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Post-transplant diabetes: an audit and pilot MDT service in kidney transplantation

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Introduction and aims: Post-transplant diabetes mellitus (PTDM) causes morbidity following kidney transplantation. To reduce complications and optimise patient experience, clinicians should be proactive in managing this.

Our aim was to understand the scale of this problem and to improve diabetes care.

Methods and Results: Between 2011 and 2013, sixteen percent of 402 patients developed PTDM, and 9 % had a diagnosis of type 2 diabetes (T2DM). Both PTDM and T2DM had an increased risk of death (unadjusted HR 4.7, p<0.01 and HR 4.4, p<0.01, respectively). Kaplan Meier analysis showed these deaths occurred late after transplantation.

A multidisciplinary (MDT) transplant-diabetes service consisting of a renal dietician, a diabetologist and a nephrologist was piloted.

Fifty stable kidney transplant recipients with PTDM or T2DM were reviewed in a monthly MDT. Diabetes medication was optimised and patients triaged to a diet and lifestyle group education session, with a follow-up telephone consultation three months thereafter. Glycaemic control, body weight and patient experience data were collected.

Following intervention, median HbA_{1c} fell significantly from 65 to 58.5 mmol/mol. Fifty six percent of patients had an HbA_{1c} improvement of 5 mmol/mol or more, whereas 34% improved by 10 mmol/mol or more. Weight significantly reduced, with 44% losing 2 kg or more. Patient experience was universally positive.

Conclusions: We show a high diabetes prevalence in our kidney transplant population. We show that diabetes management can be improved, at least in the short term, through bridging the gap between specialties, in a way that patients perceive as positive.

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Real-world use of continuous glucose monitoring in type 2 diabetes and chronic kidney disease

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Introduction: Continuous glucose monitoring (CGM) has become the standard of care for people with type 1 diabetes (T1DM) and some people with type 2 diabetes (T2DM). Despite guidance from the National Institute for Health and Care Excellence (NICE) in the UK, many local integrated care systems have not yet adopted or implemented the guidance for people with T2DM. We assess the use of CGM and glucose outcomes in people with T2DM and chronic kidney disease (CKD), who are at increased risk of hypoglycaemia.

Methods: We performed a retrospective, observational analysis of adults on CGM attending a tertiary diabetes renal clinic between January 2023 and September 2024. People with T2DM on multiple daily insulin injections (defined as two or more insulin injections per day) and CKD stage 3-5 (eGFR [estimated glomerular filtration rate] <60 mL/min/1.73m^2, on renal replacement therapy or with a renal transplant) were included. HbA_{1c} was assessed pre- and post-initiation of CGM. CGM metrics were analysed for hypoglycaemia.

Results: The analysis included 147 adults. The median (interquartile range) age was 63 (57-72) years. HbA_{1c} pre- and post-CGM was 68.0 (53-79.5) and 60.3 (50-70) mmol/mol, respectively (p<0.001). HbA_{1c} reduction was observed in 99/147 participants (67.3%). Hypoglycaemia leading to an insulin dose reduction was revealed by CGM in 68/147 participants (46.2%). An additional 17 people were offered CGM, but declined.

Conclusions: CGM use was associated with improvements in HbA_{1c} and identification of hypoglycaemia in people with CKD. These real-world data are important for supporting access for people at high risk of hypoglycaemia from CKD.

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Safety and Efficacy of tirzepatide in kidney transplant patients at the Royal London Hospital

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Background : Renal transplant recipients were excluded from randomized clinical trials of tirzepatide, a novel twincretin, due to safety concerns. We reviewed the use of tirzepatide post-kidney transplant at our centre.

Method: Retrospective analysis revealed that 14 kidney transplant recipients were commenced on tirzepatide for either type 2 diabetes mellitus (T2DM) or post-transplant diabetes mellitus. Fourteen patients had 3-month follow-up and six had 6-month follow-up. At baseline 57% were female, 43% were of South-Asian ethnicity.

Results: The mean (standard deviation [SD]) change in HbA_{1c} (mmol/mol) was -11.4 (10.4), p = 0.001 at three months and -14.8 (12.8), p = 0.036 at six months. The mean (SD) change in weight (kg) was -5.6 (5.3), p = 0.001 at three months and -7.8 (7.35), p = 0.048 at six months. The mean (SD) change in BMI (kg/m^2) was -2.5 (2.37), p = 0.001 at three months and -2.65 (2.6), p = 0.057 at six months. There was no significant difference in the mean estimated glomerular filtration rates (eGFRs). The mean (SD) change in protein:creatinine ratio (mg/g) was -5.3 (35.85), p = 0.6 at three months and 0.66 (13.75), p = 0.9 at six months. One patient was unable to tolerate a higher dose of tirzepatide due to nausea and remained on the initiation dose.

Conclusion: In this small, retrospective study, tirzepatide was well tolerated in kidney transplant recipients with minimal side effects. Modest benefits in weight and glycaemic control were observed. Tirzepatide appears to be safe and effective in kidney transplant patients. However, larger studies are warranted.

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SGLT2 inhibitors (SGLT2i) in renal transplantation: real-world data

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Introduction: There are no recommendations for the use of sodium-glucose transport protein 2 (SGLT2) inhibitors (SGLT2i) post-renal transplant as there is insufficient evidence. The UK Kidney Association recommends that the use of SGLT2i should be evaluated by multidisciplinary discussion.

Aim: The aim of our survey was to look at our cohort of kidney transplant patients who are on an SGLT2i.

Methods: We evaluated data of all transplant patients registered in our network. Our centre is the referral transplant centre, with 11 referring haemodialysis centres.

Results: There were 1,672 registered patients on our network. Of these 175 had diabetes, of whom 54 (31%) were on an SGLT2i with the majority on dapagliflozin. The age range was 36 to 77 years, with median age of 61 years. The majority were patients with type 2 diabetes (T2DM). Specifically, of the 121 patients with diabetes who were not on an SGLT2i, there were eight post-transplant diabetes mellitus patients, 18 with type 1 diabetes (T1DM) and 95 with T2DM. We need to look at the number of patients who are on an SGLT2i and do not have diabetes.

Conclusion: We found that 31% of our diabetes renal transplant patients were on an SGLT2i. The follow-up outcome results of our cohort will provide real-world data on the efficacy and safety of SGLT2i. This survey highlights the current usage patterns in our unit and underscores the need for further research to establish definitive recommendations and consensus guidelines for the use of SGLT2 inhibitors in renal transplant patients.

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Use of Hybrid Closed Loop (HCL) in a person with type 1 diabetes undergoing haemodialysis and transplantation

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Glycaemic management in people with diabetes and end-stage kidney disease (ESKD) is challenging. We present a 42-year-old man who was diagnosed with type 1 diabetes (T1DM) at the age of eight and developed ESKD, requiring haemodialysis since June 2017. His past medical history included an NSTEMI (non-ST segment elevation myocardial infarction) in 2017 with stent to right coronary artery, and an extradural haematoma following a collapse due to hypoglycaemia in 2018. Due to his ischaemic heart disease he was deemed unfit for a simultaneous pancreas-kidney (SPK) transplantation, and was listed for kidney transplantation with consideration for islet after kidney transplantation. His diabetes was sub-optimally controlled, with hyperglycaemia and frequent hypoglycaemia particularly on dialysis. He had very poor hypoglycaemia awareness, with occasional severe hypoglycaemic episodes requiring third party assistance. With intensive input from diabetes nurse specialists, he improved carbohydrate counting and used Freestyle Libre glucose monitoring. While awaiting kidney transplantation, a Medtronic 780G Continuous Subcutaneous Insulin Infusion (CSII) was used with his Libre from May 2022, and upgraded to HCL with Guardian 4 sensor in March 2023. These changes resulted in improved glycaemic control, with significant reduction in hypoglycaemia. He successfully underwent an altruistic live donor transplant in August 2023. His Time in Range (TIR) improved to >80% with Time Below Range (TBR) <4% on HCL post-transplant.

Learning points: Experience of use of diabetes technology in people with diabetes and ESKD on dialysis or post kidney transplant is limited. This case shows the benefit of HCL in improving glycaemic management, especially in reducing severe hypoglycaemia in such patients.