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Is Methoxy polyethylene glycol-epoetin beta better than shorter acting ESAs in treating anaemia of chronic kidney disease in patients on haemodialysis.

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Anaemia is a major problem in patients with chronic kidney disease. More than 90% of patients with an eGFR of less than 25 ml/min suffer from anaemia of chronic kidney disease. The innovation of erythropoiesis-stimulating agents has changed the way of treating anaemia in this group of patients by decreasing the dependence on blood transfusion and its associated risks. The three most commonly used erythropoiesis-stimulating agents are epoetin, darbepoetin alpha and Methoxy polyethylene glycol-epoetin beta. This research aims to investigate the efficacy of Methoxy polyethylene glycol-epoetin beta and whether it is better than shorter acting erythropoiesis-stimulating agents (epoetin and darbepoetin). Critical analyses of relevant studies in the literature were performed to answer the research question. The main results of the analyses showed that there is strong evidence that Methoxy polyethylene glycol-epoetin beta is effective in achieving and maintaining stable haemoglobin levels in patients on haemodialysis. The safety profile of Methoxy polyethylene glycol-epoetin beta is essentially equal to the other erythropoiesis-stimulating agents. Despite evidence of similar efficacy to the other agents, there are two factors that may make the use of methoxy polyethylene glycol-epoetin more favourable. Firstly, there is good evidence that it requires fewer dose adjustments to stabilise the haemoglobin levels. Secondly, health professionals require significantly less time to prepare and deliver it. This will result in saving potentially significant time, effort and cost in comparison to other erythropoiesis-stimulating agents. In conclusion, Methoxy polyethylene glycol-epoetin beta can be recommended as first-line treatment for patients with anaemia of chronic kidney disease who are already on haemodialysis.

Improved patient care and efficiency savings following the introduction of a virtual integrated multidisciplinary diabetic renal meeting

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Diabetic nephropathy is a leading cause of end-stage renal failure. Management objective is to exclude other causes, prevent decline of renal function, manage cardiovascular risk and complications of both diabetes mellitus (DM) and chronic kidney disease (CKD).

We performed a 3-year audit of 88 patients (59 male, age 68 +/- 14years) who attended the diabetes-renal MDT service at District General Hospital. Results are presented as medians and ranges according to data distribution.

Median HbA_{1c} and Hb were similar throughout the study (HbA_{1c} 63 (39-131)mmol/mol, vs 61 (40-109)mmol/mol; Hb 117 (81-153)g/dL vs 115 (82-161)g/dL; NS). Cholesterol improved with MDT attendance (4.0 (2.4-6.7)mmol/mol vs 3.6 (2.1-5.7)mmol/mol; p=0.005). We reduced use of sulphonylureas (20/88 patients before vs 10/88 after MDT; p=0.019). Renal bone disease screening improved with MDT (60/88 vs 77/88 patients; p=0.001).

Follow-up was organised in the appropriate clinic (renal only if biopsy, immunosuppression, dialysis or transplant were needed). 51/88 patients were allocated to both, 23/88 to diabetes clinic only and 7/88 to renal clinic only. Remaining patients were discharged to the GP/community/other trust with clear follow up instructions. The number of specialist outpatient appointments was reduced (300/year before vs 262 in the consecutive year). At a cost of approximately £200 per clinic, total savings of £7600 were made (£86 per patient/year).

An integrated approach enhances clinical care and minimises outpatient visits. We have created a simple and comprehensive pathway for screening and management of patients with diabetes and CKD.

Characteristics of patients with diabetes admitted with AKI (Acute Kidney Injury) in a District General Hospital

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Introduction

We have dedicated AKI and diabetes outreach teams consisting of specialist nurses, consultants and a pharmacist. We reviewed mainly stage 1 and 2 AKI patients seen over two months (n=163). Stage 3 AKI patients are generally reviewed by nephrologists. 51(31%) had diabetes (DM) (100% Type 2).

Results

The mean age of the diabetic patients was 75.5 years; 78 years without DM (NDM). Mean HbA1c was 56mmol/mol. 61% had hypertension.61% DM patients had Chronic Kidney Disease (CKD) 3/4 preadmission vs. 49% of NDM. 84% were under primary care only, 14 % under secondary care. 29% of patients had never had urine Albumin Creatinine Ratio measured, 45% did not have urinalysis done prior to being seen by the AKI team. DM patients were less likely to have hypovolaemia contributing to their AKI than NDM patients 55% vs 72% (p=0.03). There was no difference between the groups with regards to sepsis or infection as a contributor.

Conclusion

A large proportion of patients with DM and CKD 3/4 are under primary care only. We identified an unmet educational need regarding screening and monitoring for diabetic nephropathy in primary care. Sick day guidance cards have been adopted to reduce AKI in this patient cohort. There is a failure to meet NICE AKI guidance regarding urinalysis on

admission in this high risk population. Hypovolaemia was more likely to contribute to AKI in NDM than DM. It is not known why this is the case and merits further investigation.

Medicines management in patients with diabetes admitted with AKI (Acute Kidney Injury) in a District General Hospital

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Introduction
We have dedicated AKI and diabetes outreach teams consisting of specialist nurses, consultants and a pharmacist. We reviewed the medicines management of patients with mainly stage 1 /2 AKI seen over two months (n=163). Stage 3 AKI are reviewed by nephrologists. 51(31%) had diabetes (DM) (100% Type 2).

Results
41% of DM patients were on metformin, 57% had metformin withheld on admission. 25% of those withheld were restarted on discharge after resolution of AKI. 52% of those admitted on metformin had Chronic Kidney Disease (CKD) 3 / 4. 53% were on RAS (Renin Angiotensin System) blockade: of which 37% had retinopathy, 60% microalbuminuria. Of those not on RAS blockade: 42% had retinopathy, 58% microalbuminuria. 66% on RAS blockade had it withheld on admission. 22% were restarted- all at baseline renal function. Of those not restarted –the indication was hypertension (80%) where restarting should be individualised.

Conclusions
A significant proportion of patients with microvascular disease are not on RAS blockade or metformin. The majority of patients on metformin had it withheld on admission but only a small proportion had it restarted on discharge. Metformin could have been restarted based on documented renal function. 33% admitted on RAS blockade were continued on it despite AKI and should have been stopped. Where RAS blockade was restarted this was done appropriately, with renal function returning to baseline. The complex decision to restart medication in these high risk patients often defaults to primary care where specialist knowledge required to make appropriate decisions may be lacking.

Monitoring and management of cardiovascular risk factors in patients with advanced diabetic nephropathy

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Background and Aims
Diabetic nephropathy is one of the most important complications of diabetes and these patients have very high cardiovascular risk. The audit was to look into the whether these patients are being monitored and managed appropriately particularly the cardiovascular risk factors.

Methods
Retrospective Data was collected from the previous OP clinic attendences of the patients being followed up in advanced diabetic nephropathy clinic. Total patients included were 60.

Results
Mean age was 70 years and 63% were male. 93% had type 2 DM. 12% were on dialysis at present.90% of patients had their eGFR checked in last 12 months. 20% of patients did not have their CKD stage documented in last visit. 93% and 98% had urine ACR and serum creatinine checked in last 12 months respectively. 53% patients had their BP with in target on last visit(<130/80). 81% were currently using ACEI/ARB. 98% had HbA_{1c} checked in last 12 months and 65% had HbA_{1c} with in target (<58 mmol). 85% patients were on a statin at present and 57% had cholesterol with in target (Total Cholesterol<4).

Conclusion
The audit results showed that the monitoring of patients was upto standards apart from documenting the CKD stage, but it was difficult to achieve an optimal diabetic control and to keep the blood pressure within target.

The clinical significance of blood ketone measurement in hyperglycaemic in-patients with insulin treated diabetes mellitus and end stage renal failure

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Diabetic ketoacidosis (DKA) is a serious metabolic condition, with ketosis, hyperglycaemia and acidosis. UK management guidelines include intravenous fluid replacement, urine and blood ketone monitoring. Patients with renal failure need amended guidelines. For example, they may be oliguric, so neither require or tolerate the liberal rehydration regimes recommended in DKA or in sick day rules. Acidosis is assessed in Renal Units by routine serum bicarbonate measurement. To assess the utility of blood ketone measurement, we measured prospectively the serum betahydroxybutyrate in patients with renal failure and insulin-treated diabetes mellitus admitted as an emergency to our Renal Unit between July-September, 2016.

There were 26 admissions in 23 patients. 12 were confirmed to have Type 1 diabetes (T1DM). The median (range) age of the T1DM was 38 (33-55) years, and 7 were women. All had chronic kidney disease stage 5; 11 were on renal replacement therapy and the other had estimated Glomerular Filtration Rate 10ml/min. Median (range) blood glucose was 21.4 (5.8-78.4) mmol/l and bicarbonate 19 (9-26) mmol/l. 3 patients had betahydroxybutyrate >3mmol/l, of whom 2 had bicarbonate <15mmol/l and had omitted insulin doses (glucoses 32.0 and 78.4mmol/l). The third was not acidotic, had glucose 23.4mmol/l, and had vomiting attributed to alcoholic gastritis, not DKA. No patient with Type 2 diabetes had significant ketonaemia despite blood glucose up to 45.7mmol/l.

This study does not support routine blood ketone measurement in diabetic patients with renal failure admitted to Renal Units.

Audit of haemodialysis inpatient with co-morbid diabetes

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Background

Diabetes is the leading cause of end stage renal disease (ESRD) worldwide. In the UK approximately one third of patients with diabetes will develop ESRD, with a significant proportion of these patients requiring Renal Replacement Therapy.[3]

Hypoglycaemia is common in diabetes patient who receive maintenance haemodialysis. This is thought to be due to; impaired renal gluconeogenesis, malnutrition, and the increased half-life of antihyperglycaemic agents.[1] Optimising glycaemic control in patients with diabetes undergoing maintenance haemodialysis requires accurate assessment of glycaemic status, appropriate alteration of prescribed antihyperglycaemic medication doses for dialysis and non-dialysis days to minimise the risk of hypoglycaemia.

The Joint British Diabetes Societies[2] has recently published guidelines on the management of adults with diabetes on the haemodialysis unit. This includes guidance on the adjustment of insulin and oral hypoglycaemic agents on dialysis and non-dialysis days. We aimed to determine whether adults with diabetes admitted to inpatient dialysis unit were managed in accordance with national guidelines.

Aim

Assess glycaemic management of haemodialysis inpatient with co-morbid diabetes against JBDS guideline for management of adults with diabetes on the haemodialysis unit.

Method

A retrospective case note review of 130 haemodialysis patients, with co-morbid diabetes, admitted to the renal inpatients unit between April–June 2016 were included. This data was audited against criteria from JBDS guideline assessing number of hypoglycaemic episodes in each patient to determine whether this was associated with

1. Dialysis versus non-dialysis days
2. Time to control hypoglycaemic episode (Target time to control hypoglycaemia within 30 minutes)
3. Length of stay

Results

In total 130 cases were identified. The majority of patients had Type 2 diabetes with a mean age of 69 years (SD±11.8) 59% males and females 40.5%. The ethnic mix reflected the local population with a high proportion of Caucasian 35.5%, Asian 33% and Black 24.6%; ethnicity was not recorded in 4.3% of patients. The majority of patients had diabetes nephropathy as primary cause of their renal disease (73.3%). The mean HbA_{1c} 51.9 mmol/mol (SD±15) and 21% had HbA_{1c} below 42mmol/mol.

The median length of stay for patient who had hypoglycaemic episodes whilst an inpatient was 9 days.

Majority of the patient (57%) had hypoglycaemic episodes on days of dialysis (Figure 1).

Figure 1 Dialysis versus non dialysis days

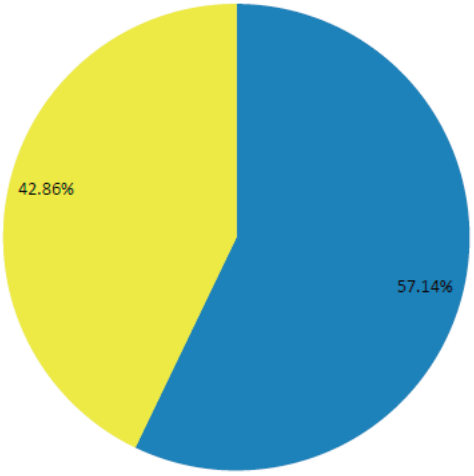
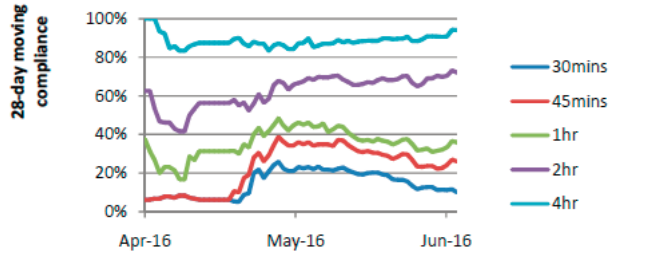


Figure 2 Time to control hypoglycaemic episode



Discussion

In our population, we found that 29% of patients had hypoglycaemic episodes during the study period. Only 14% patients had their hypoglycaemic episode controlled within 30 minutes. Time to adequately treat hypoglycaemia varied between 30min and 4hours in the majority of cases with over 40% treated adequately within 45mins. There are little published data in this cohort available for comparison.

Most of the patients had a long duration of diabetes with multiple diabetes related complication such as gastroparesis which increases risk of hypoglycaemia and delay in managing it. Within this subgroup of patients, improving diabetes control and attainment of treatment target values is known to be more difficult to achieve.[3]

This audit reiterates the importance of adjusting of antihyperglycaemic medication for dialysis and non-dialysis days. Overwhelming majority of patients (57%) had hypoglycaemic episodes on days of dialysis. Diabetes therapies must therefore be adjusted around dialysis regimens in order to minimise the risk of hypoglycaemia.

The audit findings do suggest that improvements can be made by introducing specific care pathways for diabetes inpatients receiving haemodialysis. This is particularly around monitoring of capillary blood glucose levels pre and post dialysis, management of hypoglycaemia as well as prescribing of anti hyperglycaemic agents on dialysis and non dialysis days.

Conclusion
The findings of this audit will be used to inform quality improvement work in the glycaemic management haemodialysis inpatients with co morbid diabetes.

References
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Early death in type 1 diabetes

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Introduction
We carried out a Morbidity and Mortality analysis of patients with Type 1 diabetes who attended our clinical service who had died under the age of 45 years to see what could be learned.

Method
The post mortem reports, recorded cause of death and clinical records were reviewed.

Results
We noted the following features: causes of death included Diabetic Ketoacidosis in three; atherosclerosis in three and diabetes mellitus was mentioned in part of the death certificate in all of them. Clinical records revealed that all had microalbuminuria, three had substance abuse and all had acute hospital attendances within four months prior to death. Post mortem revealed significant coronary artery disease in three cases. All were known to both medical and specialist nursing staff and had significant input in the months prior to death.

Discussion
This analysis really underlines the significant risk of death in young people with diabetes who have chaotic lifestyles. The significant coronary artery disease found on PM might indicate a need to really address cardiovascular risk factors aggressively in this high risk subgroup of those with Type 1 Diabetes despite their young age.

The outcome of renal biopsy in patients with diabetes

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The clinical consequences of the results obtained by kidney biopsy in patients with diabetes mellitus Type 1 or Type 2 have been controversial. Our study was conducted to assess histological diagnoses in patients with diabetes mellitus Type 1 and Type 2 undergoing kidney biopsy.This retrospective analysis includes the biopsy findings of all the consecutive renal biopsies of patients with diabetes mellitus Type 1 or 2 from October 2015 to October 2016 examined by standard histopathological procedures. The main outcome measures were the incidence of diabetic nephropathy (DN) and glomerulonephritis (GN) and their subsequent treatment measures taken. A total of 54 renal biopsies were done in Dorset county Hospital between October 2015 to October 2016. 10 out of the 54 patients were diabetic 6 were males and 4 were females, 5 patients out of the 10 had diabetic nephropathy 4 of the remaining 5 had features suggestive glomerulonephritis in addition to diabetic nephropathy, 1 patient had amyloidosis, 2 patients had FSGS, 1 was diagnosed with CLL and 1 patient had membranous nephropathy. The nondiabetic renal disease is a common finding in patients with long-standing diabetes. In conclusion, it is difficult to differentiate NDRD and DRD based on just clinical and lab findings.Diabetic retinopathy does not rule out NDRD. Kidney biopsy is an important diagnostic tool to define underlying renal disease in type 2 DM patients with proteinuria and/or sudden decreasing of renal function with absence of DR.

Association between diabetic foot ulcers, acute kidney injury and chronic kidney disease

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Background
The increased incidence of foot ulcers(FU) prior to the initiation of chronic dialysis in patients with diabetes mellitus may be explained if the presence of a chronic FU accelerates a decline in renal function. We sought to examine this further by describing changes in renal function associated with hospitalisation for diabetic FU management.

Method
Diabetic patients with a primary diagnosis of FU and sufficient biochemical results from routine clinical care were identified. Absolute creatinine and eGFR values were collected from six months (+/-1 month) pre and post hospital admission.

Results
95 patients were suitable for inclusion. 67 men, 68yrs (range 31-96) and 82% of patients had pre-existing CKD1-4.

Renal function was worse after an admission with an active diabetic ulcer. Six months prior to hospital admission the median eGFR was 70ml/min/1.73m2 (IQR 41) compared to 64ml/min/1.73m2 (IQR 46) six months after admission, p=0.01.

28% of the admissions were associated with acute kidney injury (AKI stage 1 to 3; 20,6,1 patient respectively). Patients who had sustained AKI during the admission had larger changes in eGFR (difference between 6 months pre and 6 months post admission) than those patients without; 0ml/min/1.73m2/yr(IQR 13) versus -8 ml/min/1.73m2/yr(IQR 23), p=0.07.

Conclusion
These pilot data add strength to the hypothesis that an active dia-

betic FU may contribute to a decline in renal function, particularly when associated with an episode of AKI. These results support additional prospective epidemiological and mechanistic studies to further explore the relationship between diabetic FU, AKI and CKD progression.

An unusual case of rapidly progressive chronic kidney failure in patient with insulin treated Type 2 diabetes and chronic microvascular complications

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Abstract

68 yrs old lady with insulin requiring diabetes of 15 years and chronic microvascular diabetes complications including microalbuminuria and stable CKD2 presented to the diabetes follow up clinic with 2 weeks history of the variable minor symptoms including lethargy, nosebleeds, and eye symptoms (watering and stinging). PMHx include a previous episode of Granulomatous poliangiitis 24 years ago, treated with immunosuppressive agents for two years. The routine bloods showed rapidly increasing creatinine, nephritic proteinuria of 3.1gm/24 hrs, red blood cells in urine sediment and negative Bence-Jonce protein. The vasculitis screening showed positive ANCA 1:320 and positive MPO 57. She was reviewed by Nephrologists, the kidney biopsy confirmed relapsing ANCA associated vasculitis. The Granulomatous poliangiitis affects primarily lungs and kidneys, the incidence rate is 10-20: 100 000. Patient responded well to the treatment course with Cyclophosphamide and steroids and continues under joint care with Nephrology and Diabetes Consultants&Teams. This case highlights the relevance of detailed past medical history and multidisciplinary approach in treatment of complex diabetic patients.

Three-times-weekly insulin therapy: the Hammersmith haemodialysis experience

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Diabetic nephropathy is the most common cause of end-stage renal disease; therefore a significant proportion of patients entering most renal replacement programs will now have diabetes mellitus. Insulin resistance and reduced insulin clearance predisposes to swings in glycaemic control in diabetic nephropathy; however, haemodialysis results in improved insulin sensitivity. Glycaemic control is therefore difficult to achieve in the context of haemodialysis and the optimal treatment regimen is not known.

At Hammersmith Hospital, the largest renal and transplant service of its kind in Europe, we have found three-times-weekly insulin therapy to be highly successful for patients with type 2 diabetes undergoing haemodialysis three times a week. A long-acting insulin analogue is administered just before haemodialysis with the aim of controlling glycaemia using three insulin injections weekly and can be used alongside oral hypoglycaemics. Compared with reno-competent comparatives, these diabetic patients with renal insufficiency have a longer excretion time of insulin; meaning that the administered insulin continues to work in the period between haemodialysis sessions. We have found that due to the long-acting nature of the insulins used, our patients have a flatter glycaemic profile and experience fewer episodes of hypoglycaemia.

We propose to report a range of patients who have benefited from three-times-weekly insulin therapy, including patients with poorly controlled diabetes mellitus, patients who were unable to manage insulin injections at home and patients with a poor social set-up to support insulin injections.

Effect of dapagliflozin on renal function

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Aims

While there are isolated incidents of deterioration in renal function due to sodium glucose cotransporter 2 (SGLT-2) inhibitors in clinical trials, there is experimental evidence supporting that SGLT-2 inhibitors are nephroprotective rather than nephrotoxic. Our aim was to investigate changes in renal function before and during treatment with dapagliflozin in our routine clinical setting.

Methods

A retrospective study of patients who had been initiated on dapagliflozin and had undergone at least one follow-up visit. A paired-t test was performed to examine changes in serum creatinine and estimated glomerular filtration rate (eGFR) before and during treatment with dapagliflozin.

Results

We identified 148 patients (63% male) who had received a mean duration of treatment of 15.6 ±8.7 months. The mean age of these patients was 57.8 ±9.0 years. For the whole group, there was no significant changes in pre and post treatment serum creatinine (76 ±18 v 77 ±21mol/L, P=0.509) and eGFR (92 ±23 v 92 ±24 mL/min per 1.73 m2, P=0.983). A modest but significant reduction in SBP (139 ±19 v 134 ±19mmHg, P=0.002) and DBP (79 ±10 v 77 ±8mmHg, P=0.025) was observed. Significant reduction in HbA_{1c}, body weight and BMI were also observed. In those individuals with follow-up less than 6 months (n=23), eGFR reduced from 87 ±20 to 80 ±20 mL/min per 1.73 m2, P=0.02).

Conclusion

No significant change in renal function was observed in our sample of patients who had received treatment with dapagliflozin for a mean duration of 15.6 months.

Anti-diabetic therapy in patients with type 2 diabetes and chronic renal impairment

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Aim
Choices of glucose lowering medication are limited for people with type 2 diabetes (T2DM) and chronic kidney disease. The aims of this study were to investigate choices of anti-diabetic therapy in T2DM with chronic renal impairment, to examine glycaemic control and cardiovascular (CV) risk factors in relation to CKD stages.

Method
Adults T2DM who were on any glucose lowering therapy, between January and December 2014 in ABMU heath board were identified from Secure Anonymised Information Linkage database. Demographic data, medication (anti-diabetic, aspirin, statin, and ACEI/ARB) usage, HbA_{1c}, lipid profile and blood pressure were collected.

Results
Of 13306 T2DM patients, 9589 (52% male) were on anti-diabetic medication. There were 8363 patients with mild renal impairment (MILD), 1137 with moderate renal impairment (MOD) and 85 with severe renal impairment (SEV). Duration of diabetes and prevalence of IHD was higher in MOD and SEV groups. The MILD group were younger, had worse glycaemic control and lipid profile; and higher BMI, compared with MOD and SEV groups. The SEV group had highest prevalence of insulin and aspirin usage and lowest prevalence of metformin and ACEI/ARB usage. Sulphonylurea, DDP-4 inhibitor and statin usages were comparable among three groups. 20% of those with severe renal failure were prescribed metformin.

Conclusion
Optimising of glucose control and CV risk factors modification should be done proactively in the MILD group who had significantly lower incidence of IHD. Anti-diabetic medication in particular metformin should be reviewed in those with severe renal failure.

Enhanced care between services leading to Improved outcomes in diabetes patients with ESRD

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Introduction
The incidence and prevalence of diabetes have grown significantly throughout the world and this has led to an increase in diabetic kidney disease. Diabetes is the leading cause of end stage renal disease (ESRD) accounting for 50% of cases. Historically patients with Diabetes and ESRD were more disadvantaged by comorbid disease and suffered higher mortality rates.

Setting
We report the outcomes from a contemporaneous cohort of diabetes patients (DM) in comparison with non-diabetes patients (nDM) with ESRD over period of 10 years. The care of DM patients has been shared and coordinated between the renal and diabetes services. HD and PD patients have received extra support from the diabetes service with dialysis unit review and the use of joint clinics.

Results
There were 389 patients with DM and 629 with nDM on RRT (pre-emptive transplants, haemodialysis and peritoneal dialysis). Average age was 63 years with DM V 62 years in nDM. Average pre-dialysis follow-up for DM was 24 months and 21 months for nDM and late presentation in DM was significantly less (16.7%) V nDM (28.2%, $p<0.05$). Pre-emptive transplantation was more common in nDM patients. DM had a significantly higher comorbidity burden, (Stoke Comorbidity index). Haemodialysis was used in 70.6% of DM and 63.4% on nDM cases, $p<0.05$. The use of central venous catheters at dialysis initiation were similar in (51.4% DM V 57.1% nDM, $p=0.08$)

Despite comorbidity, the 1 year survival was no different in both groups (81.3% DM v 81.1% nDM, $p>0.05$). Review of an earlier case cohort noted a 1 year survival of DM cases being 73.8% V 80% nDM. Multivariate analysis noted that patient survival was influenced by advancing age, late referral to renal services and the reliance on dialysis venous catheters at RRT initiation. DM was not an independent risk factor as noted in other studies (Hazard ratio 1.09, 95% CI 0.87 to 1.29, $p=0.564$).

Summary
Services have been aligned to improve patient care through close working between the two specialities. As a result, more DM patients are referred in a timely manner for RRT preparation. Despite the increased comorbidity burden faced by DM patients, their survival on RRT is now similar to the non DM cases. Vascular access for dialysis remains an important modifiable risk factor for all ESRD patients.

Implications
An enhanced process of shared patient care between diabetes and renal services can be applied in many centres, leading to better patient outcomes.

Audit of secondary care diabetes and renal follow up in patients with moderate to severe CKD

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Introduction
We aimed to assess what proportions of patients, with varying degrees of severity of diabetes mellitus and chronic kidney disease, are under follow up in primary and secondary care.

Methods
Using our pathology system, we identified patients with an HbA_{1c} > 48 mmol/molHb and renal function, between April and September 2016, randomly selecting patients for each stage of CKD. We determined their HbA_{1c} level, CKD classification, annual urine ACR and if they were under secondary care.

Results
82 of 347 patients (24%) did not have a urine ACR checked within the last 12 months.

% receiving secondary diabetes care with CKD >3:
- With HbA_{1c} >74 mmol/molHb - 25% (n=76)
- With HbA_{1c} 58-73 mmol/molHb - 23% (n=87)

% of patients with diabetes receiving renal secondary care:
- CKD 4 group - 36.6% (n=101)
- CKD 5 group - 78.8% (n=33)

48 (13.8%) of patients were found to have a HbA_{1c} of > 90 mmol/molHb, of which only 9 (18.8%) of them were seen in diabetes secondary care.

Of all the patients under the care of the renal team (n=65), only 44.6% of these were also jointly under the care of the hospital diabetes team.

Conclusions
Our results show significant under-representation of secondary diabetes care in those with poor glycaemia and among those with poor kidney function. These patients are likely to benefit most from established therapies. Our aim is to integrate a revised pathway with periodic interrogation of electronic databases to identify patients who may benefit from collaborative follow up.

Anaemia in patients with diabetes and chronic kidney disease

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Background
Patients with diabetes and CKD are more likely to be anaemic and, anaemia is associated with increased cardiovascular risk. We assessed the prevalence of anaemia amongst patients with diabetes and CKD and looked at the correlation between anaemia, HbA_{1c} and eGFR.

Methods
We looked at 509 patients aged above 19 years with either eGFR < 60 ml/min or with a raised urine albumin creatinine ratio. Data was analysed using Graphpad Prism 7.

Results
98% of patients had a full blood count measured and 19% were anaemic (Hb < 110g/L). The mean Hb for all patients was 112 (± 18.8) g/L. Hb correlated positively with eGFR ($p < 0.0001$) and urine ACR was significantly higher in patients with anaemia compared to patients without anaemia ($p < 0.01$). Hb also correlated positively with HbA_{1c} ($P < 0.0036$). Only 59% of patients with identified anaemia had haematinics measured. No patients had fructosamine measured as an alternate measure of glycaemic control. Only 82% of patients with anaemia were on lipid lowering drugs.

Conclusions
The management of cardiovascular risk factors was similar in patients with or without anaemia. It is likely that physicians do not recognise anaemia as an independent risk factor for cardiovascular disease. Increased awareness of this risk factor should prompt further investigation and management of this and other cardiovascular risk factors.

Assessing the prevalence of cardiovascular risk factors amongst patients with diabetes and chronic kidney disease

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Background
Patients with diabetes and CKD have an increased risk of cardiovascular mortality. Thus there is a need to focus on and intensively manage cardiovascular risk factors.

Methods
509 patients were identified aged above 19 years with either eGFR < 60 ml/min or with a raised urine albumin creatinine ratio.

Results
The majority of patients were male (61%) with type 2 diabetes (82%). We found a high proportion of overweight and obese patients. The range of BMI was from 18.8 to 58.5. We did not find any association between BMI and eGFR or urine ACR using simple correlation or linear regression. 99% had cholesterol measured and 79% were on a statin. BP was recorded in 85% of patients and was on target in 38%. 50% of patients were on ACE inhibitors and 22% on ARB. Some documentation of care processes was poor; only 65% had smoking status recorded, 46% had foot examination documentation and 32% had documentation of retinal screening. Alternatively, 100% had eGFR recorded and 89% had urine ACR recorded.

Conclusions
We found an increased prevalence of obesity and hypertension amongst our patients with diabetes and CKD, compounding the risk of cardiovascular disease. Despite this, less than half the patients were on aspirin and a significant percentage were not on lipid lowering treatment or ACE inhibitors/ARB. A holistic approach to care should involve intensive management of all cardiovascular risk factors to reduce morbidity and mortality.

A comparison between the joint renal diabetes clinic and general diabetes clinics in a district general hospital

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Background
Diabetic nephropathy is the leading cause of end stage renal failure. The progression of diabetic nephropathy can be reduced through the intensive management of blood pressure, lipids and glycaemic control. This intensive management may be achieved through joint renal diabetes clinics.

Methods
This was a retrospective review of patients aged above 19 years with either eGFR < 60 ml/min (KDIGO stage 3) or with a raised urine albumin creatinine ratio (urine ACR) above 2.5 (men) or 3.5 (women). 509 patients were identified (out of a total population of 1715). Out of these, 30 were excluded (died or serial DNAs).

Results
Out of 479 patients, 9% were under the joint renal clinic. The majority were under the general diabetes clinic (64 %), the rest were under other specialised diabetes clinics e.g. joint diabetic foot clinic (13%).

For most care processes, patients under the joint renal clinic had higher recorded percentages of completion. For example, 100% of patients had a recorded smoking status, compared to 61% in other clinics. Measurement of hypoglycaemia, vitamin D, PTH, anaemia and cardiovascular risk profiling were also enhanced in patients under the joint renal diabetes clinic.

Conclusion
We have shown that patients under specialised renal diabetes clinics have higher attainment of recorded processes of care. Our next challenge will be to audit the patients under the joint renal clinic over time to see if enhanced monitoring leads to improved disease progression.

Audit on the management of microalbuminuria in people with type 2 diabetes in secondary care

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Aims
To audit the adequacy of management of microalbuminuria in people with Type 2 diabetes.

Methods
Audit data was collected using integrated diabetes register for 1,511 people with Type 2 diabetes who attended diabetes clinics from 1st February 2013 to 30th November 2013. It was analysed and compared against NICE guidelines for chronic kidney disease and diabetes.

Results
5% of people who attended diabetes clinics did not get their urine tested for microalbuminuria. Out of those with microalbuminuria or proteinuria, 40% had systolic blood pressure equal to or more than 140mm Hg and 79% had their HbA_{1c} equal to or more than 48mmol/l. 59% of those with persistent or progressive microalbuminuria and on renin aldosterone system antagonists, were on submaximal doses of renin-aldosterone system antagonists. Those individuals who were on angiotensin converting enzyme inhibitors plus angiotensin receptor blockers (double blockade) in 2013, 73% continued with both drugs.

Conclusions
Full compliance with national guidelines for microalbuminuria screening and management had not been achieved. Therefore, it was recommended that microalbuminuria status should be routinely reviewed amongst diabetes clinic attendees and treatment should be optimised. Those without updated screening should be flagged and liaised with GPs to ensure regular screening. Those who are on dual blockade should be reviewed to ensure that they continue with single renin-aldosterone system antagonist only. It is important to screen for microalbuminuria and optimise the management in those who are diagnosed with microalbuminuria in order to achieve improved outcomes.