Abstracts from the Association of British Clinical Diabetologists (ABCD) meetings

Abstracts from the Spring 2007 meeting

The ABCD meeting organising panel selected the top six abstracts for publication in *Practical Diabetes International*. All abstracts presented at the meeting were considered to be of a high standard and can be viewed in full on the journal online at http://www.interscience.wiley.com.

Squamous cell carcinoma in a heel ulcer in a patient with diabetes

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Chronic overexposure to the sun is the primary cause of nearly all cases of squamous cell carcinoma (SCC).

We report a case of an SCC found on the heel of a 73-year-old man with type 2 diabetes. He had had a left heel ulcer since December 2004 which had been caused by injuring himself on the footrest of his wheelchair whilst getting out of bed. His left heel had ulcerated on two previous episodes as a result of heel fissures and of the fact that he had used his heel to prop himself up in bed. These had healed with the use of pressure relief, antibiotics and regular debridement. He had a right above knee amputation in 1985 following a road traffic accident. He had good pedal pulses but was known to have peripheral neuropathy. The ulcer initially showed good signs of healing with antibiotics, offloading and regular debridement but became very painful. On review in October 2005 the heel was discharging pus. X-ray showed no evidence of osteomyelitis. An attempt to aspirate pus from the wound by the orthopaedic team was unsuccessful. MRI scan showed no bone involvement and the lesion was within superficial tissue. When reviewed in the foot clinic an underlying malignancy was suspected due to the appearance of the wound. Biopsy confirmed an SCC.

Conclusion: Malignant changes to chronic wounds can occur and are thought to be the result of chronic irritation of the wound. To our knowledge this is the first case of an SCC occurring in the foot. Any unusual-looking foot ulcer should be biopsied.

Does MODY behave the same during pregnancy as other types of diabetes?

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Aim: To see if patients with MODY follow the same pattern of glycaemic changes as those with type 1 and 2 diabetes, during pregnancy.

Method: We looked retrospectively at case records of 3 patients including 1 case of HNF4α, 1 of glucokinase and 1 of HNF1α MODY.

Findings: The HNF4α patient required an average of 11 units of insulin once daily for the final 10 weeks of her 1st pregnancy, and 6 units from the 16th to 37th week during her 2nd pregnancy. She delivered at 38 weeks in the 1st pregnancy and 39 weeks in the 2nd one. The 1st baby weighed 3311g and the 2nd was 3475g. The glucokinase MODY patient had twins. She started at 3 units on average, twice daily of soluble insulin in the 3rd week and changed to mixed 30/70 from the 12th week, and was on 10 units twice daily in the last 20 weeks. She delivered 2 boys who weighed 2300g and 2630g. The HNF1α patient started insulin in the 36th week at an average of 5 units in the evening. She did not need insulin during her 2nd pregnancy. She had a boy (weight 3970g) at 39 weeks from her 1st and a daughter (weight 4220g) from her 2nd pregnancy. HbA_{1c} was below 6.5% during all pregnancies. None of these patients was on insulin or oral agents, pre- or post-delivery.

Conclusion: This is a small cohort of MODY pregnancies and larger studies are required. These cases show that all our MODY patients used relatively little or no insulin. Ideally we need a central database for MODY pregnancies to identify the optimal treatment pre-conception and during pregnancy.

Olanzapine-induced hyperglycaemic, hyperchloraemic, hyperosmolar state: a case report

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A 44-year-old African man presented with a week history of increasing tiredness, lethargy, marked polydipsia and polyuria. For more than 5 years, he was taking olanzapine 10mg daily for psychotic disorder. He had no other medical history of note and no family history of diabetes.

At presentation he was clinically dehydrated and had altered mental status. Examination showed the following: pulse 130/min, respiratory rate 26/min, BP 120/70, BMI 24, urine analysis glucose 3+ and ketones 2+, serum sodium 180, potassium 3.8, urea 11.5 and creatinine 122, bicarbonate 29, chloride 143, glucose 62.5mmol/L, normal liver function test, urine and blood culture negative, HbA_{1c} 15.7%, and flutamic acid decarboxylase and islet cell antibodies negative.

After initial IV fluid and insulin, he was switched to SC insulin. Olanzapine was discontinued. At follow up, insulin was stopped and metformin started. About 5 months after initial presentation HbA_{1c} was 6.2%.

Discussion: Olanzapine-induced hyperglycaemia is typically seen in older patients, within 2 years of starting therapy. Postulated mechanisms are drug-induced damage to pancreatic β cells, drug-induced weight gain causing impaired glucose tolerance, altered sympathetic nervous system regulation of glucose control and insulin release.

Our patient remained weight neutral during olanzapine therapy. We postulate that factors related to his mental illness and olanzapine had interfered with his ability to respond to thirst of hyperglycaemia leading to a hyperosmolar state.

Clinicians should be aware of a hyperglycaemic, hyperosmolar state with olanzapine and continue to look for warning signs even after several years of therapy.

An audit of the effectiveness of insulin conversion in obese patients with type 2 diabetes mellitus in a specialist setting

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A retrospective case note audit of 37 patients was performed to review the impact of insulin conversion at 1 year in obese (BMI >30kg/m^2) patients with type 2 diabetes mellitus seen in our specialist service.

Twenty-eight patients were commenced on insulin in the non-acute setting. The mean duration of diabetes was 11 years. The indication in the majority was poor glycaemic control. In 9 patients insulin was commenced in the acute setting, usually following a myocardial infarction. All patients were on insulin only

and not oral agents including metformin. Over 80% were commenced on a twice-daily biphasic insulin regimen. At one year, almost 10% of these had been converted to a basal bolus regimen. The starting dose of insulin had been doubled at 1 year (mean 0.6U/kg). The mean HbA_{1c} at insulin initiation was 8.4%. This fell to 7.4% at 1 year. At insulin initiation, 46% were obese class I (BMI 30–35kg/m^2). At 1 year this had risen to over 60%. The proportion that were obese class II (BMI 35–40kg/m^2) and morbidly obese (BMI >40kg/m^2) also increased.

Based on the documentation, most patients were not advised about the possibility of weight gain on insulin nor referred to a dietitian. Despite NICE guidance on the use of pharmacotherapy and weight reducing surgery, these modalities were not considered in any of the cases.

Despite the reduction in HbA_{1c} following insulin conversion, significant weight gain occurred in the majority which could ultimately counterbalance the improvement in glycaemic control achieved.

If we spend more money do we get better outcomes?

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Introduction: In recent years there has been an increase in the use of newer and more expensive treatments for diabetes, blood pressure and cholesterol with little clear evidence of added clinical value. We aimed to establish whether primary care organisations (PCOs) with higher treatment costs were more likely to achieve Quality and Outcomes Framework (QOF) targets.
Methods: QOF outcomes for diabetes (DM 6: HbA_{1c} <7.4%), blood pressure (BP 5: <150/90) and cholesterol (CHD 8: <5mmol/L) were compared to treatment costs for all 92 PCOs in the North of England for 2005–6. Treatment costs were the total Net Ingredient Cost (NIC) of treatments from the relevant *British National Formulary* section divided by the number of people with that condition. QOF outcome data were accessed from www.gpcontract.co.uk.
Results: PCOs showed a 2–3-fold variation in treatment costs for each condition. A negative correlation between treatment costs and outcomes was observed for diabetes (r=-0.27, p=0.009). There was no correlation between costs and outcomes in blood pressure (r=-0.078, p=NS) or cholesterol (r=0.038, p=NS).
Discussion: These results suggest that increased treatment costs, possibly representing higher usage of more expensive treatments, do not necessarily confer extra benefit and improved outcomes. Possible confounding factors include differences in socioeconomic demographics, clinical need, medication adherence or QOF exception reporting. However, these are minimised by the sheer size of the data set, including 92 PCOs and over 500 000 people for the diabetes outcomes.
Conclusion: These data would suggest that more expensive therapies do not necessarily produce better outcomes. Usage should be minimised until there is clear evidence of additional clinical value.

An audit of compliance in a DGH with the ABCD guidelines on the management of diabetic ketoacidosis (DKA)

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Introduction: The management of this potentially life-threatening presentation frequently lies with non-specialist general physicians, with significant differences in the management of DKA between teams and hospitals. To help establish best practice, the ABCD has published management guidelines. We have audited our current practice against these guidelines prior to their local implementation.

Other presentations at the ABCD Spring 2007 meeting (available online)

- Effectiveness of GPSI clinics *(AA Kumar, K Lois, J McMorran, M Wallace, M Mistry, L Dodd, J Hancox and A Anwar, on behalf of the Coventry Diabetes Service)*
- Baseline audit of diabetes services for young adults (aged 16–25) at North Tyneside General Hospital *(C Emmett, N Lewis-Barned, L Oliver, J Morgan, G Dovey-Pearce and B Young)*
- Urine dipstick testing in diabetic clinics: a traditional practice with overlooked results *(T Bhutta, IF Cassson and GV Gill)*
- Management of nephropathy and microalbuminuria in routine diabetes services: room for improvement? *(A Khan, GV Gill and A Woodward)*
- An audit of lipid management in diabetic patients attending an annual review clinic in Countess of Chester Hospital *(A Mon, G Sreemantula, N Goenka, RC Worth and DL Ewins)*
- An unusual cause of acute renal impairment in a patient with type 2 diabetes mellitus *(KR Narayanan, S Eliades, N Torpey and C Oxynos)*
- Charcot neuroarthropathy of the knee joint in a patient with type 2 diabetes *(V Nayyar, A Beri, R Jogia, M-F Kong and S Jackson)*
- Success stories of insulin reduction and weight loss in type 2 diabetes. Perils for the unwary in 'treating to target' *(P Vas and J Roland)*
- Severe hypoglycaemia in the community *(AR Scott and E Frampton)*
- Management of diabetes at secondary care: a district general hospital experience *(H Siddique, S Hussein, C Joyce, P Coates and P Daggett)*
- Managing pregnancy with multiple diabetes related complications *(M Ul-Haq and P Chattington)*
- How important is arbitration grading upon both grading and referral within a digital diabetic retinopathy screening programme? *(KH Whitehouse, HC Seymour, R Leigh, B Keown, M Clarke, REJ Ryder and PM Dodson)*

Methods: A retrospective audit was performed on notes from all admissions within a 12-month period with a diagnosis of DKA. We audited compliance with 5 clinical indicators drawn from the ABCD guidelines (clinical and laboratory assessment of severity; use of arterial blood gas [ABG] sampling; management of fluids and insulin; monitoring of progress; and follow-up care).
Results: When compared with the new guidelines, monitoring of baseline blood chemistry was high (100%), whereas assessment of severity by venous bicarbonate was low (23%). Utilisation of laboratory blood glucose was sub-optimal (46%), and 67% of ABGs were inappropriate. 61.5% of fluid regimens were greater than advised. Sliding scales were insufficiently monitored – with only 15% having hourly measurement. In 38% there was no overlap of IV and SC insulin, with a delay of 6 hours in one instance. The rate of referral to the diabetes team was low at 39% of cases.
Conclusions: There are significant differences between current and advised practice. These lie predominantly in assessing the severity of DKA, utilising laboratory investigations, and in the management of fluids and insulin. Successful implementation of these guidelines will require ongoing education of all providing acute medical care.

Effectiveness of GPSI clinics

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Objective: To assess the impact of a new GPSI (General Practitioners with Special Interest) service.
Methods: An audit of the demographic and clinical characteristics together with the impact of intervention was based on the records of 134 patients.
Results: A total of 134 case notes were audited, 60 male:74 female (age 20–90 years). 70.1% had type 2 diabetes and 11.2% had type 1 diabetes. The most common cause for referral (86.5%) was poor glycaemic control, 7.4% of patients had newly diagnosed diabetes and 2.2% had recurrent hypoglycaemic attacks. The most common comorbidity was hypertension (42.5% of patients), 37.3% had dyslipidaemia, 22.3% were obese and 11.3% had ischaemic heart disease.

Erectile dysfunction was the most common complication (16.6%), followed by neuropathy (11.9%), nephropathy (10.4%) and retinopathy (6.7%). The most common intervention was lifestyle advice, offered to 43.2% of patients, followed by a change to ACE inhibitor, insulin and metformin therapy at 25.37%, 24.62% and 21.64% respectively. Following intervention, 60% of patients showed an improvement in their overall glycaemic control, 64% in their total cholesterol levels, 54% in triglycerides, 56% in LDL and 33% in HDL levels.

A simultaneous questionnaire to assess the level of satisfaction amongst patients received 31 responses. Over 80% were satisfied with time spent talking to staff, 74% were satisfied with the waiting time, and 65% were satisfied with the dietary advice offered and information regarding results. 61% were happy with the information provided regarding treatment and its effects. 58% of patients were satisfied with the 'one-stop shop' ethos of the clinic.
Conclusion: The GPSI clinic resulted in improvement in the overall glycaemic control, lipid levels and was associated with a high level of patient satisfaction, making it an effective intermediate referral service.

Baseline audit of diabetes services for young adults (aged 16–25) at North Tyneside General Hospital

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Introduction: Patients with diabetes should have annual screening for complications. We looked at the extent to which this happens for young adults at North Tyneside General Hospital (NTGH).
Method: The following data were sought for all patients aged 16–25 being seen for diabetes at NTGH (n=129): HbA_{1c}; blood pressure; retinal screening; podiatry review; nephropathy screening; cholesterol; and smoking status. We looked for evidence of what had been done/was recorded as having been done in the past 18 months. Data were compared with results from the National Diabetes Audit, primary care (Quality and Outcomes Framework results) and other centres.
Results: The mean (SD) HbA_{1c} was 9.2% (2.2%). Glycaemic control was comparable with other centres, although more patients had a high HbA_{1c} (>9.6%). Complication rates were also similar. Foot screening and smoking discussion were done less frequently. Contraception and pregnancy were discussed with only 40% of women.
Conclusions: Screening remains incomplete for this group. Engagement with young people and liaison with primary care are essential to ensure that all patients are adequately reviewed. Since >90% had been seen by a health professional in this 18-month period, an approach is needed for completing annual medical review wherever the patient makes clinical contact. A transitional programme to facilitate transfer between paediatric and adult services is being set up and future audit could be done to assess its impact.

Urine dipstick testing in diabetic clinics: a traditional practice with overlooked results

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Background and aims: Semi-quantitative 'dipstick' testing of urine is traditionally performed at diabetic clinics. Its value, however, is uncertain, and abnormal results are not always acted upon. We have audited the action taken on abnormal dipstick urine tests in our clinic, concentrating on positive (more than trace) protein and blood results.
Methods: A retrospective consecutive case-note review was undertaken and 80 patients were found who had positive tests for protein and/or blood.
Results: There were 41 (51%) with proteinuria, 20 (25%) with haematuria, and 19 (24%) with both. In 40 patients (14 proteinuria, 18 haematuria, and 8 both) the abnormality was not previously known, and in 24 cases (60%) inappropriate action was taken. This involved failure to document the abnormality, and to send a specimen for mid-stream urine (MSU) culture. In contrast, previously known haematuria and proteinuria had always been acted upon (with urine culture, and if necessary renal ultrasound, cystoscopy, 24-hour urinary protein etc).
Conclusions: We conclude that newly found positive urine dipstick results for protein or blood in diabetic clinic patients are often not noticed or acted upon. Simple measures such as highlighting the results in the notes, or encouraging the nurse undertaking the test to send an MSU sample, may greatly improve this problem.

Management of nephropathy and microalbuminuria in routine diabetes services: room for improvement?

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Background and aims: Diabetic renal disease is a major cause of morbidity and increased cardiovascular mortality. Various treatment options can retard progression of nephropathy (DN) and microalbuminuria (MA) – notably tight blood pressure (BP) control and ACE/ARB drug treatment. We have recently audited our performance in managing DN and MA in a busy routine diabetes service.
Methods: Over a 6-week period, notes were examined of 200 consecutive type 2 diabetic patients. Demographic data, HbA_{1c}, BP, BMI and drug treatment were recorded on a proforma, and later transferred to a computer database.
Results: Of the 200 patients, 42 (21%) had MA, 35 (17%) DN, and 123 (62%) had normal renal function (N). Mean age was 63 y, duration of diabetes 12 y, BMI 33kg/m^2, and HbA_{1c} 8.2%. Systolic BP was 147±24 (MA), 145±25 (DN) and 140±21 (N). Diastolic BP was 70±9 (MA), 70±13 (DN) and 69±11 (N). There were 71% of MA and 67% of DN patients with BP levels >130/80mmHg. ACE/ARB drugs were used in 69% of MA and 80% of DN patients.
Conclusions: We conclude that there are still deficiencies in BP control and ACE/ARB drug use in patients with diabetic renal disease cared for in routine clinics. Improvement options may include specialist nurse-led involvement in their care, or a joint specialist clinic.

An audit of lipid management in diabetic patients attending an annual review clinic in Countess of Chester Hospital

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Introduction: Patients with diabetes have increased cardiovascular risks comparable to those with a history of cardiovascular event.

The Joint British Societies (JBS2) and the American Diabetic Association recommend targeting total cholesterol (TC) <4 and LDL-C <2 instead of the targets set by NICE and the GMS 2 contract (TC <5 and LDL-C <3). We audited the achievement of lipid control in diabetic patients attending our annual review clinic.
Method: Data were collected from the electronic diabetes register between 1 January 2006 and 31 December 2006 for age, duration of diabetes, BMI, TC and LDL-C. The number of patients achieving NICE lipid targets (TC <5 and LDL-C <3) and those achieving the new JBS2 targets were compared.
Results: 1456 patients were analysed with mean age of 45 years (range 17–92), mean duration of diabetes 20 years (range 1–65), mean BMI 28.7 (range 14–57) and mean HbA1c 8.5 (range 4.1–17.3). TC was recorded in 1365/1456 (94%) and LDL-C was recorded in 874/1456 (60%). 748/874 (85%) achieved TC <5 and LDL-C <3, but only 420/874 (48%) achieved both parameters of the JBS2 targets.
Conclusion: We managed good achievement of meeting NICE lipid targets. However, more than half of our patients failed to meet JBS2 lipid targets. More aggressive lipid management may be beneficial, but it is likely that substantially increased resources will be required.

An unusual cause of acute renal impairment in a patient with type 2 diabetes mellitus

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Background: Diabetes mellitus is one of the most common causes of renal impairment in the developed world. In most patients this is a microvascular complication leading in some patients to end stage renal disease. However, in some patients with diabetes the renal impairment is secondary to other causes, often reversible and hence important to recognise. We present a patient with type 2 diabetes who developed acute renal impairment secondary to allergic tubulo-interstitial nephritis caused by omeprazole.
Case report: A 65-year-old lady with type 2 diabetes was referred to the medical admissions unit by her general practitioner. She had had a diabetic pre-clinic blood test which showed a serum creatinine of 540µmol/L in the setting of previously normal tests. Initial investigations did not pick up a cause for the acute renal impairment. In spite of discontinuing lisinopril and furosemide and achieving good hydration, renal function did not normalise. In discussion with the nephrologists she underwent a renal biopsy which showed evidence of acute tubulo-interstitial nephritis. Our patient had been on omeprazole for years but had re-started this tablet two months prior to this presentation after stopping it for several months. It was therefore felt that this was the most likely cause for the interstitial nephritis. Omeprazole was discontinued and she was started on oral steroids. Renal function returned to normal over the following month. We will present a literature review on drug induced tubulo-interstitial disease.
Conclusions: A high index of suspicion is required to pick up potentially treatable causes of renal impairment in people with diabetes. It is important to take a detailed drug history including changes made by the patient.

Charcot neuroarthropathy of the knee joint in a patient with type 2 diabetes

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Charcot neuropathy is well recognised in patients with diabetes mellitus. Most commonly it affects the ankle joint and the fore foot. Involvement of large weight-bearing joints like the knee is rare but has occasionally been reported.

We report the case of a 69-year-old female with a 10-year history of poorly controlled type 2 diabetes mellitus, treated with insulin. She had peripheral neuropathy, retinopathy, and nephropathy and also hypertension and dyslipidaemia. She was attending our foot clinic for a neuropathic right plantar ulcer. When reviewed in July 2006 she reported a 2-month history of a painful swollen right knee. A deep vein thrombosis and a Baker's cyst had already been excluded by a Doppler ultrasound scan. There was no history of recent trauma. Her CRP and WBC were persistently elevated but were improving. It was originally felt that she had osteoarthritis or a septic joint. X-ray of the joint showed destruction of the tibial plateau which was suggestive of an erosive arthropathy or septic arthritis; however, a knee aspiration excluded a septic joint and no crystals were seen either. CT scan of the joint confirmed a Charcot joint. She is being managed conservatively with immobilisation with a Genurange cast.

Charcot neuropathy of the knee joint due to diabetes is rare but it is important to consider it in a diabetic patient who presents with a painful knee joint. When the knee is involved, and conservative treatment fails, standard surgical intervention often involves arthrodesis.

Success stories of insulin reduction and weight loss in type 2 diabetes. Perils for the unwary in 'treating to target'

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Background: 'Treat to target' algorithms if applied to obese patients with diabetes can lead to a spiral of increasing weight and insulin dose. We wished to study the reversal of this process.
Aim: To assess the effect of reduction in insulin dose on weight and HbA1c in obese patients with type 2 diabetes on insulin.
Method: A retrospective review of medical records of 15 insulin treated obese patients with type 2 diabetes who had a refractory HbA1c and increasing weight. The patients had been advised to progressively reduce their dose of insulin until/unless their glycaemic control demonstrably deteriorated. If necessary a glitazone was introduced to facilitate insulin dose reduction.
Results: The mean (±SEM) insulin dose dropped from 84.2(±11.3) to 29.2(±7.5) units ($p<0.001$) with 6 patients coming off insulin completely. This was associated with the patients' mean weight falling 11.9kg from 112.6(±6.6) to 100.7(±6.6)kg ($p<0.001$) and the mean HbA1c falling 0.9% from 10.2(±0.6) to 9.3(±0.6)% ($p<0.05$).
Discussion: The 15 obese patients studied clearly benefited from a reduction in insulin dose. However, current international 'treat to target' algorithms would have recommended instead an increase in insulin dose from their initial levels. Furthermore, had the algorithms been applied to patients' final HbA1c this would imply reversing all the advantages gained by the insulin reduction.

Severe hypoglycaemia in the community

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The new GP contract rewards practices for attaining specified quality targets, for annual complication screening and glycaemic control. Tighter control may increase the risk of hypoglycaemia.

Not all patients with severe hypoglycaemia will involve medical services. Of those that do, not all will be taken to hospital, as ambulance crews are now able to treat and leave these patients at home if they and the patient feel it is safe to do so.

Data were obtained from South Yorkshire Ambulance Service NHS Trust searching for any call-out that included the code for diabetes over a 6-month period from 1 October 2005.

There were 385 call-outs to people with diabetes. Of these, 285 had a blood sugar measured on arrival. The mean blood glucose of the group was 8.6±10.3 (mean±SD) mmol/L. 148 (55 females) had a blood glucose <4mmol/L. The mean age was 59±19 years. Seventy-two were aged over 60 years, 13 under 30 years.

Hypoglycaemia necessitating ambulance call-out is a frequent occurrence, affecting all ages including many older people with diabetes. This warrants further monitoring and investigation to ensure that the new targets for glycaemic control are not set unrealistically low.

This snap-shot of episodes of severe hypoglycaemia in the community needs confirming by a national survey which we are about to undertake.

Management of diabetes at secondary care: a district general hospital experience

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Introduction: The current UK prevalence of diabetes has exceeded 2 million people and is predicted to double over the next 10 years. Much of the burden of diabetes is due to the development of vascular complications, including cardiovascular diseases, retinopathy and nephropathy.

Aim: We prospectively analysed the quality of diabetes care and the level of intervention to reduce the micro- and macrovascular complications in our hospital.

Method and results: 85 patients were audited (84% type 2 and 16% type 1) using a set proforma in the outpatient setting. The mean HbA_{1c} was 8.59% ±1.68. 91.8% of patients had a record of their total cholesterol in the previous 15 months. The mean cholesterol level was 4.47mmol/L ±1.06. 71% of patients were on lowering agents; 62% were on statin therapy, 7% on a fibrate, 1 patient was on ezetimibe, 1 patient was pregnant. 29% were not on any cholesterol lowering agent. Only 34% of patients were on insulin. 32% of patients were on a combination of oral hypoglycaemic agents. 59% of patients were on aspirin treatment. Smokers were less compared to national standards (14% *vs* 15.4%). Only 3 patients had creatinine levels >150µmol/L and all of them (100%) were referred to nephrology.

Conclusion: Overall, the average glycaemic control in our cohort was poor. This may be partly because of the fact that well controlled patients were discharged back to primary care; however, aggressive interventions with early introduction of insulin may improve the clinical picture.

Managing pregnancy with multiple diabetes related complications

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Pregnancy poses significant problems for both mother and fetus in women with diabetes. Poorer pregnancy outcomes are seen in those with nephropathy or retinopathy. Overall, there are few studies of relative risk from pregnancy in patients with different pre-existing diabetic complications.

We wish to highlight some issues related to the management of pregnancy in a lady with type 1 diabetes and pre-existing autonomic neuropathy, nephropathy, retinopathy, poor glycaemic control and uncontrolled hypertension. The case raises ethical issues relating to her management including a decision by a different unit to reverse her sterilisation.

This patient's gastroparesis was exacerbated by pregnancy and she required prolonged hospital stays. A Hickman line was inserted due to poor IV access. She required IV cyclizine and high doses of antihypertensives throughout the pregnancy. Peripheral oedema deteriorated due to heavy proteinuria. At 20 weeks termination of pregnancy was discussed but was declined by the patient. She required prednisolone for the last 6 weeks. To the delight of everyone, a healthy baby was delivered at 34 weeks but has the pregnancy reduced her life expectancy and increased the risk of long-term diabetes complications? Coordinated studies across many units may help establish evidence of the relative risks that mothers with different complications run and would help to inform patients at pre-conception counselling.

Should we be supporting patients to conceive whatever the long-term consequences are to themselves and the amount of medical input required to achieve a successful outcome?

How important is arbitration grading upon both grading and referral within a digital diabetic retinopathy screening programme?

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Aim: In the English National Screening Programme for Diabetic Retinopathy, following first and second full disease grading, differences of outcome and grades may occur. Arbitration grading is assessed across both grade and referral outcome to evaluate primary and secondary grading accuracy.

Methods: Grading disagreements from screeners, graders and optometrists over a 9-month period were reviewed by arbitrators (KHW, REJR, PMD, MC) based within HEDRSC East, South, Central and West Birmingham; data were compiled prior to and after the refresher grading training for optometrists provided by HEDRSC. Results are analysed for grading consistency, and standards achieved. False-positive diagnosis and missed sight-threatening retinopathy are documented.

Results: 525 arbitration episodes were analysed. 371 were due to first full disease and 127 second full disease grade error; with 27 complete disagreement on both grades by arbitration. 61 encounters (11%) failed to identify referrable sight-threatening retinopathy (26 at first disease grade, 35 at secondary). 91 false referrals were identified (85 at first full disease grading). R1 (background retinopathy present) was falsely recorded on 173 first full disease and 28 second full disease grade encounters.

Data from Heart of Birmingham and Solihull optometrists compiled 1 month prior to and post additional grading training resulted in a 51% reduction in arbitration grading confirming improved grading accuracy at all levels.

Conclusion: Arbitration grading across both clinical outcome and grade is necessary as a valuable and robust method of ensuring accuracy and detection of retinopathy, ensuring safety and detection of sight-threatening retinopathy, whilst reducing unnecessary ophthalmology referrals.