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Abstract ID: 445

Cutaneous diphtheria causing diabetic foot ulcer infection:
 A case report

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Background: Cutaneous diphtheria is rare in England due to the success of the routine immunisation programme. Here we describe an unusual case of diabetic wound infection with toxigenic *Corynebacterium ulcerans*.

Case report: A 62-year-old male was referred to the acute multidisciplinary diabetes foot clinic. He had a history of type 2 diabetes complicated by retinopathy and neuropathy (contemporary HbA_{1c} 63 mmol/mol). Following minor trauma, he had developed a left hallux ulcer with indurated edges; it was clinically infected with localised cellulitis over the dorsum. He remained systemically well. Pedal pulses were intact aside from a monophasic left posterior tibial. Bloods revealed white cell count (WCC) 12.9 and C-reactive protein (CRP) 17.2. X-rays demonstrated bone resorption and destruction of the distal phalanx of the left hallux, due to active osteomyelitis. Ulcer tissue culture showed growth of *Staphylococcus aureus*, Group A *Streptococcus*, and a toxigenic strain (diphtheria toxin) of *Corynebacterium ulcerans*. Nose and throat swabs at the regional infectious diseases unit were negative. Interestingly, he had visited Barcelona shortly before presentation, and he kept pet dogs – one of which was also positive for toxigenic *C. ulcerans* on swabbing. Despite six weeks of oral co-amoxiclav and clarithromycin, wound healing was slow with ongoing infection. Serial podiatry tissue culture revealed heavy growths of *C. ulcerans*. Public Health England recommended that both the patient and his household contacts receive further treatment with oral erythromycin, but not diphtheria antitoxin.

Conclusion: Early manifestations of cutaneous diphtheria can appear as non-healing, well demarcated diabetic foot ulcers. Careful history taking, including foreign travel and companion animals, is essential.

Abstract ID: 408

In people with suspected type 1 diabetes or rapid progression to insulin, presence of a single positive islet autoantibody confirms the genetic characteristics and progression of classical type 1 diabetes

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Aim: New EASD/ADA guidelines recommend testing for islet autoantibodies in all those people with clinically suspected adult-onset type 1 diabetes, including those diagnosed with type 2 diabetes rapidly progressing to insulin. We assessed whether a single positive islet autoantibody confirmed the genetic and progression characteristics of type 1 diabetes in this clinical setting.

Methods: In 1,814 participants with newly diagnosed adult-onset diabetes we compared the type 1 diabetes genetic risk score (T1DGRS) and rate of loss of beta cell function (annual urine C-peptide creatinine ratio [UCPCR], over median two years) between definite type 1 diabetes, defined as a clinical diagnosis of type 1 diabetes and ≥ 2 positive

islet-autoantibodies (of GAD, IA2, Znt8, n=305) and the following groups: group 1) single antibody-positive and clinical diagnosis of type 1 diabetes or uncertain and initially treated with insulin (n=199); group 2) single antibody-positive rapidly progressing to insulin (n=36).

Results: Participants with a single positive autoantibody and early insulin treatment had genetic susceptibility consistent with type 1 diabetes. T1DGRS was 0.268 (95% CI 0.264-0.272) and 0.267 (0.258-0.276) for single antibody-positive participants in groups 1 and 2 respectively, 0.264 (0.261-0.267) in multi-antibody positive type 1 diabetes, and 0.231 (0.228-0.233) in autoantibody-negative type 2 diabetes. These participants also had a rapid loss of C-peptide: annual change in UCPCR -38% (-30,-45) and -25% (-8,-39) in groups 1 and 2 respectively, in comparison to -38% (-31,-44) in multi-antibody positive type 1 diabetes, and -6% (-1,-10) in antibody-negative type 2 diabetes.

Conclusion: In people with suspected type 1 diabetes or with rapid progression to insulin, a single positive islet autoantibody confirms the genetic characteristics and progression of classical type 1 diabetes.

Abstract ID: 428

Ethnic disparities in medication adherence? A systematic review examining the association between ethnicity and antidiabetic medication adherence

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Objectives: Adherence to prescribed medication is an essential component of diabetes management to obtain optimal outcomes. Understanding the relationship between medication adherence and ethnicity is key to optimising treatment for all people with different chronic illnesses, including those with diabetes. The aim of this review was to examine whether the adherence to antidiabetic medications differed by ethnicity among people with diabetes.

Methods: A systematic review of studies reporting adherence to antidiabetic medication among people from different ethnic groups was conducted. MEDLINE, Embase, CINAHL and PsycINFO were searched from their inception to June 2022 for quantitative studies, with a specific focus on studies assessing adherence to antidiabetic medications (PROSPERO: CRD42021278392). The Joanna Briggs Institute critical appraisal checklist and a second checklist designed for studies using retrospective databases were used to assess study quality. A narrative synthesis approach was used to summarize the results based on the medication adherence measures.

Results: Of 17,410 citations screened, 41 studies that included observational retrospective database research and cross-sectional studies were selected, each of which involved diverse ethnic groups from different settings. This review identified a difference in the adherence to antidiabetic medications by ethnicity in 38 studies, despite adjustment for several confounding variables that might otherwise explain these differences.

Conclusion: This review revealed that adherence to antidiabetic medication differed by ethnicity. Further research is needed to explore the ethnicity-related factors that may provide an explanation for these disparities.

Abstract ID: 444**A digital approach to diabetes education, including needs-based triage and optional App coaching, achieves good completion rates and weight loss***Finnie J, Gupta N, Miller K, Diamond L, Schirmann F*

This work was carried out within Oviva UK

Background: Completion of diabetes structured education (DSE) has historically been low, with only 5.6% of participants attending within 12 months of diagnosis in 2020. Digital DSE has the potential to increase uptake. Here we present outcomes of a remote DSE service.

Method: 2,578 participants were triaged to three levels of care based on need, including self-efficacy, knowledge and emotional eating. Coaching frequency differed per level (1 = least frequent coaching, 3 = most frequent coaching). Participants accessed 12 weeks of DSE, personalised nutritional advice and behaviour change support from a specialist coach via a choice of App or phone coaching.

Results: 56.6% of participants (n=1,459, 50% male, 50% female) completed the 12 weeks of DSE. Completion at levels 1 to 3 was 64.9%, 64.4% and 41.3%, respectively; 57.8% of App and 55.2% of phone participants completed DSE.

Weight data were available for 490 participants. Of these patients, 81% lost weight. Average weight loss was 3.7kg (3.8%). At levels 1, 2 and 3 average weight loss was 3.9%, 4.1% and 3.5%, respectively. Average weight loss was 4.9% (n=230) in App and 2.9% in phone (n=260) pathways.

The 86.1% of participants for whom data were available (n=101) reduced their HbA_{1c} (14mmol/mol average reduction).

Conclusions: A digital/remote pathway achieved completion rates above the national average, indicating potentially increased uptake of DSE. App coaching was a clinically effective approach to DSE provision. The use of triage to determine intensity of coaching, tested here, potentially offers a means to optimise value (outcomes/cost) of DSE.

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Abstract ID: 441**Multisystem presentation of severe hypothyroidism***McNabb BM, Harper R, Shahzad MA, McHenry CM*

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Severe untreated hypothyroidism leads to chronic alterations in physiological mechanisms. Abnormalities in blood line, renal function and liver enzymes are described in myxoedema but our review, to date, has found no report of all three occurring simultaneously. We present a patient who was referred to nephrology, haematology and hepatology with renal impairment, cytopenia and abnormal liver enzymes, respectively, in whom no unifying diagnosis was reached until thyroid tests (TFT) were checked at the end of a complex investigation pathway.

This 29-year-old male presented to his GP with tiredness and leg swelling: his creatinine level was 157µmol/L (eGFR 45mL/min). He was referred to nephrology: no proteinuria was detected and ultrasound showed structurally normal kidneys. There was mild anaemia (Hb 100-110g/L), neutropenia (1.2-1.9x10⁹/L) and elevation of transaminases (AST 170:ALT 107U/L). Bone marrow was hypocellular with islands of normal cellularity; cytogenetics were normal. Liver screen was negative and biopsy showed steatosis, haemosiderosis and ground glass change similar to that seen in inherited metabolic disorders. A small pericardial effusion was demonstrated on CT chest/abdomen/pelvis but radiolog-

ical tests were otherwise unremarkable.

His TFT were checked 18 months following presentation: they showed free T4 <1.3pmol/L and TSH 333mU/L (anti-TPO antibodies positive [69IU/mL]). Levothyroxine 125mcg once daily was commenced. At two months his symptoms settled, with normalisation of TFT corresponding to complete resolution of renal impairment and raised transaminase levels. At six months, the haematological abnormalities also returned to normal.

We describe three unusual complications of severe hypothyroidism, with complete recovery of abnormalities following six months of thyroxine replacement. This highlights the importance of checking TFT in patients with unexplained renal impairment, anaemia/cytopenia or liver abnormalities

Abstract ID: 440**Current trends of diabetic ketoacidosis admission in adults with type 1 diabetes in Wales***Ndlovu PC,¹ Atkinson M,² Min T,³*

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Objectives: This retrospective cohort analysis study examined the current trend of hospital admission for diabetic ketoacidosis (DKA) in adults with type 1 diabetes (T1DM) in Wales.

Methods: All admissions for DKA in adults with T1DM aged ≥18 years between January to December 2021 were identified from the Secure Anonymised Information Linkage (SAIL) databank. We examined the length of stay (LOS) for each DKA episode. We also examined the number of patients who had DKA admission as per the Welsh Index of Multiple Deprivation (WIMD): score 1 describes the most deprived area and score 5 the least deprived area.

Results: 967 episodes of DKA admission were identified. After data cleaning, 630 DKA episodes in 436 patients (51.1% male) were included in the data analysis. Of 436 patients, 50% of DKA admissions were observed in patients aged between 25 and 49 years and 25% in those who were 18 to 24 years old. Ninety patients (20.6%) experienced more than one episode of DKA. Of 630 DKA admissions, 78.2% were admitted via A and E and 9.7% via the GP. The median LOS was 2 days (51.6% had LOS between 0 to 2 days). Of 421 patients with WIMD data, 29.5% and 27.3% were from WIMD score 1 and 2 areas, respectively. Only 7.6% of patients were from the least deprived area.

Conclusion: DKA admission was common in young and middle-aged adults. Recurrent DKA episodes were not uncommon. The most deprived quartile of WIMD areas had the greatest proportion of patients with DKA.

Abstract ID: 436**A case report on the metabolic effects of a very low carbohydrate diet in a patient with HNF1A MODY***Sheikh A, Nasir S, Flanagan C, Sibal L*

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Introduction: Obesity and diabetes are the greatest long-term health challenges and are indeed a global pandemic.¹ Various strategies have been developed to manage the burden of obesity and overweight in individuals with diabetes. Weight loss diets have been one of the most popular strategies in the last few decades, especially in people with diabetes. Although weight loss diets and calorie restriction can modify the metabolic abnormalities associated with diabetes by improving the

body weight and overall glycaemic control, a diet very low in carbohydrates (CHO) may lead to derangements in lipid profile with a concomitant increase in cardiovascular risk.²

Case report: We report a 33-year-old male who was initially given the diagnosis of Type 2 diabetes after presenting with osmotic symptoms. He had high blood glucose and an HbA_{1c} of 73 mmol/mol on presentation, with no ketosis and negative GAD and islet cell antibodies. After diagnosis he stayed on a very-low-carbohydrate ketogenic diet (VLCKD) to achieve diabetes remission. He was subsequently diagnosed with Maturity Onset Diabetes of the Young (MODY) based on genetic testing, which showed a gene alteration in HNF1A. Although his glycaemic control improved remarkably on the VLCKD, his lipid profile showed a significant deterioration and accelerated his 'heart age' by two years (JBS3 heart age tool).³

Due to concerns around the sustainability and the adverse effects of this degree of CHO restriction on the patient's cardiovascular profile, he gradually reintroduced CHO and this led to reversal of the dyslipidaemia.

Conclusion: In general, most low carbohydrate diets allow approximately 20 to 60 grams/d of CHO (<20% of total daily calorie intake), and VLCKDs typically restrict CHO to less than 20 grams/d. Our patient was on <5 grams of CHO per day. This case highlights the effects of variations in dietary CHO and fat intake on various aspects of carbohydrate and lipid metabolism in patients with MODY.

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Abstract ID: 413

A pragmatic health informatics systems approach for aiding clinical prioritisation in a hospital-based cohort of 4013 people with diabetes

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Background: There is a need for data-driven approaches to facilitate risk stratification and clinical prioritisation in diabetes services.

Aim: To develop a pragmatic informatics-based approach to guide clinicians to prioritise those at highest risk/need.

Methods: We identified modifiable risk criteria in 4,013 adult people (48% female) with diabetes (type 1 diabetes 20%) attending clinics in a teaching hospital. The six risk criteria agreed by a panel of specialists were new events/results occurring after their last diabetes clinic visit.

1. Diabetes-related emergency department visit/hospitalisation; 2. HbA_{1c} >96 mmol/mol; 3. HbA_{1c} rise >20 mmol/mol; 4. estimated GFR <30 ml/min; 5. eGFR fall >15 ml/min/year; 6. Treatment for eye disease (e.g. photocoagulation). People with one or more criteria were defined as 'higher-risk'. Those who did not have any new risks, with encouraging HbA_{1c} and eGFR data/trends, were categorised as 'lower-risk'. We documented upcoming appointment dates to enable clinicians to decide whether, given their 'risk' status, people could be seen sooner or later than originally intended.

Results: Of the 4,013 people, 656 (16.3%) had one or more higher-risk criteria. People with higher-risk criteria were more likely to be non-Caucasian and had greater deprivation. Of these 'higher-risk' people 248 (6.2%) did not have an appointment within three months of the review. Similarly, 364 people (9.1%) had 'lower risk' and of these 174 (4.3%) were due to be seen within three months. They might be considered for rescheduling to enable those at higher risk to be prioritised. The remainder of the cohort (2,993 people, 74.6%) did not have any new risk data and were therefore not scored.

Conclusion: A pragmatic data-driven method is helpful in identifying those people with diabetes who are at highest need for clinical prioritisation.

Abstract ID: 426

Uptake and retention in a digital low-calorie diet (LCD) programme delivered to an ethnically diverse population living with type 2 diabetes: an interim analysis

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Oviva

Introduction: Low-calorie diets (LCD), delivered through face-to-face appointments, can achieve significant weight loss and 46% remission rates at one year.¹ This is possible in people with a mixed ethnic background too.² Diabetes prevalence in this population is high; accordingly, ensuring that interventions are scalable and accessible is key.

Here we evaluate the retention and clinical effectiveness of a digital LCD programme for ethnically diverse adults with type 2 diabetes (T2DM) who do not require face-to-face appointments.

Methods: Preliminary data from 37 adults with T2DM (with 26 [70%] classifying themselves as non-Caucasian), following a digital LCD programme (12-week total diet replacement [TDR] approximately 800 calories; four weeks food reintroduction; eight months behaviour change support) were collected and analysed to determine retention and engagement for the first six months of the programme. Patients had access to a smartphone App for self-monitoring and coach support.

Results: 30 (81%) patients completed the 12-week TDR phase and 27 (90%) completed six months. Average weight loss at week 12 was 10.9kg (n=30) and at six months was 11kg (n=27). The service is still live but for those who have reached 12 months, average weight loss is 11.5kg (n=11). 78 prescriptions were stopped, with an average of 2.2 prescriptions stopped per patient. The average reduction in HbA_{1c} at six months was 10.9 mmol/mol (n=11).

Conclusion: Preliminary data demonstrate that a digital LCD programme results in significant weight loss, glycaemic improvement and medication reductions at six months in an ethnically diverse adult population with T2DM, accompanied by high engagement and retention.

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Abstract ID: 422

Anxiety and depression among adult patients with diabetic foot ulcer attending a multidisciplinary foot clinic

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Aim: Diabetic foot ulcers (DFU) are linked to morbidity, decreased mobility, and feelings of isolation, powerlessness and sadness. The aim of this study was to explore the prevalence of anxiety and depression symptoms in adult patients with DFU.

Method: Patients with DFU attending our multidisciplinary diabetic foot clinic from February 14th to March 14th, 2022 were invited to complete a questionnaire which included sociodemographic questions, the Patient Health Questionnaire-9 (PHQ-9) scale to assess depression and the Generalized Anxiety Disorder scale (GAD-7) to assess anxiety. For each scale, a cut-off total score of 10 was used to identify those who met the criteria for anxiety and depression.

Results: 60 patients completed the questionnaire. 83.25% of the participants reported that their diabetes foot care had not been affected by the COVID-19 pandemic. 25% reported moderate to severe anxiety symptoms, 10% reported mild anxiety symptoms while 65% reported no or minimal anxiety symptoms. Regarding depression, 30% reported moderate to severe depressive symptoms, 10% reported mild depressive symptoms, while 60% reported no or minimal depression (Figure 1). Patients with other co-morbidities were three times more likely to report depression compared to those without other co-morbidities (OR=3.2; 95% CI 1.10-10.26). Patients younger than 50 years were nearly nine times more likely to report anxiety compared to those aged 60 years or above (adjusted OR=8.9; 95% CI: 1.01-86.41) taking into account other variables.

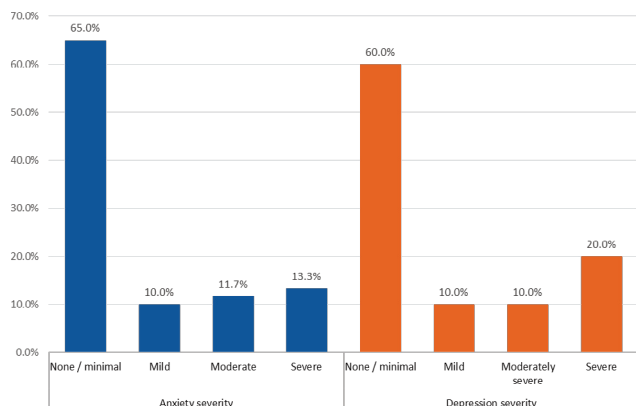


Figure 1. Psychological health in the cohort of patients

Conclusion: The prevalence of depression and anxiety in this cohort of patients with DFU was low, but the severity was moderate to severe in those who were affected. Patients with other co-morbidities and those younger than 50 years have worse mental health status. This finding needs to be taken into account in the management of patients with DFU. Attempts to reduce anxiety and/or depression could improve the quality of life of DFU patients.

Abstract ID: 405

Revisiting the “type of diabetes” in genetically susceptible patients

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Introduction: Maturity Onset Diabetes of the Young (MODY), an autosomal condition accounting for 1-2% of all diabetes,¹ usually presents in the second to fourth decade. There are various subtypes of MODY, with HNF1 alpha (MODY 3) being the most common (30-70%).^{1,2}

Case Report: A middle-aged female, initially diagnosed as type 1 diabetes in 1991 during her early teens due to osmotic symptoms and BMI of 19kg/m² (when diabetes autoantibodies testing and genetic analysis for MODY were not available) was treated with a basal bolus insulin regime. She required only 16 units total daily dose for tight glycaemic control (HbA_{1c} between 2.5 – 4.5%) and had intermittent hypoglycaemic episodes for 14 years. Given her strong family history of insulin-dependent diabetes at an early age (in her mother and grandmother, who were later genetically confirmed to have MODY3), she was genetically screened for MODY in 2006 and confirmed to have MODY3. Therefore her insulin was stopped and she was started initially on metformin followed by gliclazide, which resulted in excellent glycaemic control without hypoglycaemic episodes and better quality of life (QoL). She has remained stable on oral diabetic medications for more than 15 years without any complications.

Learning points:

- More than two thirds of cases of MODY are initially misdiagnosed as either Type 1 or Type 2 DM
- Revisiting the type of diabetes in patient with a strong family history of diabetes can save patients from unnecessary insulin treatment, hypoglycaemic episodes, and social, financial, professional and insurance implications besides improving QoL
- This will also reduce the burden on health resources due to reduced screening and follow-up appointments

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Abstract ID: 412

The characteristics of lean diabetes in a multi-ethnic urban population

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Background: Increasing rates of type 2 diabetes (T2DM) in the young have traditionally been associated with overweight and obesity. However, young-onset T2DM with low-to-normal BMI has been less well studied. We aimed to compare characteristics of lean and non-lean youth with T2DM.

Methods: This was a retrospective cross-sectional analysis of individuals between the ages of 18-30 years with a diagnosis of T2DM in an urban inner-city district.

Results: 61 patients were included in the study. They were aged 20.3±3.7 years, with 90.1% of non-white ethnicity and HbA_{1c} at diagnosis of 82.2 ±25.8mmol/mol. 13% had a BMI <25.0kg/m². The lean vs non-lean group (BMI 22.1± 2.1 vs 34.6 ±6.6 kg/m²) was found to be more likely to have proteinuria at the time of diagnosis (RR=9.00,

$p=0.0025$), and had a lesser reduction in HbA_{1c} with treatment (1.3 ± 18.6 vs 19.9 ± 26.3 mmol/mol, $p=0.043$) despite no significant difference in treatment duration, blood pressure, HbA_{1c} at diagnosis or likelihood of insulin requirement. There was no significant difference in terms of retinopathy, dyslipidaemia, ketosis or gender distribution between the two groups.

Conclusion: T2DM has been studied extensively in the overweight population but the low-to-normal weight group poses a unique challenge in terms of pathophysiology, treatment response and complications. In young onset T2DM, lean individuals may be more likely to have proteinuria and inadequate treatment response. Further investigation may help us tailor interventions to optimise outcomes in this high-risk group.

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Abstract ID: 438

Burden of hypoglycaemia in people with diabetes on peritoneal dialysis

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The management of glycaemic control in people with diabetes on peritoneal dialysis (PD) can be challenging. The aim of this study was to report the prevalence and impaired awareness of hypoglycaemia in people with diabetes on PD.

Methods: Across three large hospitals, we examined the individual case notes of patients with diabetes who received peritoneal dialysis between December 2021 and January 2022.

Results: In total 64 people with diabetes (22% with Type 1 Diabetes) on PD (median age 63 years) were evaluated. The median duration of diabetes was 20 years. Median duration of peritoneal dialysis was 22 months. All participants except one were on glucose-containing dialysis regimes. Forty four people (70%) were on insulin. In total, 58% had an HbA_{1c} <58mmol/mol, of whom 66% were on medication that could be associated with hypoglycaemia.

Using Clark Score criteria, 13% of our cohort (including four people with type 1 diabetes) had hypoglycaemia unawareness. Similarly, 15% had Gold score of 4 or greater, indicative of impaired awareness of hypoglycaemia. Self-reported hypoglycaemic events (at least one event per month) were reported by 21% of individuals. Seven of 44 people on insulin utilised intermittent glucose monitoring systems.

Conclusion: We observed that approximately 15% of people with diabetes on PD had impaired awareness of hypoglycaemia. 58% had an HbA_{1c} <58mmol/mol, of whom two thirds were on treatments that could cause hypoglycaemia. The use of technology to aid diabetes care was low. Our results highlights the need for greater interdisciplinary working to help improve diabetes care in this high-risk group.

Abstract ID: 442

UK time and motion study of initiating tubeless and tubed insulin pumps

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Aim: To compare the time required for initiation with a tubeless insulin pump (a Pod) versus other pump types.

Methods: A self-reported Time and Motion study was conducted using a web-based tool to measure time taken by diabetes specialist nurses in the UK to initiate tubeless insulin pumps (Omnipod System or Omnipod DASH System) and tubed insulin pumps (excluding automated insulin delivery systems). Pump users were adults with and without prior experience of insulin pump therapy, and initiations were conducted face-to-face and remotely.

Results: The average time for initiating Insulin Pump Therapy (IPT) (176 diaries completed, 76 tubeless pumps, 48 nurses, 90% type 1 diabetes) was 109 minutes (range 7 – 421 minutes). The average time for initiating tubeless IPT was 15 minutes shorter compared to tubed IPT (mean \pm SD 100 ± 73 min vs. 115 ± 83 min, $p<0.05$). Initiations for tubeless IPT were significantly shorter for MDI users (mean time difference 17 minutes, $p<0.05$) across all settings, but not when users had prior experience of pumps (mean time difference 10 minutes, $p>0.05$). Tubeless pump initiations were 20 minutes shorter than tubed pump initiations in the face-to-face setting ($p<0.05$) but not significantly shorter in remote settings (3 minutes less on average, $p>0.05$).

Conclusion: This novel time and motion study identified significant time reductions for initiating tubeless IPT compared to tubed IPT. Applying this time saving across pump services could increase efficiencies for initiating IPT and reduce workloads. Further time and motion studies for IPT pump initiations are needed.

Abstract ID: 414

Increasing access to Diabetes Structured Education (DSE) with digitally-delivered care

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Barking and Dagenham has an ethnically diverse, relatively young population with a higher than UK average diabetes prevalence. In 2017/18 as many as 73% of people with diabetes were offered DSE, but only 10.9% attended the predominantly face-to-face offer.^{1,2} Digitally-enabled programmes have the potential to improve accessibility to culturally relevant, convenient and engaging education. Here, we assess weight loss, uptake and retention of a DSE programme for adults living with type 2 diabetes (T2DM) in this community.

Materials and methods: Data from adults with T2DM following a 12 week digitally-enabled DSE programme were collected and analysed to determine weight loss and engagement. All patients had access to a smartphone App for digital learning materials and to monitor their intake, activity and clinical changes. Remote coach support was provided.

Results: 99% of referrals ($n=1,384$) were accepted to the programme, with 72% attending. 64% of those who started the programme completed it. Average weight loss at 12 weeks was 2.94kg (3.22%; $n=199$). There was an average increase in diabetes self-management confidence from 6/10 at baseline to 8/10 at 12 weeks. 51% of atten-

dees were male, 83% of participants were of working age and 72% of other ethnic origins, demonstrating greater access in those who are usually under-represented at traditional face-to-face DSE.

Conclusion: A fully remote digitally-enabled T2DM DSE and behaviour change programme is clinically effective, accessible and engaging and enables an increase in confidence in self-management of those groups living with T2DM who are harder to reach.

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Abstract ID: 418

Case study: diagnostic pitfalls in young adults with new diabetes

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We describe a 20-year-old male of Southeast Asian ethnicity who presented with polyuria, polydipsia, random glucose 10.1mmol/L, HbA_{1c} 81mmol/mol, weight 93kgs, BMI 28.8 and no ketonuria. His father was diagnosed with type 1 diabetes (T1DM) aged 20 years and his mother with type 2 diabetes (T2DM) aged 40 years.

Differential diagnosis included T1DM, T2DM or Maturity Onset Diabetes of Young (MODY). Three months after diagnosis his C-peptide was 996pmol/L, GAD/IA2 antibodies were negative and his HbA_{1c} 67 mmol/mol. The HbA_{1c} level was 53mmol/mol at six months post diagnosis on metformin alone.

Next Generation Sequencing was undertaken for a 34-gene MODY panel. Heterogenous variant c.[890A>G];[=] p.(Tyr297Cys) was detected in the Neuronal differentiation 1 (NEUROD1) gene which regulates expression of insulin gene. The variant has not been reported in the literature either as a pathogenic variant in affected individuals or in the general population (it is absent from ClinVar and gnomAD databases). MRI brain was normal and there were no clinical features of NEUROD1.

As decreased insulin secretion was suspected gliclazide 80mg twice daily was initiated seven months post-diagnosis and gave a slight improvement in glycaemic control. Two months later metformin was stopped and this gave rise to noticeable worsening of glycaemic control (libre glucose management indicator HbA_{1c} 68mmol/mol). After stopping gliclazide and restarting metformin the glycaemic control improved, with HbA_{1c} 54mmol/mol.

This case demonstrates the potential pitfalls of MODY testing in ethnicities known to have higher rates of T2DM. Presence of a genetic variant does not automatically confer a diagnosis and clinical correlation is essential. Clinically T2DM is the likely diagnosis, with the variant an incidental finding.

Abstract ID: 406

Hypoglycaemia on oral glucose tolerance test in pregnancy - is it significant?

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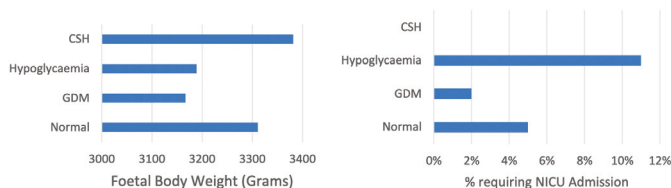
Background: Hypoglycaemia during an oral glucose tolerance test (OGTT) has been linked with poor pregnancy outcome but results are conflicting.

Method: Results of 75-grams 2-hour OGTT from 2017-2018 of 159 pregnant women were analysed. Women were divided into the fol-

lowing groups: normoglycemia (Fasting Blood Glucose [FBG] 4-5.5 mmol/L and 2-hour OGTT 4-7.7 mmol/L), gestational diabetes mellitus (GDM) (FBG \geq 5.6 mmol/litre or 2-hour OGTT \geq 7.8 mmol/L); hypoglycaemia (2 hr-OGTT 3-3.9 mmol/L); and clinically significant hypoglycaemia (CSH) (2 hr-OGTT $<$ 3 mmol/L). Endpoints were maternal body mass index (BMI), foetal body weight (FBW), mode of delivery and admission to the Neonatal Intensive Care Unit (NICU).

Results: Maternal BMI was significantly lower in the hypoglycaemia group ($p=0.04$) but not in those with CSH ($p=0.89$). FBW was non-significantly higher in those with CSH ($p=0.69$) (See Table and Figure below).

OGTT Test	Normal (n=39)	GDM (n=41)	Hypoglycaemia (n=63)	Clinically Significant Hypoglycaemia CSH (n=16)
BMI	30.43	31.43	27.25	30.09
FBW (grams)	3311	3167	3188.9	3381.6
Normal Delivery	72%	44%	68%	75%
Elective Caesarean section	13%	18%	10%	13%
Emergency Caesarean section	13%	38%	21%	6%
Assisted Instrumental Delivery	3%	0%	2%	6%
Admission to Neonatal ICU	5%	2%	11%	0%



Mode of delivery was not significantly different between normoglycemia and the two hypoglycaemia groups ($p=0.74$ for hypoglycaemia and $p=0.82$ for CSH). The GDM group was significantly more likely to require emergency C-section ($p=0.03$).

Neonates born to the hypoglycaemia group were more likely to require NICU admission but this was non-significant ($p=0.3$). None of the neonates born to the CSH group required admission to the NICU ($n=16$).

Discussion: Neonates born to mothers who had hypoglycaemia on 2-hour OGTT were more likely to require admission to neonatal ICU; however, this finding was statistically non-significant. Furthermore, their mode of delivery was non-significantly different to the normoglycemic group. Currently, there is insufficient evidence to advocate intense monitoring or treatment in pregnant women who develop hypoglycaemia on OGTT.

Abstract ID: 401

A series of diabetic ketoacidosis associated with the use of sodium-glucose co-transporter-2 inhibitors in secondary care
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Background and aims: Sodium-glucose co-transporter-2 inhibitors (SGLT-2i) are associated with diabetic ketoacidosis (DKA), though limited real-world case series are published. The aim of this study is to examine the number and characteristics of patients admitted with SGLT2i-associated DKA to our hospital over a 4-month period.

Methods: Patients were identified retrospectively following referral to the diabetes team with SGLT2i-associated DKA between September-December 2021. Medical notes were reviewed and data related to the patients' characteristics, diabetes control, usual medications and previous medical comorbidities were collected.

Results: Twenty-two patients with SGLT2i-associated DKA were iden-

tified; 21 (95.5%) were hyperglycaemic and 1 (4.5%) was euglycaemic. Patients had a mean age (\pm standard deviation) 60.8 ± 12.3 years and HbA_{1c} 89.2 ± 29.2 mmol/mol (10.3%). Of these patients 45.5% were diagnosed with DKA alone, though some had concurrent bacterial (27.3%) or COVID-19 (18.2%) infection. There was significant treatment heterogeneity; nine (40.9%) patients were treated with insulin and 13 (59.1%) patients with other agents. Thirteen (59.1%) patients had no significant medical co-morbidity, though nine (40.9%) patients had underlying cardiovascular, respiratory and/or malignant co-morbidity. Of the 22 patients admitted with DKA, 19 (86.4%) were discharged alive, and three patients (13.6%) died during the admission. **Conclusion:** We observed no specific characteristics which predisposed to SGLT2i-associated DKA or more severe ketoacidosis in this cohort, consistent with previous studies. Most cases were in hyperglycaemic DKA, and people with SGLT2i-associated euglycaemic DKA may have been missed. Given the number of cases observed in our hospital and the associated mortality, greater awareness of the condition is essential.

Abstract ID: 423

Diabetes pathways for the management of patients at risk
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Background: Insulin dose adjustment in diabetes is challenging and often patients continue to have poor control despite insulin treatment.^{1,2} Repeated episodes of severe hypoglycaemia increase healthcare costs and can have serious health consequences.³

Methods: We developed two care pathways, describing a structured

approach for patients on insulin (High HbA_{1c} Pathway) and for patients with concerning hypoglycaemia (Problematic Hypoglycaemia Pathway). Intensive nurse support clinics, an App for remote monitoring and a weekly Diabetes MDT meeting were introduced. One year after introduction the outcomes were reviewed.

Results: On the high HbA_{1c} pathway, mean HbA_{1c} reduction on the first cohort was by 22.4 mmol/mol for the 25 patients (57%) with repeat values available. This compares favourably to a historic cohort from 2019, receiving standard care, who had a mean HbA_{1c} reduction of 1.4 mmol/mol. On average, 11.6 patient contacts with the diabetes team over a year were noted, which represents a significant increase compared to historic data of 1.8 contacts over six months. The number of patient contacts in this sample did not correlate statistically with the HbA_{1c} reduction.

All patients in the Hypoglycaemia Pathway had type 1 diabetes, with a mean HbA_{1c} of 60 mmol/mol. On review, concerning hypoglycaemia had resolved in 9 (50%) patients, 14 (78%) patients were using intermittent glucose monitoring sensors, 1 RTCGM and 6 were established on an insulin pump.

Conclusions: A proactive approach in identifying and managing patients with diabetes at risk results in meaningful clinical outcomes, with HbA_{1c} improvements and reduction in concerning hypoglycaemia.

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