A9. Long term patient and renal outcomes in patients with Anti-neutrophil cytoplasmic antibody-associated renal vasculitis using low dose oral Cyclophosphamide as induction therapy

Dana Kidder 1, Paula Dospinescue 1, Mariana Philobos 2, Nicholas Fluck 1, Anghard Marks 3, Neil Basu 1, Lars P Erwig 1

1 Vasculitis Clinic, Aberdeen Royal Infirmary 2 Department of Rheumatology, Aberdeen Royal Infirmary 3 Section of population health, Institute of Applied Health Sciences, University of Aberdeen.

Introduction: Anti-neutrophil cytoplasmic antibody (ANCA) associated small vasculitides (AAV) are a group of chronic autoimmune conditions which are characterised by small vessel inflammation affecting different organs. Renal involvement is common and often associated with significant morbidity. AAV can be divided into three main types: granulomatosis with polyangiitis (GPA), microscopic polyangiitis (MPA) and eosinophilic granulomatosis with polyangiitis (EGPA). We conducted a retrospective analysis of all AAV patients attended our vasculitis service in the Grampian region. The aim of this analysis was to evaluate patient and renal outcomes associated with the use of low dose (1.5 mg/kg) oral Cyclophosphamide as induction therapy.

Methods: Retrospective analysis using electronic and patient case notes from 1990 to 2014. Patient's initial presentation, extent of organ involvement, renal function, urinalysis, type of ANCA, induction therapy, maintenance therapy, renal function at 3 months, 12 months and most recent available biochemical profile were examined. Patient outcomes including: survival, malignancies, infections requiring hospitalisation, cardiovascular and bone disease were also analysed.

Results:
A total of 90 patients (56 GPA, 15 MPA, 14 RLV and 5 EGPA) with histological evidence of renal involvement in AAV were identified from 157 patients with AAV. The median age at the time of presentation was 58 years (range 13-83 years). The median follow-up was 7 years (range 0.1-17 years). ANCA was positive in 98% of the patients (56 anti-PR3+ and 32 anti-MPO+). The median serum creatinine at presentation was 200 µmol/L (range 56-2250 µmol/L). Twenty two (24%) patients required haemodialysis at presentation. Oral Cyclophosphamide was used for three months as induction therapy in 90% of patients. Plasma exchange therapy was employed in 20% of patients. Relapse rate occurred at rate of 2.4 per 100 patient years. A total of 22 patients died with higher mortality associated with age, male gender and renal limited vasculitis. Death within the first year of diagnosis was accounted for less than 25% the observed mortality. Cardiovascular events and infections accounted for the cause of death in the first year. Subsequent mortality was cause by malignancies, cardiovascular disease and infections.

Conclusions:
Our long-term data show that low dose oral Cyclophosphamide in the induction therapy of AAV is well tolerated and associated with low relapse rate. Mortality was more common following the first year of therapy. Further studies are needed to assess the impact of low dose oral Cyclophosphamide on the rate of malignancies in AAV.
A10. Multiple socioeconomic deprivation is independently associated with poorer survival in patients with primary glomerulonephritis
Emily McQuarrie (1), Bruce Mackinnon (1), Samira Bell (2), Valerie McNeice (3), Stewart Fleming (2), Graham Stewart (2), Jonathan Fox (1), Colin Geddes (1) on behalf of the Scottish Renal Biopsy Registry
(1) Glasgow Renal and Transplant Unit, Queen Elizabeth University Hospital, Glasgow
(2) Renal Unit, Ninewells Hospital, Dundee
(3) Glasgow Centre for Population Health

Introduction: It is unknown whether socioeconomic deprivation impacts upon patient outcomes in primary renal diseases. We aimed to assess whether risk of death or requiring RRT in patients with primary glomerulonephritis was higher in patients living in an area of multiple socioeconomic deprivation.

Methods: Adult patients with primary glomerulonephritis (GN) from 2 Scottish renal units were included in the study: 683 who underwent native renal biopsy at the Glasgow Renal and Transplant Unit between 2000-2012, and 176 who underwent native renal biopsy at Ninewells Hospital, Dundee, between 2000 and 2014. Patients with minimal change nephropathy (n=62) were excluded. Using the Electronic Renal Patient Record, baseline demographics, postcode, follow-up blood pressure and proteinuria and time to death or RRT were recorded. The Scottish Index of Multiple Deprivation (SIMD) is a multidimensional model to assess deprivation. Using SIMD 2009, patients were separated into tertiles of deprivation. The postcode of the patient at time of biopsy was then used to determine his or her deprivation tertile. Baseline demographics were compared using one-way ANOVA, Kruskall-Wallis or Chi-square tests of significance. Survival analysis was conducted using Cox-proportional hazards model. The Scottish Renal Biopsy Registry has multi-site ethical approval for data collection and epidemiological analysis.

Results: 797 patients were included in the study cohort. 64.2% were male with mean age 54.1 (SD 17.0) years. 295 patients had a diagnosis of IgA nephropathy (IgAN) (12.6 biopsies PMP/yr), 189 focal segmental glomerulosclerosis (FSGS) (8.1 biopsies PMP/yr), 185 membranous nephropathy (MGN) (7.9 biopsies PMP/yr), and 128 had other causes of primary glomerulonephritis. Overall 174 patients required RRT and 185 died. Median follow-up was 6.3 (IQR 3.7-9.4) years. Patients in the most deprived tertile of deprivation (T1) were significantly more likely to die than those in the least deprived tertile (Exp(B) 2.2, p<0.001) and this was independent of age, baseline serum creatinine and blood pressure. They were not more likely to require RRT (p=0.22). Primary renal disease was not an independent predictor of risk of death. The increased mortality risk in the highest deprivation tertile was not uniform across primary renal diseases, with the effect most marked in FSGS and IgAN, but absent in MGN.

Conclusion: We have demonstrated a significant two-fold increased risk of death in patients with primary glomerulonephritis who live in an area of comparative multiple socio-economic deprivation at time of diagnosis. This association is independent of age, baseline renal function, blood pressure control and proteinuria. No significant effect on the risk of requiring renal replacement therapy is seen in these patients.
A11. Measuring glycaemic control in haemodialysis patients with diabetes; making the case for more specialist diabetes input
Michaela Petrie (1,2), Emily McQuarrie (1,2), Sharon Mackin (2), James Boyle (2), Russell Drummond (2), Colin Geddes (1), Gerard McKay (2)
(1) Glasgow Renal and Transplant Unit
(2) Department of Diabetes, Endocrinology and Clinical therapeutics

Background and aim
HbA1c is used as a target (range 48-58 mmol/mol or 6.5-7.5%), and measure of glycaemic control but is unreliable in haemodialysis (HD) patients. Optimal diabetes control incorporates recognition and avoidance of hypoglycaemia and hyperglycaemia. A reliable method to identify HD patients with suboptimal control in order to prioritise diabetes specialist input is desirable. The aim of this study was to examine the HbA1c and incidence of significant hyper and hypoglycaemia in current diabetic HD patients.

Methods
All patients with diabetes on HD on 22/9/14 in the Glasgow Renal and Transplant Unit were identified (7 HD units serving a population of approximately 1.5 million). Relevant demographic, clinical and laboratory data were obtained from the renal (SERPR) and diabetes (SCI-Diabetes) electronic patient records. For each patient we obtained the most recent HbA1c and the number of episodes, values and dates of random blood glucose (BG) <3, <4 >20 and >30mmol/l since the start of the current period of HD. The incidence of hypo- or hyper-glycaemia were compared with HbA1c and prescribed treatment. A sample of patients completed a questionnaire to including frequency of hyper and hypo-glycemia on home monitoring.

Results
38% of patients had an HbA1c under 48 mmol/mol, 21% on target (48-58 mmol/mol) and 41% above target (>58 mmol/mol). Patients with HbA1c above target were more likely to experience both severe hyper (37% having had a BG >30mmol/l, and 79% having BG >20mmol/l) and hypoglycaemia (42% having had a BG <4mmol/l and 23% a BG <3 mmol/l). Patients with HbA1c on and below target however also exhibited poor control with episodes of hyper and hypoglycaemia (see figure 1). No correlation was seen between frequency of hyper- or hypo-glycaemia and HbA1c or prescribed diabetes treatment.

Conclusion
HbA1c measurements in HD patients are unreliable and potentially misleading. Using HbA1C alone to assess diabetes control in patients on HD may miss dangerous swings in blood sugars, which can only be identified by direct patient consultation and review of hospital and home blood glucose readings.

Figure 1. Proportion of patients within HbA1c category experiencing hyper and hypoglycaemia since starting HD.
(The authors have no conflicts of interest to declare. No funding was provided for this study.)
A12. Impact of Urate Lowering with Xanthine Oxidase Inhibitors on Renal Function of Patients in the FAST trial

C.G. Jennings, T.M. MacDonald and I.S. Mackenzie
Medicines Monitoring Unit, University of Dundee

Background:
The Febuxostat versus Allopurinol Streamlined Trial (FAST) is recruiting patients in the UK and Denmark who are aged over 60, treated for symptomatic hyperuricaemia and have an additional cardiovascular risk factor. Patients are randomised to either allopurinol or febuxostat and followed up for at least 3 years. There is evidence that reducing serum urate using xanthine oxidase inhibitors may have beneficial effects beyond the treatment of gout and FAST patients provide an opportunity to study the impact of long term use of both allopurinol and febuxostat on renal function.

Methods:
Data for screening and annual serum urate (sUA) and creatinine clearance (CrCl) was collected from all consecutively randomised FAST patients between 01/01/12 and 31/05/13 (n=657 patients with complete follow up data). Patients were grouped according to how sUA changed from screening to annual follow up.

Results:
Change in sUA over one year was a significant predictor of change in CrCl (p<0.001). In groups 1 and 2 (sUA increased or unchanged at annual follow up) CrCl decreased by mean 6.5ml/min. In groups 3, 4 and 5 (sUA decreased by at least 10% at annual follow up) CrCl decreased by mean 3.6ml/min. Therefore CrCl decreased by 2.9 ml/min [95% CI 4.8 - 0.9] less over 1 year in those whose sUA fell by at least 10%.

Conclusion:
Reduction of sUA using xanthine oxidase inhibitors had a small but significant positive effect in reducing renal function decline in this select population. There may be a role for xanthine oxidase inhibitors in slowing progression of CKD and further research is required.

FAST is funded by Menarini and sponsored by the University of Dundee.
A13. Kidney disease and the risk of stroke: a cohort study of 10,745 people with end-stage kidney disease

Philip MASSON¹,², Patrick J Kelly¹, Jonathan C Craig¹,², Richard I Lindley³, Angela C Webster¹,²
¹Sydney School of Public Health, University of Sydney, NSW 2006, Australia
²Department of Renal Medicine, Royal Infirmary of Edinburgh, United Kingdom
³The George Institute for Global Health, University of Sydney, Sydney, NSW 2050, Australia

Background and objectives: Stroke risk in people with end-stage kidney disease (ESKD) is unclear. We aimed to determine absolute and excess stroke risks in people with ESKD compared to the general population.

Design, setting, participants and measurements: Retrospective cohort study using data linkage between the Australia and New Zealand Dialysis and Transplant Registry, and hospital and death records for 10,745 people with ESKD in New South Wales, 2000-2010. For the general population we used Australian Institute of Health and Welfare hospital usage records and Australian Bureau of Statistics census data. We calculated rates and standardized incidence rate ratios (IRR) of hospitalization with a stroke.

Results: People with ESKD had 640 hospitalizations with a stroke in 49,472 person-years of follow-up (1293.7 per 100,000 person-years) and people in the general population had 338,392 hospitalizations with a stroke (211.6 per 100,000 person years), an IRR of 3.32 (95% confidence intervals, 95%CI, 3.31 to 3.33). Excess risk was greater for women (IRR 5.14, 95%CI 5.11 to 5.18) than men (IRR 2.52, 95%CI 2.51 to 2.54) and decreased with age. People aged 35-39 years with ESKD had an eleven times increased risk of stroke (IRR 11.08, 95%CI 9.41 to 13.05) with risk in people aged ≥85 years increased two-fold (IRR 2.04, 95%CI 1.87 to 2.23). Excess risk was greater for intracerebral hemorrhage (IRR 4.18, 95%CI 4.11 to 4.26) than ischemic stroke (IRR 3.43, 95%CI 3.40 to 3.45).

Conclusions: People with ESKD have a substantially increased risk of stroke, particularly women and young people, and for hemorrhagic stroke. Investigation of effective and safe interventions for primary and secondary prevention of stroke in people with ESKD is needed.
A14. Prognosis following ischaemic stroke in people with chronic kidney disease: a cohort study of 650 people

Philip MASSON1, 2, Patrick J Kelly1, Jane Maguire3, Jonathan C Craig1, 2, Richard I Lindley4, Angela C Webster1, 2
1 Department of Renal Medicine, Royal Infirmary of Edinburgh, United Kingdom
2 Sydney School of Public Health, University of Sydney, Sydney, NSW 2006, Australia
3 School of Nursing and Midwifery, University of Newcastle, Ourimbah, NSW 2380, Australia
4 The George Institute for Global Health, University of Sydney, Sydney, NSW 2050, Australia

Background and purpose: Chronic kidney disease (CKD) is associated with an increased risk of stroke but the prognosis following stroke in people with CKD is relatively uncertain. We aimed to determine how CKD affects outcomes after an ischaemic stroke.

Methods: We performed a prospective cohort study of people admitted with an ischaemic stroke to any of four acute stroke units located in principal referral hospitals in the Central Coast and Hunter regions of New South Wales, Australia between August 2003 and August 2008 followed for 90 days. We estimated the risk of dying after a stroke using Cox proportional hazards models, and examined whether CKD was associated with complications, discharge destination and severity of disability using logistic regression. We hypothesized that poorer outcomes may be in part due to the underutilization of standard pharmacological interventions including antiplatelet agents, angiotensin II converting enzyme inhibitors and statins. Results were expressed as hazards or odds ratios (HR, OR) along with their 95% confidence intervals (CI).

Results: Of 650 people who were eligible for inclusion, 39 died in 185.7 patient-years of follow-up. The risk of dying after a stroke increased by 26% (HR 1.26, CI 1.05 to 1.52) for every 10ml/min/1.73m² decrement in estimated glomerular filtration rate (eGFR). Disability was also more severe with poorer kidney function. The risk of being moderately to severely disabled compared to making a good recovery following a stroke increased by between 18% (OR 1.18, CI 1.05 to 1.34, Glasgow outcome scale) and 39% (OR 1.39, CI 1.02 to 1.90, modified Rankin Scale) with every 10ml/min/1.73m² decrement in eGFR. On discharge from hospital, people with CKD were 28% less likely to be prescribed an antiplatelet agent (OR 0.72, CI 0.51 to 1.00) and 28% less likely to be prescribed a statin (OR 0.72, CI 0.52 to 0.99) than people without CKD.

Conclusions: CKD is a major risk factor for poor outcomes following an ischaemic stroke, including death. In part this may be due to the underuse of effective therapies.
A15. Avoidance of a flucloxacillin/gentamicin based antibiotic prophylaxis policy reduces post-operative Acute Kidney Injury in patients undergoing orthopaedic surgery

Heather Walker¹, Andrea Patton², Gwen Bayne³, Charis Marwick², Jacqueline Sneddon³, Peter Davey², Dilip Nathwani³, Samira Bell¹

¹Renal Unit, Ninewells Hospital, Dundee
²Population Health Sciences Division, Medical Research Institute, University of Dundee, Dundee
³Scottish Antimicrobial Prescribing Group, Scottish Medicines Consortium, Glasgow

Background: Prophylactic antibiotics are used in orthopaedic implant surgeries to reduce the rates of surgical site infections. National antibiotic policy changes within NHS Scotland in 2008 aimed to reduce Clostridium difficile infection (CDI) rates. Subsequent evidence emerged that the new prophylactic antibiotic regimen of flucloxacillin and gentamicin for orthopaedic surgery was associated with a significantly increased rate of post-operative acute kidney injury (AKI). This resulted in a further change to the national antibiotic policy recommendation for orthopaedic surgical prophylaxis in Scotland. In 2012 in NHS Tayside, the policy was changed from flucloxacillin and gentamicin to co-amoxiclav. Fracture neck of femur (NOF) repair patients received co-amoxiclav from the policy changes in 2008 onwards.

Methods: An observational cohort study was performed to assess the rates of AKI and CDI among patients who had undergone orthopaedic surgeries. Interrupted time series (ITS) analyses were used to assess rates of post-operative AKI in patients undergoing NOF repair and other orthopaedic operations, over the time period of October 2008 to December 2013. Incidence rate ratios (IRR) were used to evaluate changes in CDI rates. Length of hospital stay and one year post-operative mortality were also examined.

Results: Following the change in policy there was a relative change in rates of all post-operative AKI of -63% (95% CI -77% to -49%) at 18 months. In the NOF repair group, there was no change in the rate of post-operative AKI -10%, (95% CI -35% to 15%) at 18 months. The IRR for CDI was 0.29 (95%CI 0.09 to 0.96) and 0.76 (95%CI 0.28 to 2.08) for fracture NOF repair. A higher proportion of patients with post-operative AKI died within 1 year of surgery compared with patients without post-operative AKI in both groups, 10.48% versus 5.18%, respectively in the other orthopaedic surgeries group and 36.63% versus 25.15%, respectively in the NOF repair patients. There was no difference in length of hospital stay in patients with post-operative AKI compared with patients without post-operative AKI, in either group.

Conclusion: The use of co-amoxiclav for antibiotic prophylaxis in orthopaedic surgery was associated with a decreased rate of post-operative AKI compared to flucloxacillin and gentamicin and was not associated with increased rates of CDI.

Funding: No funding was sought for this study.

Conflicts of interest: None
INTRODUCTION AND AIMS: Premature (usually sudden) cardiovascular death is the commonest cause of death in end stage renal disease (ESRD) patients. We have measured high energy phosphate (HEP) levels using phosphorus-31 magnetic resonance spectroscopy and shown phosphocreatinine: β ATP (PCr: β ATP) ratios are significantly reduced in patients with ESRD. In haemodialysis patients, reducing dialysate temperature by 1-2°C has been associated with reduced frequency of intradialytic hypotension and improvement in left ventricular function. However, the cardiac metabolic effects of reduced temperature dialysis have not been evaluated. We compared myocardial function and PCr: βATP ratios levels in haemodialysis patients before and after consecutive three normothermic (36.5°C) and reduced temperature (35°C) dialysis sessions.

METHODS: Twelve haemodialysis patients underwent cardiac MRI and phosphorus magnetic resonance spectroscopy of their left ventricle (LV) within 30 minutes before and after three normothermic and three reduced temperature maintenance dialysis sessions. Left ventricular dimensions were measured by an observer blinded to intervention. PCr: β ATP were calculated from $^{31}$P-MR spectra (figure 1) and β- ATP was corrected for blood contamination.

RESULTS: No patients developed intradialytic hypotension. Reduced temperature haemodialysis sessions was significantly associated with an increase in predialysis LV ejection fraction (36.5°C- 64.5%±6.6 vs. 35.0°C- 69.0%±6.1;p=0.03). At both temperatures, haemodialysis was associated with an increase in mean LV ejection fraction (36.5°C- predialysis 64.5%±6.6, postdialysis 70.9%±6.8, p=0.002; 35.0°C- predialysis 69.0%±6.1, postdialysis 74.2%±8.3, p=0.001). PCr: β ATP was significantly higher after normothermic (predialysis 0.85±0.2 vs, postdialysis 1.26±0.3; p<0.01) and reduced temperature haemodialysis (predialysis 1.06±0.4 vs, postdialysis 1.59±0.8; p=0.03; figure 2). Furthermore the mean relative increases in PCr: β ATP was higher after reduced temperature compared to normothermic haemodialysis (+51.5% vs. +74.1% respectively).

CONCLUSIONS: Haemodialysis is associated with improved myocardial metabolic activity and this effect may be amplified by reducing the dialysate temperature even in patients with no intradialytic hypotension.

FUNDING: Academy of Medical Sciences Clinical Lecturer Starter Grant

CONFLICTS OF INTEREST: None

Paul Hunter\textsuperscript{1}, Samantha Hayward\textsuperscript{2}, Christine Jansen\textsuperscript{2}, Jamie Traynor\textsuperscript{3}, Nynke Halbesma\textsuperscript{1}, Jeremy Walker\textsuperscript{1}, Sarah Wild\textsuperscript{1}, Wendy Metcalfe\textsuperscript{2,3}, Gabriel Oniscu\textsuperscript{2}.

\textsuperscript{1}University of Edinburgh on behalf of the Scottish Diabetes Research Network Epidemiology Group; \textsuperscript{2}RIE Transplant Unit; \textsuperscript{3}Scottish Renal Registry.

**Objectives:** To compare 3 year survival in patients with type 1 diabetes mellitus (T1DM) and end-stage renal failure (ESRF) following assessment for simultaneous pancreas-kidney (SPK) transplantation by listed for transplant status.

**Design:** Retrospective cohort study

**Setting:** Scotland

**Participants:** 160 patients with T1DM and ESRF (two eGFRs ≤ 20ml/min/1.73m\textsuperscript{2} (MDRD) recorded more than three months apart or receiving dialysis), aged 16 to 65 years, who were assessed for SPK transplantation between 1\textsuperscript{st} January 2004 and 31\textsuperscript{st} December 2011. Follow-up data were collected to 31\textsuperscript{st} December 2014.

**Main outcome:** Kaplan-Meier survival curves for the ‘SPK Listed’, ‘KAT Listed’ and ‘Not Listed’ groups were obtained and were compared using the log-rank test in order to determine survival between groups over time. Crude and adjusted odds ratios (OR) for 3 year mortality following assessment were obtained using a logistic regression model. These ORs provide an estimation of the odds of death in the ‘SPK Listed’ and ‘KAT Listed’ groups using the ‘Not Listed’ group as a reference.

Adjustments were made for the following pre-defined confounding factors: age, sex, social deprivation, smoking, mean BMI, mean HbA1c and pre-assessment vascular comorbidity.

**Results:** Demographics were similar between the three listed groups. Patient survival at 1 year, 3 years and 5 years from assessment is presented in the following table:

<table>
<thead>
<tr>
<th>Patient Survival (%) from Assessment</th>
<th>Listed Group</th>
<th>1 year (%)</th>
<th>3 year (%)</th>
<th>5 year (%)</th>
<th>Log Rank p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPK</td>
<td>99.0</td>
<td>90.7</td>
<td>88.4</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>KAT</td>
<td>97.2</td>
<td>86.1</td>
<td>71.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>74.1</td>
<td>25.9</td>
<td>3.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After adjusting for all key baseline covariates the odds of death at 3 years following assessment was similar in the ‘SPK Listed’ and ‘KAT Listed’ groups compared to the ‘Not Listed’ group, OR\textsubscript{adj} = 0.04 (0.01 to 0.14) and OR\textsubscript{adj} = 0.04 (0.01 to 0.20) respectively.

**Conclusions:** After assessment for SPK, patients listed for SPK (OR\textsubscript{adj} = 0.04 (0.01 to 0.14)) or KAT (OR\textsubscript{adj} = 0.04 (0.01 to 0.20)) have a better 3 year survival compared to patients not listed for SPK or KAT. Further research is required in order to model survival from date of transplant.
A18. Procalcitonin in Patients on Renal Replacement Therapy

A. E. Sinclair¹, M. Doyle², M. E. Lafferty³ and J. Joss²
¹4MB University of Dundee Medical School
²Department of Intensive Care Medicine, Ninewells Hospital and Medical School, Dundee, DD1 9SY
³Department of Renal Medicine, Ninewells Hospital and Medical School, Dundee, DD1 9SY
Corresponding author: a.e.sinclair@dundee.ac.uk

Background
Procalcitonin (PCT) is a biomarker of infection. It is currently used in Ninewells ICU and surgical HDU alongside C-reactive protein (CRP) and white cell count (WCC) to assist in the differentiation between infective and non-infective inflammatory processes, to monitor therapeutic response to antibacterial therapy and to reduce antimicrobial use. We anticipate that other patient populations may benefit from the use of PCT. Patients with end stage renal disease (ESRD) on dialysis are known to have chronic low levels of inflammation and in this group it can be difficult to determine inflammation from infection. We believe that PCT may improve the treatment for this patient population. Prior to the introduction of PCT into clinical practice within this group it is essential to establish baseline levels of PCT.

The aim of this project is to determine the baseline PCT in patients on renal replacement therapy (RRT).

Methods
In March 2015, 196 patients were undergoing chronic dialysis in Tayside. We measured PCT level on a residual serum sample from the patient’s routine monthly pre-dialysis bloods following R&D approval. PCT results were analysed to determine a baseline PCT value for patients on RRT.

Results
During March 2015, there were 196 patients receiving RRT in Tayside. 55% were male and the median age was 67 years (IQR 55-77 years). 88% of patients were undergoing haemodialysis (HD) and 12% peritoneal dialysis (PD). Of the 196 patients, 37 did not have their PCT measured on the residual blood sample during the project. Of the remaining 159 patients (154 HD and 5 PD), the median PCT was 0.32 (IQR 0.24-0.49). The distribution of PCT values is shown in Figure 1. Of the 7 outlying results, consisting of patients with a PCT > 1, 3 of these were on antibiotics for a known infection.

Discussion
Previous research has shown similar results on a smaller cohort of patients (1). This project has further demonstrated normal PCT values in patients on RRT. Knowledge of the baseline PCT value in this patient population could assist clinicians in differentiating infection from inflammation to improve patient care and antibiotic stewardship.
**Funding for work:** Tayside Renal, Anaesthesia & Critical Care Clinical Governance Committee.

**References**

Samantha Hayward¹, Paul Hunter², Christine Jansen¹, Gabriel Oniscu¹, Jamie Traynor³, Sarah Wild², Wendy Metcalfe¹,³
¹ RIE transplant Unit; ² University of Edinburgh on behalf of the Scottish Diabetes Research Network epidemiology group; ³ Scottish Renal Registry

AIM. The transplant unit of the Royal Infirmary of Edinburgh (RIE) has been commissioned by NHS National Services Scotland to provide simultaneous kidney and pancreas transplantation (SPK) for all of Scotland since 2002. We sought to describe the prevalence and geographic distribution of patients who might potentially benefit from SPK and to determine if access to assessment for SPK is equitable nationally.

METHODS. All patients referred to RIE for SPK assessment between 01 January 2004 and 31 December 2011 were identified from RIE transplant unit records and were installed onto the Scottish Renal Registry (SRR). From the Scottish Care information-Diabetes Collaboration (SCI-DC) database all patients in Scotland with type 1 diabetes, aged 16-60 at any point during the study period and with eGFR <20 ml/min/1.73m² on two occasions three months apart or receiving renal replacement therapy were identified. The SRR and SCI-DC databases were linked with permission from the Privacy Advisory Committee and Caldicott guardians. Follow-up data until 31 December 2014 were obtained from the SRR. 15 patients were excluded because they were referred for assessment for pancreas transplant alone or pancreas after kidney transplant. Population statistics were obtained from the General Register Office for Scotland. Patient age was defined as age on 01 January 2007 (the study mid-point). Area-based socio-economic status (SES) and health board area of residence were derived from patients' postcode. Logistic regression was used to compare odds of being listed for SPK for age, sex, SES, Health Board (with comparison to Lothian).

RESULTS. Between 01 January 2004 and 31 December 2011, 616 patients across Scotland were identified as potentially eligible for SPK transplant using our selection criteria. This equated to 19.7 eligible individuals (95% CI 18.2 – 21.3) per 100 000 age specific total population. Of those who were eligible, 219 (35.6%) patients had been assessed for an SPK transplant by 31 December 2014. Following assessment, 133 patients had been listed for SPK transplant with 111 receiving an SPK transplant by the end of follow up.

Patients who were ≤ 40 years were more likely to be assessed for an SPK transplant than patients who were older, (p<0.0001). There was no significant difference in sex, SES, referring Health Board nor distance from the transplant unit for those who were assessed or not either before or after age adjustment. People who were assessed had lower prevalence of cardiovascular disease than those who were not.

Univariate analysis of patients referred for SPK assessment suggested that those aged ≤ 40 years were more likely to be listed than patients aged 41-50 and ≥ 51 years (OR 0.34, 0.13-0.84, and OR 0.43, 0.17-1.10 respectively). There was no significant difference in odds of listing by sex or SES. Patients who were assessed
pre-emptively (prior to starting renal replacement therapy) were more likely to be listed than those who were not (OR 0.44, 95% CI 0.25-0.80). Following adjustment for age and pre-emptive assessment there was no association between Health Board and listing for SPK.

**CONCLUSION.** Across Scotland there is equity of access to assessment and listing for SPK by Health Board.
A20. Pilot feasibility study of whole body vibration exercise (WBVE) in chronic Haemodialysis

A Doyle, NHS Fife

Introduction
Patients with end-stage renal disease (ESRD) suffer a decline in physical capacity. Despite good evidence that physical exercise is beneficial, achieving regular physical exercise often fails. Vibration exercise is a novel protocol designed to prevent the loss of muscle mass and bone mineralization during prolonged periods of immobility demonstrated in frail elderly patients. Short sessions of Whole Body Vibration Exercise (WBVE) may make exercise easy to integrate into the dialysis schedule with minimal time and staff input. We undertook a pilot study to gauge the feasibility of a larger randomised multicentre trial.

Methods
Patients undergoing regular haemodialysis across NHS Fife were assessed for recruitment. Eligible patients undertook the intervention, un-controlled, unrandomised. Exercise involved vertical 3 minutes vibration at 50 Hz and 10mm displacement three times per week prior to haemodialysis. The intervention was supervised by trained nursing staff.

We assessed multiple measures of patients' physical condition (including functionality, muscle strength, indirect exercise capacity, nutritional status and bone health) and quality of life before and after an eight week intervention period of exercise. Baseline recordings were repeated following the intervention period. We then repeated the assessments four weeks after ending the intervention to determine any residual effects of WBVE.

Results
74 patients asked to participate, of whom 49 were eligible. 25 patients completed all exercise and assessments. Age varied from 24 – 92 years, mean 65, median 70 years. Those who withdrew were, on average, older by 8.4 (95% confidence interval 0.01 to 16.9) years, P=0.049. Sit to stand test increased with exercise baseline 20.2 increased by 1.6 p=0.038 and there was a trend to increased fat free mass. -0.5Kg p =0.099. No changes were recorded for Tinetti, weight, arm/calf circumference, hand grip strength estVO2max.

After 4 weeks without vibration exercise, Sit to stand decreased without significance ,but an increase in hand grip strength was seen. 50.7N increased to 54.3N

Quality of life indices are still to be analyzed. Patient experience was very positive and clearly stimulated interest in exercise.

Conclusion
WBVE was easily incorporated into the routine management of haemodialysis patients. It may improve core body functional strength. A further randomised study should proceed.
A21. The impact of coronary angiography on renal transplant function
Jennifer Lees¹, Mark Findlay¹, Jonathan Clouston², Colin Geddes¹

1 - Department of Renal Medicine, Queen Elizabeth University Hospital, Glasgow.
2 - University of Glasgow Medical School, Glasgow.

Background: Patients with renal transplants are at higher than normal risk of coronary artery disease. There may be reluctance in performing coronary angiography in patients with a renal transplant because of the perceived risk of contrast nephropathy. We sought to determine if renal transplant function was adversely affected within 30 days of coronary angiography.

Methods: We conducted a retrospective study of all prevalent renal transplant patients in the west of Scotland (NHS Greater Glasgow and Clyde, NHS Lanarkshire and NHS Ayrshire and Arran) undergoing coronary angiography between 04/07/2010 – 05/02/2015. Data were extracted from the west of Scotland electronic patient record (SERPR) then collated and checked by two operators: sex, age at angiography, time since renal transplant, indication and purpose of coronary angiography. Baseline serum creatinine (SCr) was calculated for all patients as the median value of SCr in 6 months prior to coronary angiography, excluding SCr values during periods of acute kidney injury (AKI). Where available, SCr was recorded at time of angiography (0-24 hrs pre-angiography), within 7 days post angiography (peak value) and at 7-30 days post angiography. Rise in SCr ≥26umol/l from baseline was considered significant. Mean values are quoted ± standard deviation. Data were analysed using Microsoft Excel (2010).

Results: There were 72 coronary angiograms conducted in 52 patients, of whom 34.6% were female. The mean age was 56.0 ± 9.0 years. Mean time since transplant was 8.9 ± 8.0 years. Angina was the indication for angiography in 33.3% cases and non-ST elevation myocardial infarction in 29.2%. Median baseline SCr was 136umol/L (IQR 114-214). Median SCr at angiography was 141 umol/l (IQR 115-194). Within 7 days following angiography, there was a significant rise in SCr in 23.1% cases (n=39; median 45umol/l, range 28-138umol/l). In 8.5% instances, there was a persistent rise in SCr in days 7-30 post angiography (n=71; median rise 54, range 34-404). The two patients with the highest rise in SCr were palliated or died following angiography. Within 30 days, SCr had returned to within 30% of baseline renal function in 95.8% cases. No patients required extended admission or dialysis for acute kidney injury.

Conclusion: In a geographically high risk cohort of renal transplant recipients, coronary angiography was associated with a significant rise in creatinine in a minority of cases. In the absence of critical illness, there was no requirement for extended admission or renal replacement therapy.