Abstracts from ABCD Diabetes Update

31st January - 2nd February 2024, Loughborough, UK

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Br J Diabetes 2024;**24**(1):111-114
https://doi.org/10.15277/bjd.2024.452

Abstract ID: 17

Preconception: How far do we go?

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This case describes a 42-year-old woman with a medical background of type 2 diabetes mellitus (T2DM) since 2012, polycystic ovarian syndrome, a history of ectopic pregnancy and left salpingectomy in 2019. She has two children, born in 2016 and 2020. She was under close follow-up during her last pregnancy and ended up with an emergency Caesarean section at 34 weeks' gestation, giving birth to a 4 kg girl. A copper IUD was inserted post-delivery. She mentioned in clinic visits afterward that her family was now complete and she was discharged back to primary care on metformin.

She was referred again to the pre-conception diabetes clinic in May 2022 as she wanted to try again for a baby in the hope of having a son. Her diabetes was poorly controlled, with an HbA1c of 9.9% (85 mmol/mol). She also mentioned seeing partially digested metformin tablets in her stool. This was changed from slow-release 500 mg twice daily to immediate-release metformin 850 mg twice daily. She was advised to increase blood glucose monitoring, given lifestyle advice to improve diet and exercise and was commenced on folic acid 5 mg once daily.

In August 2022, her HbA_{1c} had improved slightly to 9.1% (76 mmol/mol) and she was commenced on Degludec 6 units and seen by the dietician and diabetes specialist nurse, who reinforced lifestyle modification advice. At the next follow-up in January 2023, her HbA_{1c} had further improved to 7.8% (61 mmol/mol) and she was under regular follow-up with the diabetes specialist nurse. On further enquiry, her periods were irregular and occurring every 40 days. She was started on the Freestyle Libre 2 sensor device and a day 21 progesterone level was requested, which came back < 0.6 nmol/l. She was advised not to conceive until her HbA_{1c} had improved to 6.5% (48 mmol/mol). She was followed up in the joint pre-conception clinic in November 2023; her HbA_{1c} was 8.5% (69 mmol/mol) and her Libre data showed high blood sugars post meals. She was commenced on short-acting insulin Fiasp before meals. This led to an improvement in time in range to 67%, and a GMI index of 7.4% (57 mmol/mol).

The team had a long discussion with the patient and her family about the possible complications of pregnancy with poor diabetes control, with increased age and her previous obstetric history and, importantly, the possibility of not having a baby boy even if she conceived. However, she would still be supported throughout this journey to ensure best possible outcomes.

This case tackles the common challenges and pressures faced by women of ethnic minorities under pressure from their families/society to have a boy even despite poor diabetes control. This needs attention from healthcare providers, and from society as a whole.

Abstract ID: 18

Diabetes and pancreatic Malignancy in a post bariatric patient: a case of diagnostic challenges and clinical uncertainty

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A 66-year-old female patient with a background of previous laparoscopic gastric bypass in 2008 and diet-controlled diabetes presented with weight loss and abdominal bloating. A CT TAP showed a 21mm head of pancreas lesion and a 13mm left supraclavicular lymph node (LN). The surgical opinion was that endoscopic ultrasound (EUS) was not possible since the previous gastric bypass precluded access to the pancreatic head lesion. Therefore, the aim was to biopsy the LN. Subsequent fluorodeoxyglucose (FDG) PET CT showed there were no FDG-avid LNs. Therefore there was no accessible biopsy target.

A month later, the patient was admitted to hospital with painless jaundice, pale stools and itching. A repeat CT TAP showed biliary tree obstruction with intra- and extrahepatic duct and pancreatic duct dilatation. The pancreatic lesion was also noted to have increased in size. The patient had a biliary drain (PTB) inserted via an interventional radiology (IR) route to relieve the jaundice. It was also noted that pancreatography (ERCP) would not be possible due to the previous gastric bypass. During this admission, routine capillary blood glucose (CBG) monitoring noted that readings were high (17-25 mmol/L) throughout the day. This new insulin requirement was thought to be due to pancreatic diabetes, and therefore the patient was started on a basal bolus insulin regime. The PTB was subsequently internalised. The patient was commenced on neoadjuvant folfirinox chemotherapy. After the third cycle on folfirinox, the patient was admitted with a hypoglycaemic event. The hypoglycaemic event was thought to be precipitated by a lack of oral intake post chemotherapy and hypo advice was given. About one week later, the patient presented again with a hypoglycaemic event, blood glucose being only 1.3 mmol/L. A Libre sensor was applied, Novorapid was stopped and basal insulin was continued. C-peptide levels and diabetes triple antibodies were requested. For a period of four weeks, the hypoglycaemic events reduced in frequency whilst the patient remained on basal insulin alone. However, the hypoglycaemic

events then worsened. C-peptide results showed a low level, at 246 pmol/L (reference range: 370-1470 pmol/L). Diabetes triple antibodies were low at 3 unit/ml (reference range: 0-8 unit/ml). Unfortunately, the patient developed type 1 respiratory failure and and died.

We present this case to highlight the diagnostic challenges that patients may encounter after bariatric surgery, and to discuss the clinical uncertainty when managing diabetes in hypoglycaemic patients with low C-peptide levels.

Abstract ID: 24

Two lean 23-year-old women with new-onset diabetes

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There are a wide number of different aetiologies for young adults who develop diabetes mellitus. We describe two cases where the initial clinical diagnosis was incorrect.

Case 1: A 23-year-old white woman presented with hair loss. Initial investigations showed HbA_{1c} 58 mmol/mol, BMI of 23 kg/m^2 and ketones were negative. She was diagnosed with type 2 DM (T2DM) and treated with metformin in primary care. Despite maximal metformin and addition of gliclazide, her HbA_{1c} rose to 73mmol/mol by six months post-diagnosis. She was found to have positive antibodies (ICA 40, GAD 52, IA2 365) and a C-peptide of 1,131 pmol/l (glucose 8 mmol/l). Her diagnosis was reclassified as Type 1 diabetes (T1DM) and she was switched to a basal bolus insulin regimen.

Case 2: A 23-year-old South Asian woman, an elite basketball player, presented with weight loss of 5kg over two weeks and fatigue. HbA_{1c} was 84 mmol/mol and ketones were negative. BMI was 25.2kg/m^2. She had a strong family history of T2DM in both parents. She was referred to hospital for possible T1DM and treated with basal bolus insulin. It was noted that she had raised triglycerides of 8.4 mmol/l and four islet autoantibodies were negative at diagnosis. Her C-peptide was 2,195 pmol/l while a corresponding glucose was 23 mmol/L. Genetic testing two months after diagnosis revealed a PPARG mutation (familial partial lipodystrophy type 3). She was then switched to metformin and weekly dulaglutide, with gradual weaning off insulin. Her HbA_{1c} reduced to 49 mmol/mol and triglycerides to 2.9 mmol/L.

Discussion: Age of onset and an acute clinical presentation have traditionally been used to assign a diagnosis of T1DM or T2DM. However, as can be seen from these cases, fairly similar presentations can lead to different initial conclusions.

In both these cases islet autoantibodies were helpful in leading to the eventual diagnosis. Islet autoantibody testing is useful for those with high pre-test probability of T1DM such as age <35 years, BMI <25 kg/m^2, a history of autoimmune disease, catabolic symptoms or ketosis at diagnosis.

C-peptide is less useful to distinguish T1DM from T2DM at diagnosis due to residual endogenous insulin production in T1DM. Genetic testing should be considered in lean, antibody-negative young adults.

Summary: These cases highlight the importance of a thorough assessment of aetiology of diabetes at diagnosis, so patients receive appropriate treatment and support in a timely fashion.

Abstract ID: 25

Altered body image, disordered eating, and suboptimal glycaemic control in type 1 diabetes: Is technology and GLP1 agonists an option?

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Introduction: Disordered eating in type 1 diabetes (T1DM) is associated with diabetes distress and suboptimal glycaemic control. We present a case of T1DM with binge eating disorder, discussing the benefits of GLP-1 analogues with continuous subcutaneous insulin infusion (CSII) therapy.

Case: A 35-year-old female was diagnosed with T1DM in 2012, at 24 years of age, and commenced on basal bolus insulin. She had two pregnancies over the next seven years with good glycaemic control. There was pronounced dawn phenomenon post-pregnancy which was reflected in her erratic Freestyle Libre glucose readings. CSII therapy with Tandem T-slim was commenced a year later, in October 2020. Over the next 12-18 months, she was diagnosed with depression and hypertension, missed her outpatient diabetes clinic appointments, and struggled with diabetes management and fear of hypoglycaemia. During mid-2022 she developed mental health issues, with hallucinations and binge eating and a likely diagnosis of bipolar personality disorder. Later in the year, she was commenced on Tandem T-slim CSII and Dexcom G6 with Basal IQ technology. There was no evidence of retinopathy or neuropathy on annual diabetes screening.

During outpatient diabetes review in February 2023, there was recurrent insulin pump auto-suspend followed by rebound hyperglycaemia and hence overnight basal insulin was reduced. Six months later, her weight had increased and glycaemic control worsened due to continued binge eating, missing pre-meal boluses, and she continued to be under the mental health liaison team. Her insulin was changed from Novorapid to Lyumjev (after discussion with the patient due to licensing criteria with the insulin pump) to accommodate binge eating hyperglycaemia and she was supported by motivational interviewing whilst awaiting review by eating disorders services. A month later, in October 2023, after CSII MDT discussion, she was commenced on control IQ – hybrid closed loop (HCL). In November 2023, her GMI (Glucose Management Indicator) improved, and she was commenced on dulaglutide after full discussion and patient consent including licensing criteria in T1DM. A month later, her food cravings reduced, she felt more positive about diabetes self-management and her insulin requirement reduced from 108 units to 98 units (basal 38%, bolus 62%). Her weight, BMI, HbA_{1c} and ambulatory glucose profile data are shown in the Table.

Discussion: HCL helped to improve glycaemic control by increasing TIR and reducing HbA_{1c}. GLP-1 analogues have shown positive effects on reducing binge eating and weight loss. The

	Weight (kg)	BMI (kg/m²)	HbA_{1c} (mmol/mol)	GMI (mmol/mol)	TAR (>10.1 mmol/L)	TIR (3.9-10 mmol/L)
Non-HCL CSII	98.4	30	56	65	50%	40%
MH issues	110.8	34.6	58	65	61%	38%
Basal IQ CSII	114.5	35	58	59	41%	56%
Binge eating	118.4	36.6	73	74.8	79%	21%
HCL CSII	121.7	36.7	-	59.2	43%	57%
HCL+GLP1	117.5	35.5	66	57.6	37%	61%

BMI, Body mass index; TAR, time above range; TIR, time in range; TBR, time below range

combination of HCL and GLP-1 analogue in this patient resulted in lower insulin doses, positive attitude towards diabetes self-management along with improved clinical parameters and patient satisfaction.

Binge eating disorders are associated with obesity and increase in cardiovascular risk. GLP-1 analogues in obese T1DM patients improve metabolic profile, weight, HbA_{1c} and insulin requirement, with no increase in incidence of diabetic ketoacidosis or hypoglycaemia. There are no reported cases of T1DM with binge eating disorder on GLP-1 analogues in the literature and hence further studies are warranted.

Abstract ID: 29

The successful use of Medtronic 780g with guardian 3 sensor (hybrid closed loop) during pregnancy and post-partum in type 1 diabetes

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Background: Pregnant women with type 1 diabetes (T1DM) are advised to aim for target glucose levels of 3.9-7.8 mmol/L for at least 70% of the day to minimise risk of adverse outcomes for both mother and baby. This can be challenging in the physiologically dynamic state of pregnancy, and these women require 1-2 weekly input by a multidisciplinary team. Hybrid closed-loop (HCL) technology combines a continuous glucose monitor with an insulin pump that adjusts insulin delivery based on glucose levels, with additional manual mealtime boluses. The CamAPS FX platform is the only system currently licensed for use in pregnancy.

Clinical Case: A 27-year-old with T1DM conceived her third child while using the Medtronic 670g pump and Guardian 3 sensor showing a HbA_{1c} of 39 mmol/mol. At six weeks, glucose readings were above target (8-10 mmol/L). Insulin-carbohydrate ratios (ICRs) were adjusted and the low glucose suspend target was reduced to 3.4 mmol/L from 5.5 mmol/L.

During the second trimester, she was still struggling with post-prandial hyperglycaemia and nocturnal hypoglycaemia. She upgraded to the Medtronic 780g pump using smart guard mode to allow auto-basal/auto-corrections, with a lower target of 5.5 mmol/L (6.7 mmol/L on 670g).

By 32 weeks, time in range rose to 84% with a reduction in hypoglycaemia (12% to 6% time below range). Growth scans were reassuring throughout.

Delivery planning at 36 weeks aimed to continue HCL therapy if glucose levels were within range. Post-partum, a return to manual mode with pre-pregnancy basal rates (with 10-20% reduction) and usual ICRs was planned. She delivered a healthy male infant weighing 3660g after induction of labour at 38 weeks. Glucose control was excellent throughout (4.9-7.7 mmol/L) on HCL.

Post-partum, the patient forgot to switch to manual mode and had high post-prandial readings but no episodes of hypoglycaemia. Within 24h, the auto-mode had "caught up" and her control stabilised. HbA_{1c} 6 weeks post-partum was 48mmol/mol.

Discussion: It has been shown that HCL technology is effective and safe during pregnancy. This lady had excellent pre-conception glycaemic control and the HCL technology allowed a much more proactive approach to managing hyperglycaemia as the pregnancy progressed, which led to a positive obstetric and neonatal outcome. The technology, even in auto-mode, was able to cope with the rapid changes in insulin sensitivity pre- and post-partum without any evidence of severe hypoglycaemia in this case, supporting evidence that other platforms offer promise in controlling blood glucose levels safely in pregnancy.

Abstract ID: 32

Two interesting cases of Ketone prone diabetes or Flatbush diabetes

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Ketosis-prone type 2 diabetes (T2DM) is a form of diabetes that usually presents with diabetic ketoacidosis (DKA) in patients who are not insulin-dependent. It is commonly seen in African, African American and Hispanic populations. Although the pathogenesis is not fully understood, it is believed to be caused by stress-induced reversible beta-cell and alpha-cell dysfunction in the pancreas.

Here we discuss two patients who presented with DKA, with negative antibody screening for type 1 DM (T1DM) and high C-peptide levels.

Patient 1: A 38-year-old male of African Caribbean ethnicity required ITU admission when he collapsed in 2017, needing IV insulin. He was diagnosed with T1DM and started on Humulin I Bd and metformin. He was intolerant to metformin and eventually stopped taking it. He missed follow-up in the process of moving house.

He was reviewed in diabetic clinic in April 2023, at which time his HbA_{1c} was 61 mmol/mol. His weight was 108kg. He had recurrent ongoing hypoglycaemic episodes since starting on insulin. He was eating more to correct the recurrent hypoglycaemic episodes and consequently gained weight.

At this stage his diagnosis was revisited. Islet cell and GAD antibodies were negative and C- peptide was 1,337 pmol/l. On review of these results, his diagnosis was revised to Flatbush diabetes or T2DM. It was planned to wean him off insulin slowly, starting him on oral hypoglycaemic drugs and a GLP-1 agonist.

Patient 1: A 37-year-old male of African Caribbean ethnicity was admitted to WMUH in June 2023 with DKA. He was diagnosed with likely T1DM and discharged with Lantus OD and trurapi insulin TDS. He was also started on Freestyle Libre (FSL) monitoring. Eventually the insulin was weaned off by September 2023 due to recurrent severe hypoglycaemic episodes.

At clinic review on 20th October 2023 FSL data over the previous 14 days showed TIR 100%, High 0%, Hypo 0%, GMI 38mmol/mol, average glucose 5.3mmol/l, glucose variability 15%.

No polydipsia or polyuria had occurred since stopping insulin. His weight was 97 kg and BMI 31.1 kg/m^2. Review of investigations revealed C-peptide 1,003pmol/l, GAD Ab and Islet cell Ab negative. On review of these investigations, his diagnosis was revised as ketosis-prone T2DM.

Conclusion: Ketosis-prone diabetes can be a challenging diagnosis but a high degree of suspicion needs to be exercised in the non-Caucasian, high BMI African Caribbean population as its management strategy differs from that of typical T2DM.

Abstract ID: 35

The complexities of managing neuropathic pain

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We report a 75-year-old man who was referred to the diabetes foot clinic with pain complicating treated infected left foot ulcers. Following successful left lower limb revascularisation and an extended course of antibiotics his affected toes had mummified, with improvement of his severe ischaemic pain. However, he developed significant neuropathic pain. He was prescribed oxycodone but this caused hallucinations and confusion even at a low dose. He was subsequently commenced on pregabalin 75mg twice daily; however, the patient stopped it after feeling disorientated and off-balance. He was then trialled on a buprenorphine patch, which led to similar side effects to oxycodone. Amitriptyline was considered, but since he had been given a recent diagnosis of raised intra-ocular pressure this was not advised as this treatment is cautioned with closed-angle glaucoma. Furthermore, he was taking dutasteride for prostatic hypertrophy symptoms. Duloxetine was also considered but it was not initiated given the increased risk of bleeding while on anticoagulation for atrial fibrillation. While Capsaicin cream is a useful topical alternative, this was not suitable here as his dressings prevented application of the cream. Following discussion with pharmacy, he was restarted on pregabalin at the lower dose of 25 mg twice daily and his doxazosin dose was reduced to 2 mg daily (as pregabalin can occasionally cause hypotension). This combination brought him partial relief and he did not experience side effects at this dose. An arterial duplex suggested that there might be an additional vascular component to his pain. However, following MDT discussion, it was deemed that the risks of a further revascularisation outweighed any potential benefits. It was agreed that a proposed amputation of his dry gangrenous toes risked creating a much larger wound that might not heal and might result in worsening of his neuropathic pain. He has now been referred to a specialist pain clinic.

This case illustrates the complexities surrounding the management of painful peripheral neuropathy in an elderly patient with multiple co-morbidities and polypharmacy. Clinicians should be aware of the important side effects associated with the common neuropathic agents, in addition to their cautions and contra-indications. MDT input from podiatry, radiology, microbiology and vascular surgery are essential to optimise the treatment of diabetes foot infections associated with vascular disease since this can exacerbate neuropathic pain.

Abstract ID: 38

Diabetes management challenges and end-of-life considerations in a complex case of dementia

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We present a case of a 75-year-old male with Alzheimer's dementia, T1DM, hypertension, benign prostatic hyperplasia and heterozygous β-thalassemia, who experienced multiple complications and challenges in diabetes management during the last months of his life. He was admitted with increased drowsiness, lethargy, mobility decline, falls, head and shoulder pain and dysphagia. He had microcytic anaemia, an elevated WBC count and a chronic odontogenic infection. He underwent a biopsy of the maxillary sinus that ruled out malignancy and was treated with antibiotics. He was also diagnosed with closed-angle glaucoma and started treatment.

His blood glucose control was erratic, with frequent hypoglycemic and hyperglycemic episodes. Despite several changes to his insulin regimen, his blood glucose remained erratic and this was compounded by ambiguity of diabetes type (T1DM vs T2DM). Initially, insulin was also omitted due to hypoglycaemia, which unfortunately led to diabetic ketoacidosis (DKA). He was escalated to the level 1 unit and later stepped down to the health care of the elderly ward and fast-tracked home with anticipatory medications and a simplified regimen of Degludec once daily administered by his wife. Despite this he was readmitted with DKA and treated accordingly. He tested positive for SARS-CoV-2 but was asymptomatic. He was discharged to a nursing home on a modified sliding scale insulin regimen of rapid-acting insulin doses dependent on blood glucose ranges. He died shortly after at the nursing home. This case illustrates challenging and ethical dilemmas that are frequently encountered in the elderly population with diabetes. The patient had dementia and multiple co-morbidities that complicated his diabetes management and end-of-life care. This case underscores the need for an individualized care plan that takes into account patients' preferences, goals and values as well as the involvement of their carers and family members in the decision-making and management process. It also demonstrates the necessity of a multidisciplinary approach and early consultation with the specialist diabetes team to optimize the patient's quality of life and minimize suffering.