

Abstracts from ABCD Diabetes Update 2025

29th to 31st January 2025, Holywell Park Conference Centre, Loughborough University
Science and Enterprise Park, Loughborough, UK

The winning abstracts were published in the June issue. The following are all the abstracts presented.

Br J Diabetes 2025;25:ONLINE PUBLICATION
<https://doi.org/10.15277/bjd.2025.486>

Category: Chronic kidney disease and diabetes

Serial Number: 51

Submission ID: 18124

Management of worsening diabetic nephropathy in pregnancy

Nadia Osman, Kirun Gunganah

Newham University Hospital, Barts Health NHS Trust

A 34-year-old Ghanaian woman with a complex obstetric history, including seven miscarriages, recurrent pre-eclampsia, placental abruption, a neonatal death at 18 months and a baby with a neural tube defect, presented 11 weeks into her 11th pregnancy. Her medical history also included hypertension, type 2 diabetes and chronic kidney disease (CKD) secondary to diabetes and hypertension. At her booking appointment, her blood pressure was poorly controlled at 187/90 mmHg, her HbA_{1c} was elevated at 76 mmol/mol, creatinine was 258 nmol/L, estimated glomerular filtration rate (eGFR) was 18 ml/min, and her urinary protein-to-creatinine ratio (UPCR) was 579.31 mg/mmol.

During her initial consultation, the team discussed the risks posed to both mother and baby by her poorly controlled diabetes, hypertension and CKD. These included risks of stillbirth, accelerated decline in renal function requiring dialysis, and escalated hypertension with the potential for an intracranial bleed. The option of a termination was offered, but the patient chose to proceed with the pregnancy. She was managed in a multidisciplinary team (MDT) clinic, involving a diabetologist, renal physician, obstetrician, midwife and diabetes specialist nurse (DSN). Her blood pressure was optimised using pregnancy-safe antihypertensive medications, and her diabetes was managed with insulin. She was also started on aspirin to reduce the risk of pre-eclampsia, a renal-appropriate dose of venous thromboembolism (VTE) prophylaxis and erythropoietin (EPO) injections. Although she did not require dialysis during pregnancy, she developed pre-eclampsia at 32 weeks: serial growth scans demonstrated intrauterine growth restriction (IUGR) and polyhydramnios.

An MDT-recommended plan for early delivery by Caesarean section at 34 weeks, along with tubal ligation and possible dialysis around delivery, was discussed. Despite detailed counselling, the patient declined an early delivery. She went into spontaneous labour at 33 weeks and 1 day, with the baby requiring neonatal intensive care for respiratory distress but ultimately making an uneventful recovery.

Following delivery, the patient required further blood pressure optimisation. Her eGFR had dropped further to 8 ml/min, prompting a referral to the renal clinic. Four months postpartum, she presented with acute pulmonary oedema and was subsequently started on dialysis.

Conclusion: In England, chronic kidney disease affects an estimated 15,000 to 20,000 pregnancies each year, a number that is expected to rise. CKD significantly increases the risk of adverse outcomes in pregnancy for both mother and baby. Managing pregnancy in women with CKD requires a sensitive, multidisciplinary approach, shared decision-making, close monitoring in a supportive environment and effective pre-conception counselling.

Serial Number: 55

Submission ID: 18130

Simultaneous kidney pancreatic transplant. A life-changing experience in a patient with diabetes and chronic kidney disease

Qurat Ul ain Tanveer, Christine Leong

Croydon University Hospital NHS Trust

Case report: The patient was a 39-year-old female with type 1 diabetes (T1DM) diagnosed in 1999, with a background of poor diabetes control and hospital admissions with diabetic ketoacidosis (DKA). Her HbA_{1c} usually remained in the range of 80-90 mmol/L. The main causes of her poor diabetes profile appeared to be her fear of hypoglycaemia, poor vision and low mood.

In 2013, she was noted to have bilateral proliferative diabetic retinopathy with macular leakage. She underwent pan-retinal laser photocoagulation which rendered her partially blind: she had complete right eye blindness with a cataract in her left eye. In 2019 she was admitted to hospital with accelerated hypertension. Her blood pressure (BP) was 200/110 mmHg and she had disturbed kidney function with raised urea 11.8 mmol/L, serum creatinine 168 umol/L, potassium 6.5 mmol/L and raised albumin creatinine ratio of 45. She was started on bumetanide and minoxidil for her labile blood pressure and significant peripheral oedema.

Over time, she developed symptoms of gastroparesis and her chronic kidney disease (CKD) progressed due to poor diabetes control. She was a heavy smoker, having smoked 20-30 cigarettes a day since the age of 12-15 years.

In 2020 she was started on a Libre sensor and Omni pod DASH insulin pump. Her diabetes profile improved: her HbA_{1c} was still 70-80 mmol/l but her time in range was noted to be 67%. In 2022 she began to have frequent hypoglycaemic episodes due to increased insulin sensitivity. She was put on the waiting list for a hybrid closed-loop device.

In 2020 her low eGFR of 36 ml/min triggered the renal team to start discussion around future haemodialysis, peritoneal dialysis and simultaneous kidney pancreas transplant (SPK) as management options. Workup for SPK transplant was initiated including HLA typing and was completed in 2021. She was referred to the transplant team. The Covid pandemic suspended the transplant programme at that time.

From 2020 till mid-2023, she was managed conservatively by the renal team. The dialysis decision was kept on hold as her kidney function remained stable with an eGFR of 10-17 ml/min and she continued to pass urine normally. She had two failed arteriovenous fistulae due to significant peripheral arterial disease. No gastroparesis was noted and metoclopramide was started for her ongoing nausea and fullness.

In November 2023 she was called for elective admission for SPK at Guys and St Thomas' Hospital.

Pre- and post-operatively she tolerated the transplant procedure without any complications.

Post-transplant she developed lymphoproliferative disorder in the pancreatic graft. She received eight cycles of rituximab as recommended by the lymphoma MDT. The renal transplant graft developed a cytomegalovirus infection and she was started on valganciclovir. She remained off mycophenolic acid (MMF) and was not on prednisolone.

At her recent clinic review in March 2024, her blood pressure was noted to be 159/82 mmHg and her weight stable at 56 kg. Blood results were negative for EBV and CMV. Her insulin was stopped as her HbA_{1c} was noted to be 42 mmol/mol, her creatinine had come to baseline at 60-70 mmol/L and her amylase level was normal. She was discharged to the local renal team for further review of WCC, CMV and EBV viral loads.

Her diabetes antibodies was noted to be positive. What would be the clinical spectrum post-transplant and how long will the pancreatic and kidney graft work?

Category: Diabetes management in people with disabilities and learning difficulties

Serial Number: 50

Submission ID: 18123

Admission avoidance: an MDT effort

Henna Patel

Whipps Cross Hospital, Bart's Health Trust

Case report: A 48-year-old male with a background of type 1 diabetes (T1DM) and Down syndrome presented with severe diabetic ketoacidosis (DKA) in 2016. He lived in supported accommodation. Over the next two years he would present in a

similar manner more than 12 times, including one admission to intensive care requiring intubation and inotropic support. During this period several attempts were made to reduce his admissions to hospital with DKA. Initially his insulin regime was adjusted from a mixed twice-daily insulin to a basal-bolus regime with insulin degludec to provide long-acting basal cover. He was further investigated for a trigger of ketoacidosis with an MRI scan of the small bowel given previous episodes of intussusception; the findings were unremarkable. Despite this, he had further admissions with DKA.

At this point a decision had to be made whether his current carers had adequate training to support someone with T1DM. A multidisciplinary team (MDT) was formed with the patient's brother and a learning disabilities nurse along with carers and the diabetes team. It was felt strongly that moving him from his familiar environment to a nursing home would not be beneficial, as the insulin adjustment or titration would not be undertaken by the nurses in the home and therefore further admissions would not be prevented. He would also be psychologically impacted by this move, given his familiarity with his current accommodation.

Following this outcome a wider community MDT was set up. This included the patient's brother, the learning disabilities nurse, the supported accommodation manager, the inpatient diabetes team (doctors, nurses and dieticians), a representative from the care commissioning group, the patient's GP, the district nurses and the community diabetes nurses. Together the team was able to create meals plans based on the patient's favourite/ most eaten meals and snacks, the carbohydrate content and insulin requirements. They gave target glucose and training on interpreting ketone readings as well as sick day rules; and recognising and treating hypoglycaemia. His carers and district nurses were given direct contact to the community and secondary care diabetes nurses for advice in real time. A continuous glucose monitoring device was tried but was disliked by the patient. By implementing a multi-disciplinary plan and placing the patient at the centre of care, as well as working as a team, a further admission was prevented for two years.

Serial Number: 59

Submission ID: 18183

Management of recurrent hypoglycaemia in a patient with learning difficulties

R Tan, K Lovie, M Bennison, R Rathgeber, E Omari, K Hunt

Diabetes Department, King's College Hospital London

Case report: BI is a 25-year-old man who was diagnosed with type 1 diabetes (T1DM) when he was aged 10. He has Smith-Magenis syndrome, a genetic developmental syndrome associated with learning difficulties. He also has non-epileptiform seizures, anxiety and depression. BI transferred his care to King's College Hospital in May 2023. He was managing his diabetes with insulin injections and monitoring via a Freestyle sensor. While he had attended DAFNE, he struggled with carbohydrate counting. He lives in supported accommodation and studies science at college. Worryingly, BI was having

recurrent hypoglycaemia episodes (15 episodes in the 14 days prior to clinic) and was hypoglycaemic-unaware with a GOLD score of 6. He had had two severe hypoglycaemic episodes in the previous six months. His Time Below Range (TBR) (< 3.9 mmol/L) was 19% and TBR very low (<3.0 mmol/L) 10%. He was switched to a Dexcom G7 with predictive low alerts. A customised Novorapid corrective scale was agreed with him and he was educated to wait at least three hours between corrective doses. He had several face-to-face sessions with the diabetes dietician and nurses to cover the basics of carbohydrate counting and to reinforce glucose management. While TBR improved, he struggled with glycaemic variability.

The multidisciplinary team (MDT) decided to offer BI an Omnipod 5. Key to this decision was acknowledging that BI was motivated, meticulous with managing his diabetes (he kept a paper diary) and proactive in reaching out for help when struggling. The team organised several face-to-face sessions. He kept a photo diary of regular meals, which enabled the dietician to customise a carbohydrate counting booklet. He was switched to Dexcom G6 and the app linked to his iPad to facilitate sharing glucose levels with his support worker. BI had several practice sessions, attended in conjunction with his support worker, where he learned to insert and bolus saline through the pod. BI fitted his first pod with insulin in clinic one Monday. He was called daily and came to clinic that Wednesday and Friday for supervised pod changes, which he managed independently. It is early days, but BI is coping incredibly well and, importantly, his TBR is 1% low and <1% very low.

Learning points: This case demonstrates successful onboarding to a HCL system in an individual with learning difficulties. The team found ways to adapt resources such as a custom carbohydrate food diary and linking the Dexcom app to his iPad to enable data sharing with his support worker.

Serial Number: 56
Submission ID: 18131

A complex journey: supporting diabetes management in individuals with learning difficulties

Lida Amer, Rupinder Kochhar

Salford Royal Hospital, Greater Manchester

Case report: A 29-year-old woman with Down syndrome and type 1 diabetes (T1DM) diagnosed at age 17, initially maintained good glycaemic control on NovoMix 30 but experienced a decline in control over time. Her insulin regimen has been modified multiple times, currently consisting of Tresiba and NovoRapid before meals. Despite these changes, her glycaemic control remains suboptimal, with occasional hypoglycaemic episodes recognized primarily by her family.

Recent management adjustments have included the initiation of metformin to address insulin resistance and a trial of a continuous glucose monitoring (CGM) sensor. Her HbA_{1c} improved to 53 mmol/mol initially. However, glucose management indicators showed a Time in Range (TIR) of 37%, Time Below Range (TBR) of 3%, and a significant high glucose

percentage of 34%. The Glycaemic Management Indicator (GMI) remains elevated at 70 mmol/mol.

Given the complexities of her diabetes management and her reliance on family support, a multidisciplinary team (MDT) discussed the suitability of a hybrid closed-loop (HCL) insulin pump. Key concerns included the high risk of diabetic ketoacidosis (DKA) in case of insulin delivery interruption and the family's apprehension regarding her ability to operate and troubleshoot the pump safely. As an alternative, the team opted to initiate insulin therapy using a Smart Multiple Daily Injections (Smart MDI) system. This approach aims to assess her ability to engage with technology-based diabetes management before considering a transition to an HCL pump.

Conclusion: Managing T1DM in individuals with learning difficulties, such as those with Down syndrome, presents unique challenges. This case highlights the evolving complexity of diabetes care, necessitating tailored interventions that balance medical needs with patient capabilities and family involvement. The introduction of a Smart MDI system represents a stepwise approach to enhance her engagement in self-care while minimizing risks. If successful, this strategy may pave the way for future adoption of advanced insulin delivery systems, ultimately supporting improved glycaemic control and quality of life.

Serial Number: 48
Submission ID: 18118

Successful use of the Medtronic 780g closed-loop insulin pump in a woman with autism spectrum disorder and a learning disability

Rachel Flynn, Peter Jacob, Vicky Reilly, Amy, Shlomowitz, Sini Sheejo, Amanda Malinga, Martine Burrell, Christopher Garrett, Bobby Huda

Royal London Hospital & Mile End Hospital, Bart's Health NHS Trust

Case report: A 37-year-old woman with a six-year history of type 1 diabetes (T1DM) presented in March 2024 with hyperglycaemia, a urinary tract infection and high levels of diabetes distress. She was on multiple daily injections (Toujeo and NovoRapid) and using a Freestyle libre 2 sensor. Her HbA_{1c} was 113mmol/mol and she had background retinopathy. There were prior diagnoses of autism, dyslexia and dyspraxia, limited educational attainment and family support was necessary for activities of daily living. In the prior year sertraline had been initiated for low mood and there were multiple admissions for hyperglycaemia at a different Trust. Within two months, she had four admissions to hospital with hyperglycaemia. Issues identified included injection technique, lipohypertrophy, incorrect bolus timing, omission of insulin due to fear of hypoglycaemia and lack of dose adjustment. A simple mealtime insulin titration guide with in-built corrections was trialled, with re-education and learning disabilities team support. Despite this, her time in range (TIR) remained suboptimal at 9%, with an estimated HbA_{1c} of 109 mmol/mol and average glucose of 20 mmol/mol.

After discussion in our multidisciplinary team (MDT), she was

started on a hybrid closed-loop (HCL) insulin pump as an inpatient (Medtronic 780 g with guardian 4 sensor) with input from the pump company, pump diabetes specialist nurses (DSNs), inpatient DSN, learning disabilities team and diabetes psychiatrist. Videos of various processes were taken for the patient and her mother. The patient used a “simplified meal announcement” for mealtime boluses rather than precise carbohydrate counting. She was safely discharged and has had one attendance with a technical pump failure and one attendance unrelated to diabetes since. Her TIR has improved to 66% (over 30-day average), with minimal hypoglycaemia. Her most recent HbA_{1c} in July 2024 was 65 mmol/mol, with an estimated HbA_{1c} of 58.4 mmol/mol in September 2024 after lowering her pump target from 6.7 mmol/L to 6.1 mmol/L. At mental health follow-up depression was diagnosed and her antidepressant was altered. She has ongoing follow-up and remains well supported by the MDT. Conclusion: It is important as healthcare professionals not to limit access to diabetes technologies in patients with learning disabilities. The risks and benefits were considered, and an inpatient stay allowed support from the wider MDT, including invaluable input from our learning disabilities team. Although MDT contact has been time-intensive for this patient, emergency department attendances have reduced alongside improving diabetes distress and there is greater satisfaction surrounding diabetes management.

Serial Number: 47
Submission ID: 18114

Beyond blood sugars: challenges to T1DM management in a patient with IDD (Intellectual and Developmental Disabilities)

Apichaya Amrapala, Hema Lata Veerasamy, Elaine Hui

Northwick Park Hospital, London North West University Hospital Trust

Introduction: Diabetes is more prevalent in people with Intellectual and Developmental Disabilities (IDD) than the general population,¹ and studies show that diabetes management is poor in these patients.² We present a case to highlight some of the challenges.

Case report: A 22-year-old female with IDD and type 1 diabetes (T1DM) diagnosed at age 14 has been under our care since 2018. Born prematurely at 34 weeks in Romania with failure to thrive and significant developmental delay, she had a delayed diagnosis of congenital hypothyroidism at the age of 6. She is a non-verbal wheelchair user who is entirely dependent on her mother (the primary carer), who speaks limited English. Historically she had multiple hypoglycemic episodes and frequent hospital admissions.

Her admission in April 2022 revealed ongoing issues with care optimization. This triggered multi-disciplinary team (MDT) management from adult and paediatric diabetologists, diabetes specialist nurses (DSNs), dietitians, the complex discharge team and interpreters to create a personalized care plan detailing dietary and blood glucose monitoring recommendations, diagrams of insulin pens and doses, safety netting advice and

reasonable adjustments for physical exercise and equipment storage at her special-needs school. This care plan was distributed to her school, social worker and primary care physician, and a translated copy was provided to her mother, who received intensive carer education. Text reminders were sent prior to appointments and our DSNs maintained regular contact with her mother and school for insulin dose adjustments, which are currently optimised to Humulin M3 6 units pre-breakfast and lunch and Tresiba 7 units at bedtime. Her care plan is regularly reviewed and updated. These collaborative approaches reflect person-centred care planning, maximising information accessibility, provision of reasonable adjustments and training of staff and caregivers, all of which are enablers to optimal diabetes care.³ Her mother demonstrates good understanding of the care plan but has occasionally let Novorapid and test strips run out. The patient had significant absences from school due to recurrent pressure sores and non-functioning wheelchair brakes, which reflects underlying socioeconomic challenges and high carer burden. Achieving good glycaemic control and her weight gain have been challenging (HbA_{1c} range 73-93), but we observed a reduction in hypoglycaemic episodes and hospital admissions after care plan implementation.

Discussion: Engaging multidisciplinary teams for person-centred care in line with NHS RightCare pathway for diabetes is crucial.⁴ Further research and case sharing on management of patients with IDD are needed to help improve outcomes, and potential drag factors in care optimization require further analysis.

References

1. McVilly K, McGillivray J, Curtis A, Lehmann J, Morrish L, Speight J. Diabetes in people with an intellectual disability: a systematic review of prevalence, incidence and impact. *Diabetic Medicine* 2014;**31**(8):897-904. <https://doi.org/10.1111/dme.12494>
2. Shireman TI, Reichard A, Nazir N, Backes J M, Greiner KA. Quality of diabetes care for adults with developmental disabilities. *Disability Health J* 2010;**3**(3): 179-85. <https://doi.org/10.1016/j.dhjo.2009.10.004>
3. Holden B, Lee A. Barriers and enablers to optimal diabetes care for adults with learning disabilities: a systematic review. *Br J Learn Disabil* 2022;**50**:76-87. <https://doi.org/10.1111/bld.12393>
4. NHS England (2017). RightCare Pathway: diabetes reasonable adjustments for people with a learning disability who have diabetes. NHSE, London. Available at: <https://www.england.nhs.uk/rightcare/wp-content/uploads/sites/40/2017/11/rightcare-pathway-diabetes-reasonable>

Category: Enteral and parenteral feeding and diabetes management

Serial Number: 68
Submission ID: 18196

Utilisation of hybrid closed-loop pump technology in managing glycaemic control in challenging inpatient cases on enteral feeding and steroid therapy

Hassan Ibrahim

Cambridge University Hospital

Background: Enteral feeding is commonly employed in hospitals to provide nutritional support, particularly in patients with

diabetes. However, managing glycaemic control in individuals receiving enteral nutrition can be difficult, especially when combined with high-dose steroid therapy.

Case study: A 48-year-old male patient was admitted for a cranioplasty following a previous craniectomy for an intracranial haemorrhage (ICH) in 2021. The patient had a prolonged hospital stay due to post-operative complications, including perihemorrhagic bleeding. On admission, he was receiving metformin, dapagliflozin and gliclazide for diabetes management. Post-operatively, the patient was placed on continuous enteral feeding and started on high-dose prednisolone (20 mg daily). Despite these interventions, his blood glucose levels remained persistently elevated, necessitating the initiation of a Variable Rate Intravenous Insulin Infusion (VRIII). Due to his slow recovery and continued steroid treatment, the tapering of prednisolone was prolonged. After two weeks of VRIII, the patient's glucose levels stabilized. He was then transitioned to subcutaneous pre-mixed insulin administered twice daily, timed to coincide with the start and midpoint of his enteral feed. At this point, he was still receiving 15 mg of prednisolone daily. Over the subsequent 4–6 weeks, his diabetes management was optimized through titration of the pre-mixed insulin dose, an increase to three times daily dosing, the introduction of Novorapid insulin as needed, and the reintroduction of metformin. As the patient's oral intake improved, his enteral feeding was gradually reduced. However, despite these adjustments, blood glucose levels remained poorly controlled, prompting the team to transition him to VRIII once again. Following a multidisciplinary discussion, it was decided to initiate a hybrid closed-loop (HCL) insulin pump system (CAMPAPS HX, using the Dana RS Insulin Pump and Dexcom G6 glucose sensor). This system significantly improved glycaemic control, reducing blood glucose excursions. Unfortunately, the patient required a second surgery, and HCL therapy was discontinued in favour of resuming VRIII.

Conclusion: This case highlights the potential role of HCL insulin pump technology in managing challenging glycaemic control in patients receiving enteral feeding and high-dose steroids during inpatient care. It underscores the importance of personalized, adaptive insulin therapy in complex clinical situations.

Serial Number: 64
Submission ID: 18192

The impact of insulin therapy on mortality in patients receiving nasogastric and parenteral feeding

Maha Khalid, Philip Newland-Jones, Khalid Malkawi

University Hospital of Southampton

Background: The administration of nutrition through nasogastric (NG) or parenteral feeding in hospitalized patients is common, especially in critically ill or post-surgical individuals who cannot consume food orally. However, in patients receiving concurrent insulin therapy, the management of glucose levels can be challenging due to the altered metabolic response associated with enteral or parenteral nutrition. This abstract investigates the impact of insulin therapy on patients undergoing NG or

parenteral feeding, with a focus on adverse outcomes, including mortality. The findings reveal a significant association between insulin therapy during NG or parenteral feeding and the occurrence of severe hypoglycemia or hyperglycemia, which may contribute to fatal outcomes.

Case report: Our patient was started on NG feeding and his insulin dosing and timing were adjusted accordingly. During the night shift, the patient pulled out his NG tube and it was very difficult to re-insert it. He was given his full dose of insulin, calculated according to the calories in the feed. The nurses reacted to this event by putting in an online request for the junior doctors to come and prescribe IV fluids. Unfortunately, this did not happen quickly. The patient then developed very severe hypoglycaemia and despite all efforts to resuscitate him, he did not respond and he died. This was a very tragic and avoidable death which prompted a major investigation and changes to the way of dealing with such an issue. Many lessons were learned.

Conclusion: Further research into optimal glycaemic management strategies in patients receiving nutritional support could help to improve clinical outcomes and to reduce mortality rates associated with insulin therapy in this vulnerable population.

Category: Management of hyperglycaemia and steroid (glucocorticoid) therapy

Serial Number: 53
Submission ID: 18126

Steroid-induced diabetic ketoacidosis in a patient treated for COVID-19 pneumonitis

Dalhatu Yusuf

Bristol Royal Infirmary Hospital, University Hospital Bristol, and Weston NHS Foundation Trust

Background: Corticosteroid treatment is known to potentially cause hyperglycaemia, affecting 46–68% of individuals who receive steroid therapy. This hyperglycaemic effect can worsen pre-existing diabetes and may lead to the development of new diabetes in 34.3–56% of patients receiving steroid treatment. However, steroid-induced diabetic ketoacidosis (DKA) is rare, with only a few cases reported to date. We present the case of a 46-year-old obese male of African descent with no prior history of diabetes mellitus who developed DKA after starting corticosteroids for COVID-19 pneumonitis.

Case presentation: A 46-year-old man was admitted to the hospital for COVID-19 pneumonitis. After receiving treatment, he was discharged with a plan to complete a 10-day course of dexamethasone. About a month later, he returned to hospital with symptoms of polyuria, polydipsia, fatigue and an unintentional weight loss of 11 kg, which began shortly after his discharge while he was still on steroids. He has no significant medical history but has a strong family history of type 2 diabetes: both his mother and sister have diabetes. On examination, his blood pressure was 141/92 mmHg, his heart rate

was 111 bpm, he was afebrile and his body mass index (BMI) was 32 kg/m². Initial laboratory tests confirmed a diagnosis of diabetic ketoacidosis (capillary blood glucose [CBG] 29.6 mmol/L, ketones 4.6 mmol/L, pH 7.29). His HbA_{1c} on admission was 142 mmol/mol. Although no previous HbA_{1c} records were available, a glucose level from a blood gas test conducted two months earlier was noted to be 5.8 mmol/L.

He was treated with intravenous insulin using the hospital's DKA protocol. After his DKA was resolved, he was switched to a basal-bolus insulin regimen and discharged with this plan. Tests for diabetes autoantibodies were negative. Following a diabetes MDT discussion, metformin and Ozempic were added to his insulin. His HbA_{1c} gradually improved to 42 mmol/mol, and his insulin requirements significantly decreased. He stopped using insulin about 24 months after diagnosis.

Conclusion: Our patient developed DKA after receiving dexamethasone for COVID-19 pneumonitis despite having no prior diagnosis of diabetes. The timing of the steroid treatment and the absence of other triggers suggest that the steroids likely caused the DKA. Negative autoantibodies, along with obesity, ethnic background and initial DKA presentation, suggest a diagnosis of steroid-induced ketosis-prone diabetes mellitus. Steroid-induced diabetic ketoacidosis (DKA) may be more common than previously reported. Individuals with obesity and other metabolic risk factors requiring steroids should be closely monitored for DKA symptoms.

Category: Closed loops

Serial Number: 63

Submission ID: 18191

Complexities of managing severe complications in type 1 diabetes: a case of diabetic amyotrophy, gastroparesis and treatment-induced neuropathy.

Maria Tabasum, Nabeel Ahmed, Muneer Ahmed, Fareha Bawa, Haika Shoo, Scott Williams.

Countess of Chester Hospital NHS Foundation Trust

Case report: This case presents a 26-year-old woman with long-standing type 1 diabetes (T1DM), diagnosed at the age of 4, who developed multiple severe complications due to chronic suboptimal glycaemic control. Her history revealed an HbA_{1c} consistently above 100 mmol/mol for several years, contributing to diabetic peripheral neuropathy (DPN) and diabetic retinopathy. She was initially treated with a Medtronic 640 G insulin pump but discontinued it in 2021 due to safety concerns and poor blood sugar control. Unfortunately, the patient missed multiple follow-up appointments at her diabetes clinic during this period and had two admissions for diabetic ketoacidosis (DKA), highlighting the challenges in her diabetes management.

In July 2024, she was re-started on a Medtronic 780 G hybrid closed-loop (HCL) insulin pump. Shortly after initiating the pump, her glycaemic control improved dramatically, with HbA_{1c} reducing from 129 mmol/mol to 63 mmol/mol. However, this

rapid improvement led to treatment-induced neuropathy (TIND), marked by exacerbation of her painful DPN and the development of diabetic amyotrophy. The latter was confirmed by electromyography (EMG), showing sensorimotor axonal-demyelinating polyneuropathy. Symptoms included severe burning pain and weakness in the lower limbs. She was treated with intravenous methylprednisolone (SoluMedrol), which led to partial symptom relief.

The patient also developed gastroparesis, evidenced by postprandial nausea, constipation, diarrhoea and significant weight loss (12 kg over five months). Gastroscopy confirmed delayed gastric emptying and substantial food residue, with the condition attributed to microvascular damage from chronic hyperglycaemia. She was referred to a dietitian for nutritional support and prescribed Ensure supplementation to address her malnutrition. Despite improvements in glycaemic control, with a Time in Range (TIR) of 61% and an HbA_{1c} of 63 mmol/mol, the patient remains at high risk due to her low body mass index (BMI) (15.4 kg/m²) and ongoing gastroparesis. Pain management for her neuropathy, using amitriptyline and pregabalin, has also been difficult.

Conclusion: This case highlights the complexities of managing T1DM in a patient with severe complications such as diabetic amyotrophy, gastroparesis and peripheral neuropathy. It underscores the importance of regular clinic attendance and comprehensive foot examinations, which were notably missed during her period of non-compliance with follow-up appointments. Multidisciplinary care from endocrinology, neurology, gastroenterology and dietetics is essential in balancing glycaemic control with minimizing complications.

Serial Number: 65

Submission ID: 18193

A patient with type 1 diabetes with severe insulin resistance: use of a hybrid closed-loop system
Shahriar Shafiq, Ehtasham Ahmed, Ian Lawrence

University Hospitals of Leicester

Abstract: A 61-year-old man who was diagnosed at the age of 47 with type 1 diabetes (T1DM) was referred to the complex diabetes clinic at Leicester Diabetes Centre. His HbA_{1c} at the time of referral was 11.7%. He was taking insulin Humalog (Carb ratio 1:1) and Tresiba 47 units once daily. Historically his glycaemic control had been suboptimal since diagnosis: his HbA_{1c} was always between 11.5% and 12.2%. His body mass index (BMI) at diagnosis was 29.9 kg/m² and his current BMI is 34.4 kg/m². His anti-GAD antibody was 180.3 (high), but anti-IA2 and islet cell antibodies were negative. His past medical history includes hypertension, glaucoma, hyperlipidaemia, proliferative diabetic retinopathy and phimosis. His main concern was fear of hypoglycaemia. He was feeling uncomfortable when his blood glucose dropped below 10 mmol/L. Since his diagnosis he has had several admissions with hyperglycaemia and ketosis. His insulin degludec dose was gradually increased from 47 units to 60 units. He was seen by dietitians and attended DAFNE. Despite

these measures, his HbA_{1c} did not improve, and his insulin resistance was getting worse. His case was discussed by the pump multidisciplinary team (MDT) and he was commenced on an Omnipod 5 with Dexcom G6 sensor in July 2024, along with insulin degludec of 20 units. His time in range improved from 12% to 28% with the hybrid closed-loop system. Considering his weight and severe insulin resistance, he was also started on Mounjaro 2.5 mg.

Serial Number: 60
Submission ID: 18184

Use of hybrid closed-loop systems in end-stage renal failure

R Tan, C Manu, E Vanieri, S Harris, O Mustafa, C Gayle, K Hunt, G Gallen, E Wright, H Rogers, K Lovie, Y Cheah

King's College Hospital London

Case report: SC is a 49-year-old female who was diagnosed with type 1 diabetes (T1DM) at 20 months old. She has had poor glycaemic control throughout her life, developing proliferative retinopathy aged 19 years. Continuous subcutaneous insulin infusion (CSII) was started during pregnancy in 2008. With intensive healthcare professional support, her HbA_{1c} fell to 52 mmol/mol during pregnancy but post-partum she rapidly relapsed back to poor control (HbA_{1c} 91 mmol/mol) and her renal function deteriorated to chronic kidney disease (CKD) stage 3. She developed a pre-macular haemorrhage in 2009, eventually requiring vitrectomy in 2011. During a second pregnancy in 2014, her HbA_{1c} fell to 46 mmol/mol but this pregnancy was complicated by significant progression of proteinuria, necessitating early delivery at 30 weeks' gestation. Again, post-partum, there was rapid deterioration in glycaemic control, her HbA_{1c} rising to 93 mmol/mol within four months.

In March 2015 she was admitted in diabetic ketoacidosis (DKA), having run out of insulin in her pump. The multi-disciplinary team (MDT) decided to remove her pump and re-start multiple daily insulin injections. HbA_{1c} deteriorated to 116 mmol/mol and this was accompanied by progression of her CKD to end-stage renal failure (ESRF), necessitating initiation of peritoneal dialysis (PD) in April 2018.

In February 2021 she was admitted to hospital with a PD site infection, forcing a switch to haemodialysis (HD). Simultaneously she developed left foot ischaemia. Despite multiple angioplasties and a bypass, she required two digital amputations in August 2022 followed by trans-metatarsal amputation two months later. She continued to have issues with left lower limb ischaemia and chronic ulceration, eventually needing an above knee amputation in August 2024.

After a prolonged period of non-attendance, she was seen in the diabetes intensive clinic in August 2024. Her time in range (TIR) was 39%, with an HbA_{1c} of 77 mmol/mol and a high burden of anxiety related to her diabetes (Diabetes Distress Scale-2=7). There was a long MDT discussion about re-trial of CSII. The team acknowledged her previous high-risk self-management behaviours but also discussed the significant complications that

SC had developed. They decided to trial Omnipod-5 hybrid closed-loop technology (HCL), under opportunistic close supervision during her hospital dialysis sessions three times per week. She has already shown increased TIR.

Discussion points: HCL in ESRF is possible and helps with glucose variability between dialysis and non-dialysis days.

Patients with poor glycaemic control and multiple complications potentially would benefit the most from HCL.

Previous high-risk behaviour should not preclude someone from being considered for HCL.

Serial Number: 58
Submission ID: 18151

A young woman with type 1 diabetes mellitus and insulin resistance on a hybrid closed loop insulin pump

Angel Mary Joseph, Sam Matthew Pearson

Leeds Teaching Hospitals NHS Trust

Background: Hybrid closed-loop (HCL) insulin delivery systems have changed the management of type 1 diabetes mellitus (T1DM) tremendously, leading to improved quality of life, fewer hypoglycaemic episodes and more predictable glucose patterns. The growing problem of insulin resistance in people with T1DM is having a significant impact on glycaemic control and management despite optimised pump device settings, however. We explore here closed-loop optimization and adjunctive treatment for a person with T1DM.

Case history: A 31-year-old woman diagnosed with T1DM five years ago was reviewed in clinic. She presented initially with osmotic symptoms and thrush. Her HbA_{1c} at diagnosis was 93 mmol/mol and basal-bolus insulin was initiated.

Four years after diagnosis she was commenced on an Omnipod 5 HCL insulin pump. At initial review, she achieved 30% time in range. She had a total daily dose of 100 units of insulin through the pump. In addition, she was administering 45 units of long-acting insulin via injections twice a day, indicating a daily insulin requirement of 2 units/kg, suggesting insulin resistance. She had gained 11 kg (body mass index [BMI] 32.5 kg/m²) since her diagnosis despite diet and exercise.

Pump settings were reviewed. Her target glucose was set at 6.1 mmol/L, correct above glucose threshold was 10 mmol/L, her ICR was 1:5 and ISF was 1:1. She was 100% on automated mode and bolused approximately 3-4 times a day.

Pump settings were optimised to match the correction threshold to target glucose and reverse correction was turned off. Her insulin to carbohydrate ratio was increased to 1:3 since her post-prandial glucose was above target.

Although these changes increased TIR from 30% to 39%, insulin resistance needed to be addressed to further improve her TIR and reduce her insulin requirements. She was started on tirzepatide after explaining the risks and benefits (including that it was not yet licensed for T1DM) and ensuring she was using appropriate contraception. She continued an active lifestyle. She was also advised to reduce her basal insulin dose whilst on tirzepatide, with a plan to cease its use soon.

Within 10 weeks of tirzepatide initiation and pump optimization, her TIR improved to 83% without significant hypoglycaemia and her insulin requirements reduced to 60 units a day via HCL and 48 units a day via injected basal insulin. A further staged decrease in basal insulin was advised and a clinic review in six months was planned.

Serial Number: 54
Submission ID: 18129

Demonstrating the benefits of hybrid closed-loop technology in managing gastroparesis in type 1 diabetes

Nabeel Ahmed, Scott Williams, Maria Tabassum, Syed Haris Ahmed, Jane Bridges

Countess of Chester Hospital

Introduction: Managing type 1 diabetes mellitus (T1DM) alongside severe gastroparesis is a complex challenge due to the adverse effects on both glycaemic control and gastrointestinal function. Traditional treatment options often fail to provide adequate control, leading to erratic blood sugar levels and a decline in quality of life, with frequent hospital admissions and diabetic ketoacidosis (DKA). This case report explores the integration of the Medtronic 780G closed-loop system with regular intra-pyloric botulinum toxin (Botox) injections as a novel approach to managing these inter-related conditions.

Case presentation: We present the case of a 55-year-old female diagnosed with T1DM in 1979 and with severe gastroparesis for the past 10 years. Despite rigorous insulin therapy, dietary changes and the use of prokinetic medications, she struggled with frequent fluctuations in blood glucose levels and had a time in range (TIR) of only 45%. Her symptoms of gastroparesis included debilitating nausea, vomiting and early satiety, which significantly impacted her diabetes management. To manage her nausea, she also relied on granisetron patches as needed.

Intervention: The patient transitioned to the Medtronic 780G closed-loop system using Novorapid insulin for her diabetes management. Alongside this, she continued receiving intra-pyloric Botox injections every 10 weeks to help control her gastroparesis symptoms. Her care involved a multidisciplinary team that regularly evaluated her progress and adjusted her treatment plan accordingly.

Results: Over the course of two years, the patient experienced notable improvements in both her diabetes control and gastrointestinal symptoms. Her TIR increased from 45% to 78%, and she reported fewer instances of hypoglycaemia. Additionally, her haemoglobin A1c (HbA_{1c}) levels decreased from 75 mmol/mol to 55 mmol/mol, reflecting better long-term glucose management. The severity and frequency of her gastroparesis symptoms diminished significantly, leading to substantial relief from nausea and vomiting, which allowed her to reduce her reliance on granisetron patches. The implementation of the closed-loop system also contributed to a decrease in the frequency of her intra-pyloric Botox injections.

Discussion: This case illustrates the potential benefits of addition of a closed-loop system with regular intra-pyloric Botox injections

for patients facing the dual challenges of T1DM and severe gastroparesis. The approach demonstrates how technology can enhance glycaemic control while alleviating gastrointestinal discomfort.

Conclusion: By incorporating the closed-loop system, the patient experienced a reduction in the frequency of intra-pyloric Botox injections, highlighting a successful management strategy for T1DM complicated by severe gastroparesis. This comprehensive approach not only improved her TIR and overall quality of life but also improved her gastroparesis symptoms.

Category: Managing diabetes in young adults

Serial Number: 67
Submission ID: 18195

Challenges in managing a young pregnant woman with type A insulin resistance syndrome (TAIRS): a case report

Nwe Aung, Michele Mantega, Mustafa Al-ansari, Giridhar Tarigopula, Catherine Mitchell, Chukwuma Uduku, Anne Dornhorst, Yong Yong Ling

The Hillingdon Hospitals NHS Foundation Trust,
Imperial College Healthcare NHS Trust

Case report: A 17-year-old Caucasian woman G1P0 presented to the antenatal diabetes clinic at 7 weeks' gestation with HbA_{1c} 51 mmol/mol, body mass index (BMI) 26.1 kg/m², acanthosis nigricans and abdominal hirsutism. She was diagnosed with diabetes mellitus at the age of 13 and initially managed as type 1 diabetes (T1DM). Her older brother and paternal grandmother had diabetes mellitus. Her pancreatic autoantibodies were negative, and C-peptide was 1175 pmol/L. Genetic analysis revealed type A insulin resistance (TAIRS) due to a heterozygous mutation in the insulin receptor (INSR missense variant, p.Met1180Lys). She was managed on metformin and Tresiba with continuous glucose monitoring under the paediatric diabetes and national severe insulin resistance services. Her past medical history included mild learning difficulty. At booking, mealtime Novorapid was added to Tresiba (12 units) and metformin. Initial insulin-to-carbohydrate ratio was 1unit:20g, maintaining satisfactory time-in-ranges and HbA_{1c} improved to 34 mmol/mol by 22 weeks.

However, bolus insulin requirements increased dramatically after 15 weeks' gestation and by 23+4 weeks reached Novorapid 240–400 units TDS plus Tresiba 28 units. This prompted admission for monitored administration and subsequent transfer to tertiary care for glycaemic optimisation and further management. Switching to Humalog variable rate intravenous insulin infusion resulted in hypoglycaemia, without features of placental insufficiency on ultrasound Doppler. Foetal growth scans showed an estimated weight at the 82nd percentile. Insulin IgG autoantibodies were 2 mg/L (0-5). She was subsequently stabilized on 2 units Humalog with meals. At 24+4 weeks, she had spontaneous rupture of membranes and delivered vaginally. She maintained euglycemia postpartum on her pre-pregnancy

regimen. The infant was admitted to neonatal intensive care and discharged home three months later.

TAIRS is a rare disorder characterised by severe insulin resistance resulting from abnormalities in insulin receptor signalling. The physiological rise in insulin resistance during pregnancy, commonly seen from 20 weeks, appears to be augmented here, resulting in extremely high insulin requirements. The associations between hyperinsulinaemia and placental metabolism, angiogenesis and growth are complex, and the extreme hyperinsulinaemia may have contributed to her preterm labour. The marked disparity between Novorapid and Humalog doses near delivery may have represented a clinical marker for acute placental insufficiency despite normal placental tests rather than altered pharmacodynamics of different insulin analogues at the level of the mutant insulin receptor.

Conclusion: This report highlights the challenges in antenatal management in these complex cases and the importance of multidisciplinary collaboration between the patient, diabetologists and obstetricians, and reinforces the recognised relationship between falling insulin requirements in later pregnancy and placental dysfunction.

Serial Number: 44
Submission ID: 18095

A case of diabetes mellitus in a young adult: diagnostic uncertainty and challenges in management

Kyriaki Pieri

Oxford Centre for Diabetes, Endocrinology and Metabolism, Churchill Hospital, Oxford University Hospitals NHS Foundation Trust

Case report: Classification of diabetes mellitus may not be straightforward but can be more challenging, depending on patients' characteristics and wishes. We present a case of a female patient with uncertain classification of her diabetes diagnosis. This is a 25-year-old Asian female who presented with a three-month history of dizziness, weakness, lethargy, thirst, polyuria and an unintentional weight loss of 7 kg in one year. A routine HbA_{1c} of 114 mmol/mol was discovered by her GP. She was seen in hospital, where glucose of 20.7 mmol/L and ketones of 0.4 mmol/L were recorded. She had no personal history of autoimmune disease or other conditions and was not on any regular medication. She had no family history of diabetes. She was recently married, had no imminent pregnancy plans and was on contraception. On examination, she had a lean figure with no features of insulin resistance, growth hormone or cortisol excess. She was started on a basal-bolus insulin regime whilst awaiting further investigations. Subsequently, she had negative GADA, IA2, ZnT8 and islet cell antibodies, her C-peptide was 465 pmol/L and glucose 14.5 mmol/L.

Her case was discussed by the diabetes multidisciplinary team (MDT), with acknowledgement of the diagnostic uncertainty, but acknowledgement also of the need for insulin due to her low time in range. Options were addition of metformin to the existing regime or a trial of gliclazide if there were no pregnancy plans, with monitoring. The patient was reluctant to have basal-bolus

insulin and opted for gliclazide with Levemir during consultations with the diabetic nurses. When seen in diabetes clinic, she had significant time above range of 84%, with only 16% time in range. Her HbA_{1c} was 83 mmol/mol, with an average glucose of 14.9 mmol/L. Raised glucose levels were seen during fasting and around mealtimes. The patient was experiencing thrush and tiredness, and was keen to start trying for pregnancy after six months.

The diagnostic uncertainty was highlighted and the risks of pregnancy with high HbA_{1c} levels were extensively discussed, along with teratogenic effects of medications. A basal-bolus regime (Levemir and Novorapid) was re-initiated, with titration of metformin. Gliclazide was stopped. A repeat C-peptide was performed, which was lower at 364 pmol/L. The patient was also referred to preconception clinic and is under close follow-up by the diabetes clinic. With support, she accepted insulin management and acknowledged the diagnostic uncertainty, but understood the need to optimise glucose control for a healthy pregnancy and cardiovascular health.

Serial Number: 66
Submission ID: 18194

Transforming obstacles into victories: managing early-onset type 2 diabetes with new therapies

Harriet Morgan

University Hospitals of Leicester

Case report: A 38-year-old Asian woman was referred to our diabetes service in July 2024 with a diagnosis of poorly controlled type 2 diabetes (T2DM). Her HbA_{1c} was 11.4% and BMI 28kg/m². She was unaware of a family history of diabetes. She was first diagnosed with gestational diabetes at age 32 in 2018, having previously suffered an unexplained pregnancy loss. She required insulin therapy during the pregnancy. In 2020, on follow-up testing, her blood glucose levels were noted to be elevated, and she was subsequently commenced on glimepiride and metformin. Her glucose levels remained suboptimal on oral hypoglycaemic agents. She was hesitant about commencing insulin but agreed to start tirzepatide.

Three months later, her HbA_{1c} had improved to 9.4%. Although she had no immediate family plans, she was not using any highly effective method of contraception. We counselled her on the need to attain optimal glycaemic targets prior to embarking on pregnancy. She has been offered a referral to the preconception clinic if she desires a future pregnancy.

This case highlights the complexities that can arise in managing patients with early-onset T2DM. We demonstrate that providing support and offering alternative and novel treatment strategies on an individual basis can lead to improved glycaemia and positive maternal outcomes while averting adverse fetal outcomes.

Serial Number: 62
Submission ID: 18189

Hyperosmolar hyperglycaemic state (HHS) in a young adult with unclear diabetes type: a case of negative autoantibodies and normal pancreatic imaging

Suhail Abdul-Wahab, Kalyan Shekhda

Royal Free London NHS Foundation Trust

Background: Atypical presentations of diabetes in young adults can pose diagnostic challenges, especially when imaging, autoimmune markers and C-peptide levels do not align with traditional diabetes classifications. This case report details the clinical course and management of a 20-year-old male who presented with hyperosmolar hyperglycaemic state (HHS) and features inconsistent with both type 1 diabetes (T1DM) and type 2 diabetes (T2DM).

Case presentation: A 20-year-old male of Ethiopian origin presented with a one-week history of polyuria, polydipsia, fatigue, lethargy and blurred vision, and a 15 kg weight loss. He had no past medical history, did not take any regular medications, and reported smoking 6-10 cigarettes per day with occasional alcohol intake. There was no family history of diabetes. On examination, he appeared dehydrated and thin, with a BMI of 20.7 kg/m². Vital signs were within normal limits. Systemic examination was unremarkable. Initial investigations showed a venous glucose of 60.4 mmol/L and ketones of 1.8 mmol/L. His calculated serum osmolality was 322.7 mOsm/kg. Arterial blood gas measurements showed pH 7.409 and HCO₃ 23 mmol/L. His FBC, clotting, renal function, liver function and thyroid function test results were all within normal limits. His vitamin D level was 8 nmol/L (51-250). His initial HbA_{1c} was 126 mmol/mol. His C-peptide was 35 pmol/L and the paired glucose was 14.9 mmol/L. A repeat C-peptide two weeks later was 120 pmol/L, although not paired with glucose.

He was managed with IV hydration, commenced on basal-bolus insulin and given a Libre sensor. He was also loaded with 40,000 IU of colecalciferol weekly up to a total dose of 280,000 IU. His pancreatic autoantibodies (GAD, IA2, and ZnT8) returned negative twice. Subsequently, he had triple-phase CT imaging of the pancreas which did not demonstrate any abnormality. Within five weeks his HbA_{1c} came down to 81 mmol/mol. Follow-up review at 8 months and 10 months showed further improvement in his HbA_{1c} to 64 mmol/mol and 60 mmol/mol, respectively.

Discussion: This case illustrates the diagnostic challenges in classifying diabetes when typical clinical features are absent. This young patient presented with HHS but had normal pancreatic imaging and negative autoimmune markers, making T1DM unlikely. Additionally, the lack of obesity, young age and initial insulin requirement do not align with T2DM. While there is no family history to suggest monogenic diabetes or MODY, sporadic mutations are a rare possibility. Antibody-negative T1DM and latent autoimmune diabetes in adults (LADA) were also considered.

Serial Number: 52
Submission ID: 18125

A growing concern amidst limited evidence
Yu T, Moorthy M

The Royal London Hospital, Barts Health NHS Trust, London

Introduction: The incidence of type 2 diabetes (T2DM) among young people has been rising, but there is limited evidence and clinical experience regarding its management and progression in this age group. A 17-year-old White British man was referred to the young adult diabetes clinic by his GP following a recent diagnosis of diabetes mellitus. He presented with a three-week history of polyuria and polydipsia and a 1-stone weight loss. He was born prematurely at 26 weeks' gestation, and his early postnatal weeks were complicated by retinopathy of prematurity and respiratory distress syndrome. Weight gain started at the age of three years, with multiple referrals to paediatric dietary and weight management programmes. His maternal grandfather had T2DM. He is not a binge eater and has no behaviours suggestive of hyperphagia. His BMI was 34.52 kg/m² and physical examination did not reveal features suggestive of secondary obesity.

Blood tests revealed HbA_{1c} of 96 mmol/mol, dyslipidaemia, elevated ALT and raised urine albumin:creatinine ratio. Thyroid and renal function tests were within the normal range. Hepatic ultrasound showed fatty liver while a liver screen was otherwise negative. Diabetic triple antibody tests returned negative with C-peptide 2158 pmol/L, confirming a diagnosis of young-onset T2DM.

He was initiated on metformin, and dapagliflozin was added after discussion about potential side effects and sick days rule. Due to his non-compliance with medications and persistently high glucose levels, he was given a Freestyle Libre trial to see its impact on compliance. Gliclazide was added while awaiting genetic tests for diabetes, including MODY, which came back negative. He was subsequently reviewed by a multidisciplinary team with a diabetes specialist nurse, dietician and youth support worker to provide holistic support, including dietary advice and an exercise programme for weight reduction. He was commenced on tirzepatide injection given his high BMI and it was planned to stop the gliclazide on titrating the dose of tirzepatide. If his glycaemic control is not improved, insulin therapy should be considered as the next step.

Discussion: It is not uncommon for complications to be present at the time of diagnosis of young-onset T2DM. Prognosis is potentially poorer in these individuals. Young-onset T2DM is often very difficult to manage, and how can we reasonably expect young people to comply with polypharmacy? Should we be starting GLP-1 agonists earlier in these individuals? A weight reduction strategy is a part of diabetes management in young-onset T2DM. What are the best weight management strategies for the very young age group?

Serial Number: 49
Submission ID: 18122

Elevated lactate following treatment of diabetic ketoacidosis; a case of Mauriac syndrome (MS)

Saad Rasheed, Farooq Sandhu, Steven John Hunter

Not stated

Case report: A 17-year-old male with a 6-year history of type 1 diabetes mellitus (T1DM) was admitted with diabetic ketoacidosis (DKA). He had poor glycaemic control, with HbA_{1c} 100 mmol/mol, due to poor concordance with insulin. He often missed multiple insulin injections, sometimes for days in a row. He was afebrile, ketotic with Kussmaul's respiration, and his blood pressure (BP) was 121/72 mmHg. The remainder of the physical examination was unremarkable, with no hepatomegaly. Venous plasma glucose was 40.6 mmol/L, serum ketones 4.3 mmol/L, lactate 2.0 mmol/L and pH 6.92. Liver function tests (LFTs) were deranged, with Alk P 278 U/L, AST 241 U/L and Gamma GT 14 OU/L with a persistent abnormality dating back to 2018 (liver screen was negative, however).

Although ketoacidosis resolved with standard treatment to glucose 8.1mmol/L, ketones 0.4mmol/L and pH 7.31 with good tissue perfusion, he had a persisting raised lactate 3.5mmol/L. Liver ultrasound showed increased echogenicity. Lactate on discharge was 2.6mmol/L.

Discussion: Mauriac syndrome was first described in 1930 in young patients with poorly controlled T1DM who had hepatomegaly, growth retardation, delayed puberty and Cushingoid features. However, these features occur rarely in modern practice, where the sole presenting feature of Mauriac syndrome can be hepatic enlargement and/or abnormal liver function tests due to glycogen deposition in the liver. Lactic acidosis is also recognised, often after insulin treatment, suggesting a specific metabolic defect that remains to be identified. The mainstay of treatment for hepatic glycogenosis is strict control of glucose levels, with an excellent prognosis with improved glycaemic control.

Learning points:

- The features of Mauriac syndrome in modern practice are less marked than those originally described due to the availability of insulin and improved standards of diabetes care, and predominantly comprise liver enlargement and/or abnormal liver function tests due to glycogen deposition
- Mauriac syndrome, which is associated with T1DM and insulin deficiency, may be confused with non-alcoholic fatty liver disease which is more common in T2DM
- Lactic acidosis following insulin administration, independent of ketoacidosis, is well recognised
- The cause of Mauriac syndrome is unknown and no enzyme defects in glycogen metabolism have been identified
- The mainstay of treatment is strict glycaemic control.

Serial Number: 46
Submission ID: 18112

GAD to make a difference: the importance of diabetes autoantibodies and utility of virtual wards to aid diagnosis and safe discharge for people with newly diagnosed diabetes

Harry Yeuk Hei Lei, Federica Re, Elaine Hui

Northwick Park Hospital, London North West NHS Foundation Trust, London

Background: Misclassification of diabetes is not uncommon, especially with increasing atypical presentations and direct presentations to secondary care prior to developing diabetic ketoacidosis (DKA). We present a case that underscores the importance of serological testing and the utility of a diabetic virtual ward (DVW) in reducing inpatient stay while ensuring patient safety and care.

Case details: A 24-year-old man presented to his general practitioner (GP) after experiencing unintentional weight loss (10kg), fatigue, polyuria and polydipsia over two months. Originally from Pakistan, he had no prior medical conditions, weighed 64 kg, and denied family history of diabetes or autoimmune disorders.

Initial tests showed a raised random serum glucose (19.5 mmol/L) and HbA_{1c} (111 mmol/mol), prompting provisional diagnosis of type 2 diabetes mellitus (T2DM) and initiation of metformin. He was advised to attend the accident and emergency department (A&E) for further evaluation.

Upon arrival, he appeared clinically stable, with hyperglycaemia and no ketosis or acidosis. Given his age and symptoms, type 1 diabetes mellitus (T1DM) was suspected. Autoantibodies, including glutamic acid decarboxylase (GAD), insulinoma-associated antigen-2 (IA-2) and zinc transporter-8 (ZNT8), were ordered. He was started on a basal-bolus insulin regimen (Lantus 12 units ON and Trurapi 4 units pre-meals) alongside metformin. He was reviewed by the diabetes specialist nurses for education and on-boarding onto the DVW for remote monitoring and follow-up. His admission lasted less than 24 hours.

Over two weeks, the DVW optimized his glycaemic control through adjusting his insulin. The DVW also corrected misconceptions such as complete carbohydrate avoidance. His T1DM diagnosis was established through the DVW after antibody results showed positive GAD 18.0, IA-2 188, and negative ZNT8 <10.0, and he was promptly initiated on Freestyle Libre for glucose monitoring. The patient was discharged from the DVW for follow-up in the T1DM clinic.

Discussion: Misdiagnosis of diabetes type is common, especially in primary care and emergency settings where decisions are frequently based on demographic characteristics, absence of ketoacidosis and limited comprehensive testing. This case illustrates how misclassification leads to suboptimal treatment and highlights the critical role of autoantibody testing. The DVW further enabled close follow-up and real-time adjustments to this patient's regimen, optimizing glycaemic control and ultimately preventing prolonged hospitalization. There is evidence that DVWs, with remote monitoring and structured follow-up, improve patient safety and outcomes in diabetes management.¹ For complex cases like T1DM misclassified as T2DM, DVWs ensure timely intervention, education and a tailored approach in a less artificial environment, reducing readmission risk and enhancing long-term outcomes.

Reference

1. Polonsky WH, Layne JE, Parkin CG, et al. Impact of participation in a virtual diabetes clinic on diabetes-related distress in individuals with type 2 diabetes. *Clin Diabetes* 2020;**38**(4):357-62. <https://doi.org/10.2337/cd19-0105>