ABCD
Spring Meeting
St John's Hotel, Solihull
18th & 19th April 2013

Association of British Clinical Diabetologists

POSTERS

1 Combined insulin and liraglutide therapy is associated with metabolic improvement and reduction in insulin dose in commonly prescribed insulin regimens: an ABCD liraglutide audit analysis

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Background: Liraglutide added to insulin is not licensed or supported by NICE.

Aims: To evaluate the efficacy and safety of liraglutide added to common insulin regimes.

Methods: Data was obtained from the ABCD nationwide audit of liraglutide in real-clinical use (2009-2013, n=5643). Descriptive statistics were performed, expressed as % frequency, mean±SD or median(IQR). Patients were categorised according to their insulin regime at liraglutide initiation: 0–none, 1-basal, 2-basal-bolus, 3-biphasic. Changes in HbA1c, BMI, weight and insulin dose at first return visit were calculated within and between groups (paired t-test, ANOVA).

Results: Of 5551 patients (53.8% males, 89.7% Caucasian, 55.5±11.0 years, diabetes duration 9.0(6.0-13.0) years, HbA1c 9.4±1.7%, BMI 38.8±7.3kg/m^2, weight 110.5±22.8kg), insulin was co-prescribed in 2102(37.9%) with 660(31.4%) on basal, 710(33.8%) on basal-bolus, 732(34.8%) on biphasic insulin regimes. There was a reduction in HbA1c (no insulin 9.3±1.7 to 8.3±1.7%; basal 9.3±1.6 to 8.5±1.7%; basal-bolus 9.6±1.6 to 8.8±1.7%; biphasic 9.3±1.8 to 8.5±1.7%), weight (no insulin 110.5±22.8 to 107.8±22.4kg; basal 108.9±21.4 to 106.1±20.9kg; basal-bolus 110.3±20.9 to 108.2±21.2kg; biphasic 111.5±24.1 to 108.6±23.5kg) and insulin dose (basal 60.0(30.0-116.0) to 46.0(4.0-93.5) units; basal-bolus 120.0(74.5-201.5) to 83.0(38.5-163.0) units; biphasic 90.0(56.0-136.0) to 66.0(0.0-99.5) units) in all groups (P<0.0001) with a median follow-up interval of 3.8(2.8-5.9) months. There was no difference in reported frequency of hypoglycaemia or in liraglutide cessation between the non-insulin and insulin groups.

Conclusion: Patients for whom liraglutide is added to insulin in any of the common insulin regimes show i) comparable improvement in metabolic parameters to those not on insulin; ii) considerable reduction in total daily insulin dose.

2 Risk of Obstructive Sleep Apnoea (OSA) is increased in type 1 diabetes (DMT1): Preliminary results from the Chronic Disease Research in Diabetes Study

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Introduction
The Chronic Disease Research in Diabetes Study commenced in November 2012. It aims to develop a database of clinical information paired with biological samples to explore the natural history of diabetes and its complications. Here we present early data on risk of OSA, depression, functional ability and eating behaviour in DMT1 and type 2 diabetes (DMT2).

Methods
Participants completed the following validated questionnaires at their baseline visit: STOP screening questionnaire for OSA, Patient Health Questionnaire (PHQ-9) for depression, Health Assessment Questionnaire (HAQ-DI) for functional ability, Three Factors Eating Questionnaire (TFEQ-R18) for eating behaviour. Anthropometric measurements including neck circumference were also collected.

Results
30 subjects have been recruited to date. 62% with DMT1 and 38% with DMT2. The STOP score for OSA was higher ($p=0.026$) for individuals with DMT2 than DMT1, with the overall risk being increased for both conditions. Neck circumference was positively correlated with the STOP risk scores for OSA ($p=0.047$). No significant difference between DMT1 and DMT2 existed for PHQ-9 depression scores ($p=0.072$), HAQ-DI functional ability scores ($p=0.113$) or any domains for TFEQ-R18 eating behaviour questionnaire: cognitive restraint ($p=0.730$), uncontrolled eating ($p=0.601$) and emotional eating ($p=0.797$).

Conclusions
We present preliminary data related to co-morbidities in individuals with diabetes. Early results suggest a yet unexplored risk of OSA in individuals with DMT1, and a trend towards increased risk of depression in DMT2 compared to DMT1.

3 An innovative mobile phone telehealth intervention to improve resource use in the management of gestational diabetes allows remote delivery of care and is well received by pregnant women.

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Introduction:
Widening of screening criteria, lowering diagnostic thresholds and underlying demographic changes threaten to overwhelm resource-limited services for women with gestational diabetes (GDM). We have developed a telehealth system (GDm-Health) with the aim of providing GDM care with fewer clinic visits, faster response and improved user satisfaction.

Aims:
This pilot study aimed to demonstrate the feasibility of GDm-Health, to assess glucose control and user satisfaction and to inform the design of a randomised comparison trial with standard care.

Methods:
Annotated pre- and post-meal blood glucose results are transferred in real-time from monitor (via Bluetooth) to smartphone to server. Results are presented in tables and graphs to users and healthcare professionals with target ranges highlighted. Diabetes specialist midwives review the automatically-prioritised data and advise on medication changes by text messages or phone calls.
Women with GDM presenting to two Oxfordshire hospitals were offered the technology. User satisfaction was assessed by questionnaire.

Results:
The technology was offered to 52 women and 50 were recruited, 18 with previous GDM and 32 with de novo OGTT-diagnosed GDM.

To date 36 women have delivered healthy babies. 14,297 blood glucose results have been transmitted, 98% tagged with prandiality and 17% with annotations on diet and other factors. 358 text messages were sent to users, including 90 medication adjustments. Of the 24 users returning questionnaires to date, 24 agreed that the system was convenient (21 strongly agreed).

Conclusions:
The GDm-Health system works well in clinical practice, allows remote delivery of care and is well received by users.

4 An Audit of Diabetes Inpatient Care in a NHS Foundation Trust

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We conducted four annual surveys (2009-2012) of inpatient diabetes care in our West Midlands NHS Trust. Prevalence of diabetes ranged from 17.8- 19.1% in our patients, four times the national average. The mean age of our patients ranged from 69-73 years: older than the trust mean of 64 years. Ethnic distribution was similar to that of the trust.

83-90% of our patients were admitted on an emergency basis. The mean length of stay in hospital fell each year, from 18.5 to 11.4 days, still comparatively longer than the trust length stay of 9.0 days. The proportion of these patients taking insulin increased from 28% to 45%, and only 4-10% could be managed with diet alone. These demands are reflected in the figures: patients being seen by DISNs increased from 7% to 25%.

Good glycaemic control was defined as CBG between 4.0-11.0mmol/L.Patients with an HbA1c.7.0% were more likely to have 7 days of good glycaemic control: the average patient managed 3-4 days. Hyperglycaemia was the most common problem, with 1 in 2 patients having at least one episode. Hypoglycaemia affected 40% in 2009 and this fell to 27% in 2012. Both events were common, with 3.8 hyperglycaemic events per week per patient, and 1.7 hypoglycaemic.

A notable progression is the near complete abolishment of prescription error, attributable to electronic prescribing. Previously, up to 27% (2010) patients had received a prescription in error, mostly mistimed administrations. Management errors however remain common: occurring in 27%, 25%, 35% and 32% each year, respectively. Most frequently, these result from the failure to increase or decrease medication despite persistent hyperglycaemia or hypoglycaemia.

5 A Hospital based Study of Type 2 Diabetes in Youth in Nottingham- Implications for future care

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Background
Type 2 diabetes (T2DM) in youth is increasing due to the growing epidemic of childhood obesity and is associated with increased morbidity and mortality.

Aim
To review the demography, management, and complications in patients < 25 years with T2DM currently managed in secondary care in Nottingham.
Data was collected from the hospital DIAMOND database.

Results
334 diabetes patients < 25 years were identified. 36 had T2DM (33% male: 67% female) and 67% were Caucasian, 31% Asian and 3% Afrocaribbean. Majority were under the adult services with 31% under paediatric care.

Mean age (range) at diagnosis was 16 yrs (11-24yrs) with the average duration of diabetes of 4 years (0-10yrs).
Mean HBA1c at diagnosis was 9.6% (6.1-14%) with a mean BMI of 34 kg/m2(24-58). 35% were severely obese (BM1 >35Kg/m2).
16% achieved HBA1c < 6% with lifestyle and Metformin. 56% had HbA1c > 7.5% with 37% requiring insulin.
In terms of complications, 17% had retinopathy, 39% none and 44% defaulted screening. 1 patient developed Nephrotic Syndrome due to morbid obesity and 1 had evidence of Microalbuminuria. Significant Hyperlipidemia was present in 11% and 8% were suffering from depression.

Conclusion
Complications can present early in youth with faster progression than those with Type 1 diabetes. There is a clear need to review the provision of care for this cohort who often require a more aggressive approach to treatment than those who develop T2DM later on. We recommend an integrated multidisciplinary team approach with clear guidelines to meet their clinical goals.

6 Virtual Consultation? An innovative way for Diabetes Education

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In England the prevalence of diabetes was 3 million in 2011 which is predicted to increase to 4.6 million in 2030. The development of diabetes is preceded by impaired glucose regulation and metabolic abnormalities. The risk of development of complications secondary to diabetes is significantly enhanced due to lack of self awareness. The National diabetes audit in 2012 highlights an important issue that 17% of type 1diabetes patients have high risk glucose control.

Clinical teams are constantly looking to improve diabetes care in certain group of patients. Safe hospital discharge is not effectively achieved in all the hospital situations due to multiple limiting factors in patients with new diagnosis of diabetes. One of the major limiting factors is the lack of appropriate diabetes education. It has to be balanced against the pressures of an early safe discharge while these patients wait for a diabetes specialist nurse consultation on the wards.

We have produced an online diabetes education video with collaboration of Diabetes Team, Dietician, Hounslow Voluntary group, Communications team and Leadership team for West Middlesex University Hospital inpatients and outpatients.

http://www.youtube.com/user/WestMidHospital

Alternative Diabetes Education Pathway for newly diagnosed diabetes patients
Staff Satisfaction Survey Results

A staff satisfaction survey of 15 staff members was conducted at West Middlesex University Hospital via survey monkey website. The collected responses showed the following results

1. Only 33.3 % patients were asked for appropriate diabetes education after the new diagnosis of diabetes by the clinical staff.
2. All members felt that an available resource during 5 pm-9 am and weekend would be a useful for discharge of newly diagnosed diabetes patients.
3. All staff members felt that they would be more satisfied to achieve a safe discharge with use of the current diabetes education video.

7 Retinal emboli are a poor prognostic indicator in people with diabetes.

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Purpose:
To examine prognosis and prognostic indicators in diabetic patients with retinal emboli compared to diabetic patients of the same age with no retinal emboli.

Methods:
Retrospective case control study of all 133 diabetic patients who attended the annual Diabetic Eye Screening Programme (DESP) from 2008 to 2012, and identified as having retinal emboli from fundus images, against 133 diabetic control patients without evidence of emboli, screened on the same day with the nearest age to the cases. Variables studied included HbA1C, creatinine, lipid profile, mortality, and grades of diabetic retinopathy and maculopathy.

Data was obtained from the eye-screening database of all diabetic patients attending the Shropshire DESP. Mortality assessed as of December 2012.

Statistical analysis was assessed using Fishers exact 2-tailed test and Paired t-test.

Results:
• Average age (years): cases-72.50 & controls-72.71, p-value-0.88

• Mortality: cases-27 & controls-13, p-value 0.025(statistically significant)

• Average HbA1c mmol/mol: cases-57.83 & controls-55.91, p-value 0.33

• Average creatinine Umol/L: cases-108.59 & controls-87.23, p-value 0.00 (statistically significant)

• Average HDL mmol/L: cases-1.24 & controls-1.32, p-value 0.07

Conclusions:
Despite similar age and duration of known diabetes, those with retinal emboli had twice the mortality thus reaching statistical significance. Interestingly, renal function was worse in patients with retinal emboli presumably due to reno-vascular disease. We therefore strongly believe that the presence of retinal emboli cannot be ignored in an eye-screening programme.

It is logical to enhance focus on cardiovascular risk prevention in this very high-risk group of diabetic patients and ensure collaboration between ophthalmologists and physicians in managing these patients.

8 Management of cystic fibrosis related diabetes.

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Cystic fibrosis (CF) affects over 7500 people in the UK. The estimated rate of prevalence of CF related Diabetes (CFRD) is about 40 – 50% in adults. The only recommended treatment in CFRD is insulin. There is evidence that CF patients on insulin therapy who achieve glycaemic control demonstrate improvement in weight, pulmonary function, and survival.
We did retrospective analysis of notes of 35 patients with CFRD over a 3 year period attending Newcastle Diabetes Centre.
Results:
The mean age at diagnosis was 22.6 ± 9.1 years with all patients being Caucasians and consisted of 17 females and 18 males. 20 of these patients were already known to have CFRD while 7 were diagnosed with home glucose monitoring and 8 by OGTT. The indication of treatment in 32 was CFRD while in 3 patients, it was impaired OGTT with weight loss. The time lag between diagnosis and initiation of insulin ranged from 0 to 36 months with a median delay of 1 month. During the 3 year study period, the HbA1c improved from 7.6 ± 1.8% to 7.2 ± 1.2%. The mean weight improved from 57.2 ± 9.4 Kg to 61.8 ± 11 Kg. The FEV1 and FVC

improved from 64.9 ± 29.8% and 75.4 ± 23.9% at the beginning to 66.8 ± 28.4% and 84.6 ± 21.5% respectively.

These results show the importance of achieving good glycaemic control in CFRD as it leads to stabilization of their weight and pulmonary functions.

9 Paediatric Insulin Pump Service in East and North Hertfordshire NHS Trust: Short-term and long-term outcome.

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Background: The audit included all 38 patients treated in the Trust between 2002 and 2011. 33 had failed MDI (26 with recurrent hypos); 4 achieved target HbA1c but had recurrent hypos and MDI was inappropriate in one patient. Pump education was offered on one-to-one basis to patients and/or parents.

Results: The median HbA1c dropped from 8.8% (range, 6.2 - 11.7%) to 8% at 7 (4-10) months and 8.65% at 27 (11-105) months but increased to 8.9% at 48 (4-124) months post-SCII. Hypoglycaemic awareness improved in 9 of the 17 patients with absent (n=6), reduced (n=9) or modified (n=2) hypoglycaemic awareness pre-SCII. Hypoglycaemia improved in 13 and hypoglycaemic awareness improved in 3 of the 17 patients whose HbA1c dropped by >0.5%. Of the 19 patients with worsening control (HbA1c increased by >0.5%), 16 had improved hypoglycaemia and 6 had improved hypoglycaemic awareness. HbA1c did not change in 11 patients. Overall, where gaols for CSII have been agreed in advance, 85-90 % of patients achieved their agreed goals of reduced glycaemic fluctuations, reduced hypoglycaemia, reduced anxiety about hypoglycaemia, increased self-control, improved flexibility and QoL; any improvements in year one post-CSII were sustained in subsequent years. Post-CSII hypoglycaemic admissions, hypoglycaemia needing 3rd party assistance and hyperglycaemic admissions occurred in 2, 2, and 8 compared with 9, 10, and 10 patients pre-CSII, respectively.

Conclusions: Unlike in adults, improvement in HbA1c with pump therapy in children is not sustained in the long-term and achieving HbA1c target in unusual. However, improvements in QoL, hypoglycaemia, hypoglycaemic awareness and hypoglycaemic admissions are significant and sustained.

10 Diagnosis of gestational diabetes.

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Current Nice guidelines suggest that women who are diagnosed with Gestational Diabetes should be offered lifestyle advice (including weight control, diet and exercise) and offered a fasting plasma glucose measurement (but not an OGTT) at the 6-week postnatal check and annually thereafter. Several studies show that this statement might not be right. A total of 74 women with Gestational Diabetes were delivered at the Darlington Memorial Hospital from Jan 2010 to Dec 2011. All of them were recommended to have 6 weeks post natal OGTT as per local protocol. The results of OGTT were analysed retrospectively according to WHO criteria. 59 patients had OGTT while 15 patients did not attend the test. Out of 59 who attended the test, 53 (89.83%) had normal OGTT, two (3.39%) were diabetic (7.8/11.4, 5.1/13.9)), two (3.39%) with impaired fasting glycaemia (6.7and 6.8) and two (3.89%) had impaired glucose tolerance (7.2 and 8.7). If we strictly follow the NICE recommendations, we will miss one (1.69%) diabetic (5.1/13.9) and two (3.39%) cases of IGT. The data shows that significant number of diabetic patients will be missed if fasting glucose only is used at six weeks postnatal. Considering the above evidence standard 2 hours glucose tolerance test should be considered in every gestational diabetic at six weeks post natal.

11 Sitagliptin impairs healing of experimentally induced gastric ulcer through inhibition of iNOS and COX-2

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Background and purpose
Gastric ulcer healing is a complex process that is regulated by several promoting factors including cyclooxygenase-2 (COX-2) and inducible nitric oxide synthase (iNOS). Diabetes mellitus may be associated with delayed ulcer healing. Hence, the purpose of the current study was to investigate the effect of Sitagliptin (dipeptidyl peptidase inhibitor IV) on gastric ulcer healing and expression of iNOS and COX-2 in rat stomach.

Design and method
The study was conducted on 30 rats divided into three equal groups. Group 1 served as normal control group. Gastric ulcer was induced in group 2 (ulcer model group) and group 3 (Sitagliptin-treated group) by serosal application of acetic acid. Three days after ulcer induction, sitagliptin at a dose of 30 mg/kg/day was given orally for seven days to rats in group 3. Rats were sacrificed ten days after ulcer induction and stomach was removed for histopathological examination and Immunohistochemical evaluation of COX-2 and iNOS.

Results
This study revealed that gastric ulcer healing was significantly impaired in the sitagliptin-treated group evidenced by histopathological examination of stomach showing significantly larger ulcerated area and ulcer base maturation impairment. COX-2 and iNOS expression in stomach as well as microvessel density (MVD) were significantly diminished in the sitagliptin-treated group as compared to ulcer model group. A significant positive correlation was found between COX-2 and iNOS implying their synergistic action.

Conclusions
Sitagliptin was found to significantly impair gastric ulcer healing. Thus, the use of sitagliptin, as anti-diabetic agent, in gastric ulcer patients should be discouraged.

12 Darlington Knowledge Audit: A new chart for DKA management

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The Joint British Diabetic Societies (JBDS) Guidance for the management of Diabetic Ketoacidosis (DKA) was published in 2011. In our trust, a new policy for the management of DKA has been implemented to reflect these guidelines. This audit was designed to assess how DKA was being managed based on the previous policy in order to establish factors that could be addressed to ease the transition to the new policy.

42 episodes of DKA were coded in July, August and September 2012. Of these, the notes for 20 of these episodes were available in the data collection period.

Out of the 20 episodes, 14(70%) were correctly diagnosed with DKA. The remaining 6(30%) were excluded from further analysis. The 14 episodes with DKA represented 11 patients (5 male, 6 female), all with Type 1 Diabetes Mellitus and with a mean age of 31.6 years.
From these 14 patients 12(86%) received appropriate fluid management, 10(71%) received appropriate IV insulin treatment, but only 6(43%) received appropriate potassium replacement. Monitoring was suboptimal in every case, but felt to be inappropriately poor in 9(64%) of cases. All patients were managed in an appropriate setting and precipitating illnesses were treated appropriately when they were identified.

A new protocol chart has been designed which combines the prescription of insulin, potassium and fluid on the same page as all the necessary monitoring, in an attempt improve the areas where management is deficient. Education sessions amongst the staff have been arranged to assist with the changes. A simulation training session on recognition and management of DKA is being developed for medical

student/junior doctor teaching. A DKA 'flow-chart' as part local guidance on common acute medical problems is also being developed.

Re-audit to assess any early problems with the new policy is planned in summer 2013. A further re-audit is planned in 2014.

13 Adult Insulin Pump Service in East and North Herts NHS Trust: A detailed 5-year evaluation

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Background: Insulin pump services for adults commenced in 2006. Of 63 patients referred for assessment, 24 were declined and 39 were approved, of whom 34 had completed at least 4 months of pump therapy and were included in the audit between June 2006 and November 2011. 32/34 patients had received in-house structured education before referral for assessment.

Results: Patients had basal HbA1c of 5.5-13% (median 8.3%); 28 patients had recurrent hypoglycaemia, and 24 had reduced and/or modified hypoglycaemic awareness. The mean HbA1c dropped from 8.5% to 7.5% at 8 (4-10) months post-CSII; longer term the mean HbA1c in a subgroup of 26 patients fell from 8.3% to 7.3% both at 6 months and at 18 (8-56) months post-SCII. Total insulin dose showed a sustained drop of more than 30%. Two patients had HbA1c <7% pre-SCII compared with 14 and 10 patients at 8 (4-10) and 18 (8-56) months post-SCII, respectively. Sustained improvement in hypoglycaemia, reduced BG excursions and/or improved hypoglycaemic awareness are seen in 60% of patients. These improvements were independent of changes in glycaemic control. Subjective improvement in QoL was reported in more than 90% of patients with more convenience, self-control, and flexibility and less anxiety about hypoglycaemia. The average change in weight was -0.6kg in responders (HbA1c drop >0.5%) and +1.2kg in non-responders (HbA1c drop <0.5%). Pump discontinuation was declined by all 7 patients who hadn't had improvement in HbA1c or hypoglycaemia; however, 5 of them achieved improvement after 6 months.

Conclusions: Sustained quantitative and qualitative improvements are achieved in glycaemic control and/or hypoglycaemia in 80% of patients carefully selected for SCII with subjective improvement in QoL in most patients.

14 Improving Foot Health within South London Healthcare Trust

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At Queen Elizabeth Hospital, Woolwich over 95% of medical patients are admitted via the AMU. Nationally around 20% of in-patients have diabetes and almost 25% of patients have not had an annual foot check. Therefore this in-patient episode is an opportunity to improve foot health in this 'lost' population.
An initial audit of all medical in-patients during July 2012, using the NICE CG119 audit tool, identified shortcomings within our hospital. With these identified, we concentrated our resources on patients admitted via AMU, to increase diabetic foot examination.
We ran teaching sessions for all junior doctors and consultants working on AMU. Educational sessions were repeated roughly every 4 months, to capture all junior doctors.
Alongside the educational program, we designed 2 memory prompts and decision aids, to ensure that diabetic feet were being examined on admission and subsequently throughout in-patient stay. They outlined the signs of 'at risk' feet and active foot disease, with prompts to refer to the MDT and consider pressure-relieving products etc. (image). Recognising doctors' love of acronyms, we adapted 'PEDIS' score to that of 'PODIS' to incorporate non-ulcerated feet, in the hope that this aid-memoire would increase compliance further. These were initially used as posters in the AMU and a snap-shot review showed an improvement. However, we were still not achieving 100% compliance with NICE standards so these have

since been added to the AMU clerking booklet, used by all junior doctors, and a repeat survey will be carried out next month.

LATE BREAKING ABSTRACT

15. Liraglutide and acute pancreatitis in the Association of British Clinical Diabetologists (ABCD) nationwide liraglutide audit

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Introduction: There is concern that glucagon like peptide-1(GLP1) therapies may be associated with acute pancreatitis. The data from the ABCD nationwide liraglutide audit (March 2013=5948 patients, 89 centres) provides an opportunity to assess the extent of the problem in real clinical practice.

Methods: At every visit audit-contributors were invited to submit data on possible side effects. Reported cases of 'possible pancreatitis' were identified and the centres concerned were contacted to obtain full details.

Results: The patients in the audit had worse glycaemic control and were much heavier (mean±SD HbA1c 9.4±1.7%; BMI 38.8±7.3kg/m^2) than in combined clinical trials of liraglutide (mean HbA1c 8.5%, BMI 31 kg/m^2). There were four cases of possible acute pancreatitis, but three of these had likely alternative explanations (gall bladder disease, pre-existing pancreatitis, acute abdominal illness of uncertain cause). To date the audit has monitored 3713 years of exposure to liraglutide. The sole case of acute pancreatitis with no other causes for pancreatitis found,represents an incidence of 0.027/100 patient years of exposure to liraglutide.

Conclusion: In cases of acute pancreatitis on liraglutide, if another cause can be found, the drug is not necessarily culpable. The incidence of unexplained pancreatitis was low. In practice many acute pancreatitis cases are idiopathic reducing further the need to implicate liraglutide. Considering the benefits in terms of weight loss, improved glycaemic control and reduction in other diabetes therapies, including insulin, the possibility of pancreatitis in real clinical practice seems to represent a very small risk in comparison to the potential benefit gained.