, Birmingham, United Kingdom, [2]Institute of Inflammation and Ageing, University of Birmingham, Birmingham, United Kingdom, [3]Institute of Clinical Sciences, University of Birmingham, Birmingham, United Kingdom, [4]Institute of Immunology and Immunotherapy, Birmingham, United Kingdom

Background

We have previously shown that subclinical reactivation of cytomegalovirus (CMV) drives the expansion of CMV specific T-cells such as CD4+CD28null T-cells in patients with ANCA associated vasculitis (AAV). Expansion of CD4+CD28null T cells in AAV is in turn linked to decreased renal function, increased arterial stiffness and increased mortality.

Recent evidence in diabetic kidney disease suggests that expansion of pro-inflammatory monocyte subsets, such as CCR2 expressing monocytes, is associated with arterial inflammation, as well as proteinuria and renal injury. CCR2 blockade ameliorates inflammation and renal injury in diabetic mice and has shown promise in reducing proteinuria in phase 2 clinical trials in diabetic kidney disease.

We hypothesized that subclinical reactivation of CMV may be associated with differential expansion of monocyte subsets and CCR2 expression in patients with AAV, and that this may contribute to arterial stiffness and renal injury.

Methods

Cryopreserved peripheral blood mononuclear cell samples from 32 CMV seropositive AAV patients with stable disease that took part in a previous study were stained with monoclonal antibodies to assess expression of CD3, CD56, CD14, CD16, CCR2 and CX3CR1 in order to enumerate classical (CD14++CD16-), non-classical (CD14+CD16++) and intermediate (CD14++CD16+) monocytes, as well as CCR2 expressing monocytes.

Paired data from the same patients and time-point were available for CMV-specific T-cell percentage (determined by CD4 T-cell interferon-γ secretion following overnight CMV lysate stimulation), CD4+CD28null T-cell percentage (a marker of recent subclinical CMV reactivation), plasma concentration of monocyte chemoattractant protein 1 (MCP-1), carotid to femoral pulse wave velocity (PWV; arterial stiffness), peripheral pulse pressure, serum creatinine and eGFR, and urinary albumin creatinine ratio (ACR). Flow cytometry data were analysed using DIVA Version 7 software. Analyses were conducted using SPSS Version 21.

Results

The size of the CD4+CD28null T-cell expansion was correlated with CCR2 expressing monocytes (rho=0.390, p=0.030). CMV-specific T-cell percentage also correlated with CCR2 expression in monocytes (rho=0.395,

p=0.028). There was no significant association seen between CD4+CD28nul T-cells or CMV-specific T-cells and classical, intermediate or non-classical monocyte subsets. The size of the CCR2 expressing monocyte compartment was positively correlated with peripheral pulse pressure (rho=0.377, p=0.040) but not pulse wave velocity.

CCR2 expressing monocytes were positively correlated with ACR as a marker of proteinuria (rho=0.432, p=0.015). CCR2 expressing monocytes also positively correlated with MCP-1 in plasma, the chemokine associated with targeting monocytes to inflammatory sites (rho=0.457, p=0.010). MCP-1 in turn was positively correlated with serum creatinine (rho=0.523, p=0.003) and proteinuria (rho=0.443, p=0.013) and negatively correlated with eGFR (rho = -0.458, p=0.010).

Discussion

Our results suggest that subclinical reactivation in AAV may be associated with expansion of CCR2 expressing monocytes. We observed that expansions of CCR2 expressing monocytes were associated with higher levels of proteinuria.

Our data, although preliminary, suggest that subclinical reactivation of CMV may contribute to proteinuria and renal injury in AAV patients with renal involvement via the expansion of pro-inflammatory CCR2 expressing monocytes.

580

Audit of the burden of secondary care attendances in patients on maintenance haemodialysis with diabetes mellitus.

Dr Sarah Langlands[1]
[1]*NHS Grampian, Aberdeen, United Kingdom*

Title
Audit of the burden of secondary care attendances in patients on maintenance haemodialysis with diabetes mellitus.

Introduction
Patients with diabetes mellitus are at high risk of cardiovascular complications with associated high morbidity and mortality rates1. Despite this, attendance at regular haemodialysis makes further hospital attendances logistically difficult to organise and inconvenient for patients and therefore, organisation of screening and follow up of these complications is often challenging1.

Aim
This audit aimed to quantify the burden of hospital admissions and outpatient appointments attended by patients on maintenance haemodialysis with a diagnosis of diabetes mellitus.

Methods
Electronic records of all patients in NHS Grampian undergoing maintenance haemodialysis with a diagnosis of diabetes mellitus were reviewed retrospectively between 1st Aug 2018 – 31st July 2019. Data on the number of hospital admissions, days spent as an inpatient and number of outpatient appointments attended by each patient was collected and analysed.

Results
A total of 63 patients were identified. Of these patients, the majority dialysed regularly in Aberdeen Royal Infirmary (52.4%), with the remaining dialysing in other satellite units within NHS Grampian. During the 12 month audit period the number of hospital admissions per patient ranged from 0 to 12 with a median of 3 admissions. Number of days spent as an inpatient ranged from 0 to 165 with a median of 6 days and the number of outpatient appointments attended ranged from 3 to 110 with a median of 17 appointments.

Discussion
Patients on maintenance haemodialysis with a diagnosis of diabetes mellitus in NHS Grampian have a substantial burden of secondary care attendances. This study highlights the significant amount of time these patients spend in hospital, either as inpatients and/or for outpatient appointments. There are well established national screening programmes already in place for cardiovascular complications, including foot and retinopathy screening, however high burden of secondary care attendances in addition to time spent on dialysis undoubtedly makes follow up challenging and inconvenient for patients. It is therefore essential that organisation of the care of these patients is better managed. Suggestions for this include integrated renal/diabetes clinics and opportunistic reviews whilst patients are receiving haemodialysis.

581

Vascular access cannulation pain perception among adult undergoing maintenance haemodialysis: what is the effect of individual staff self-performance rating?

Mrs Roseline Agyekum[1], Mrs Joyce Anoquah[1], Mrs Sarala Dawadi[1], Mrs Nithyakala Devaraj[1], Ms Letittia Agbegah[1], Mrs Fatuma Rajab[1]
[1]*King's College NHS Foundation Trust, Denmark Hill, United Kingdom*

Cannulation associated pain assessment is an integral component of the pre-HD vascular access assessment as the procedure can provoke stress, discomfort and anxiety and sometime refusal to attend treatment session. The quality of the haemodialysis (HD) dose is dependent on a functional vascular access, which is a pivotal components determinant of the success or failure of the therapy. The arteriovenous fistulas (AVF), the commonest and safest access, and the arteriovenous grafts (AVG), are the predominant vascular access used in the UK. However, prior to each treatment session, AVF/AVG cannulation must be performed thrice weekly; approximately 300 punctures per year using large bore needles.
Cannulation is primarily undertaken by HD practitioners deemed competent by a senior HD nurse, the ward manager or Practice Development Nurse (PDN) following completion of competences. However, these skills set are not routinely validated. Additionally, practitioner allocation of patients, which is a routine practice among many HD units, might not always consider the dynamics of different patients' access risk versus practitioner competence.

Objective
To determine the effect of individual practitioner self-performance rating and training on cannulation pain perception among individual HD patients

Design and setting
A cross-sectional, paper-based survey of registered nurses employed at one HD satellite units.

Participants
12 HD practitioners of different clinical grades and 39 patients with a mean age of 65 of which 53.4% were males participated in this project.

Method
Practitioners rated individual patient access using the traffic light system (green, amber and red) as well as vascular access risk. Following staff self-assessment, individualised training was provided for 2 weeks by the practice development nurse (PDN) who also assessed, verified and documented achieved competency. The National Patient Reported Experience Measure section on demographics and needling pain which was amended to include the universal pain assessment tool and a section for recommendations, comments and suggestion was used as the baseline data.

Findings

54% of patient accesses were assessed by the practitioners as difficult to palpate (fig 1). However, 67% of practitioner responded able to cannulate 82% of the patient AVF/AVF. 33.3% of practitioners who were only able to cannulate 62% of the patient possessed <2 years HD experience. Using the 2017 PREM's mean needling mean score (5.3) as the baseline, the mean score for cannulation with as little pain as possible was 6.7, an improvement from being one of the lowest score to among the higher ranking HD units. Overall, 55% of the patient reported no pain during cannulation compared to 18% from April 2018. A 9 month (2019) follow-up showed a mean score of 7.8.(fig 2)
However, no statistical significant difference was found between training and reduction in cannulation pain except individual self-assessment which was statistically significant (p=0.0005).

Conclusions and implications for practice

There is an unmet need and demand among practitioners for mapping individual patient access with staff competency to identify individual practitioner learning gaps, reduce cannulation associated pain, and improve overall treatment tolerability. Self-assessment might improve staff confidence during cannulation and reduce mis-cannulation associated pain. However, adequate staffing and skill-mix needs to be considered.

582

Rhabdomyolysis induced acute kidney injury due to long chain acyl-CoA dehydrogenase (VLCAD) deficiency

Dr David Rudman[1], Dr Didem Tez[1]
[1]*James Cook University Hospital, Middlesbrough, United Kingdom*

A 40 year old female presented to Accident and Emergency with a short history of bilateral loin pain, muscle cramps, difficulty walking and reddish brown urine. This started shortly after she had been for a coastal walk. She described similar symptoms, as well as a poor exercise tolerance, intermittently over the past 20 years particularly around times of dehydration, which had been noted when she had fasted for Eid.
Her past medical history included hypothyroidism, treated with levothyroxine, and fertility issues including two first trimester miscarriages and two failed attempts at IVF. She also presented 18 years previously with an acute kidney injury and a creatine kinase of 17,000u/l though this was coded as acute renal failure of unknown aetiology. She denied taking any over the counter medications or recreational drugs. She had no family history of renal failure though her parents were second cousins.
Initial investigations showed 1+ of blood and protein on urinalysis. Her admission serum creatinine was 216umol/L and creatine kinase 22923u/l. The patient was treated with IV fluids (4 litres NaCl 0.9% and 9 litres Hartmann's in 7 days) and both creatinine and creatine kinase improved prior to discharge on day 11 (Figure 1). Creatinine continued to improve to a baseline of 68umol/L.
During admission a full renal screen was requested and she was seen by multiple specialties including renal, rheumatology and neurology; the latter of which suggested testing for serum acylcarnitines. This showed elevated C14:1 and C14:2 acylcarntines, with increased C14:1/C12:1
and C14:1/c2 ratios consistent with very long chain acyl-CoA dehydrogenase deficiency. Genetic testing showed a homozygous mutation at the ACADVL gene confirming the diagnosis.
This case illustrates a genetic predisposition to rhabdomyolysis, exacerbated by periods of fasting, in a patient with consanguine parents. The resultant homozygosity for the recessive ACADVL gene led to recurrent episodes of rhabdomyolysis and acute kidney injury, which was diagnosed at her second hospital admission with the help of multiple specialties. Treatment involved the appropriate dietary measures focused on maintaining a high carbohydrate intake and avoidance of fasting.

583

A new approach to de novo minimal change disease in pregnancy

Dr Sarah Gleeson[1], Dr Filipa Cardosa[2], Dr Kerry Munro[1], Professor Liz Lightstone[1,3], Dr Tom Cairns[1]
[1]Imperial Healthcare NHS Trust, London, United Kingdom, [2]Centro Hospitalar Lisboa Central E.P.E. , Hospital Curry Cabral, Portugal, [3]Imperial College London, London, United Kingdom

Introduction
Although proteinuria in pregnancy is common and usually due to pre-eclampsia, nephrotic range proteinuria especially early in pregnancy, warrants investigation and treatment. Decisions regarding biopsy and immunosuppressive medications are additional considerations in pregnancy. We present a case of minimal change disease (MCD) presenting in pregnancy treated exclusively with tacrolimus.

Case Report
A previously well, G1P0, 20 year old, presented at 9 weeks gestation with 3 weeks of oedema and shortness of breath.. Examination revealed marked oedema.
Investigations revealed creatinine 44 umol/L (55-110), albumin 7 g/L (35-50), urine PCR 1456mg/mmol. Autoimmune screen was negative. A fetal scan confirmed a viable pregnancy. A renal biopsy was performed which demonstrated MCD. She was started on tacrolimus in addition to enoxaparin, frusemide and aspirin. At 12 weeks she had melena. Her haemoglobin dropped from 115 to 64g/L. Her aspirin was stopped, there was no active bleeding on endoscopy and she had no further episodes in pregnancy.
She was managed by the renal and joint renal-obstetric clinic throughout pregnancy. She was maintained on tacrolimus alone. Her albumin rose and PCR fell throughout pregnancy. By 34 weeks her albumin was 28g/L and her PCR was 128 mg/mmol. Fetal growth was normal on serial growth scans. She did not develop pre-eclampsia. Labour was induced at 39 weeks and she had a normal vaginal delivery of a 3194g healthy baby.

Discussion
There have only been 4 previous reports of de novo MCD in pregnancy all of whom were treated with steroids.
In our patient who presented early in pregnancy with marked oedema and heavy proteinuria a kidney biopsy was performed.
Kidney biopsy should be performed when the benefit of obtaining a diagnosis outweighs the risks of the procedure. In pregnancy the risks of biopsy are increased (7%) compared to outside of pregnancy (1%). Biopsy during the first trimester is safest with a recent metaanalysis reporting no major complications up to 21 weeks gestation compared with a 2% risk of major bleeding between 23-26 weeks. Biopsy is generally not performed after 28 weeks.
Corticosteroids are often used to treat MCD outside pregnancy. Prednisone is safe is pregnancy. It is metabolized by placental 11-b-hydroxysteroid dehydrogenase type 2 to inactive cortisone; therefore, the fetal dose is minimal. However there is a risk of maternal complications including gestational diabetes, weight gain and hypertension.
The recent MinTac trial of prednisolone and tacrolimus in non-pregnant patients with MCD found no difference in remission rates at 8, 16 or 26 weeks and no difference in relapse rates. More patients in the prednsisolone were in complete remission at 4 weeks. We achieved partial remission in this heavily nephrotic patient with use of tacrolimus alone allowing us to avoid steroid adverse effects which was especially important after her GI bleed.
This is the first case report in which tacrolimus was exclusively used to treat MCD in pregnancy. We believe tacrolimus is a valuable option for treatment of MCD in pregnancy either as first line treatment, when steroids are contraindicated or as second line treatment.

584

The PrEscription of intraDialytic exercise to improve quAlity of Life (PEDAL) in patients with chronic kidney disease trial: A multi-centre randomised controlled trial.

Dr Sharlene Greenwood[1,2], Dr Pelagia Koufaki[3], Dr Jamie Macdonald[4], Professor Sunil Bhandari[5], Professor James Burton[6], Dr Indranil Dasgupta[7], Professor Ken Farrington[8], Professor Ian Ford[9], Professor Philip Kalra[10], Dr Mick Kumwenda[11], Professor Sandip Mitra[12], Professor Maarten Taal[13], Professor Peter Thomson[14], Dr Sharon Keane[9], Dr Claudia-Martina Messow[9], Ms Chante Reid[1], Professor Iain Macdougall[1], Professor Alice Smith[6], Professor David Wheeler[15], Mrs Claire White[1], Professor Magdi Yaqoob[16], Professor Thomas Mercer[3]
[1]King's College Hospital, London, United Kingdom, [2]King's College London, London, United Kingdom, [3]Queen Margaret University, Edinburgh, United Kingdom, [4]School of Sport, Health and Exercise Sciences, Bangor University, , Wales, United Kingdom, [5]Hull University Teaching Hospitals NHS Trust, Hull, United Kingdom, [6]University of Leicester, Leicester, United Kingdom, [7]University Hospital Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [8]Lister Hospital, Stevenage, United Kingdom, [9]Robertson Centre for Biostatistics, University of Glasgow, Glasgow, United Kingdom, [10]Salford Royal Hospital, Salford, United Kingdom, [11]Glan Clwyd Hospital, Rhyl, United Kingdom, [12]Manchester Royal Infirmary, Manchester, United Kingdom, [13]University of Nottingham, Nottingham, United Kingdom, [14]Queen Elizabeth University Hospital, Glasgow, United Kingdom, [15]University College London and George Institute for Global Health, Sydney, Australia, [16]The Royal London Hospital, London, United Kingdom

Background: Exercise interventions in haemodialysis (HD) patients have potential to improve exercise capacity, but their impact upon quality of life (QOL) remains unknown. The PEDAL study evaluated the clinical and cost effectiveness of a 6-month intradialytic exercise programme on QOL, compared to usual care for HD patients in the UK.

Methods: We conducted a prospective, multicentre randomised controlled trial (RCT) recruiting 335 HD patients and randomly (1:1) assigning them to either thrice weekly intradialytic exercise training plus usual care maintenance HD or usual care maintenance HD. The primary outcome of the study was the change in Kidney Disease Quality of Life Short Form Physical Composite Score (KDQOL-SF 1.3 PCS) between baseline and 6 months. Additional secondary outcomes included changes in peak oxygen uptake (VO2peak), habitual physical activity levels (International Physical Activity Questionnaire and Duke's Activity Status Index), fear of falling (Tinetti Falls Efficacy Scale), symptom burden assessments (EQ5D), arterial stiffness (pulse wave velocity), anthropometric measures, resting blood pressure, clinical biochemistry, safety and harms associated with the intervention, hospitalisations, and cost-effectiveness. Here we just report the primary outcome but anticipate that additional data will be available at the time of the presentation.

Results: A total of 335 patients from haemodialysis centres in 5 regions of the UK were randomised and attended a baseline assessment. At 6 months, 114 (65%) and 122 (76%) patients remained in the exercise training group and usual care group, respectively. A median of 56% of exercise training sessions were completed by patients in the exercise training group at 3 months, with 42 % sessions completed at 6 months. The KDQOL-SF1.3 PCS score increased from 33.9 (10.6) to 34.8 (11.6) in the exercise training group and reduced from 32.9 (11.3) to 31.8 (11.3) in the usual care group. Linear regression analysing the change from baseline in KDQOL-SF1.3 PCS from treatment, whilst adjusting for baseline KDQOL-SF1.3 PCS, age, sex and diabetic status, revealed a mean difference (95% CI) of 2.4 (-0.06, 4.80), p=0.056. A 1.0 increase in PCS is associated with a 3.5% improvement in the odds of death. Multiple regression analysis indicated that improvement in KDQOL-SF1.3 PCS depended on the completion of intradialytic exercise training sessions (treatment effect=0.54 (0.14, 0.94) per 10% of sessions completed, p=0.009).

Conclusions: The PEDAL intradialytic exercise programme did not statistically improve the Kidney Disease Quality of Life physical composite score sufficient to meet the primary endpoint of this study. Such improvement as occurred in this score were directly linked to the completion of the exercise training sessions. Methods to improve engagement are needed to enhance future studies and facilitate clinical implementation.