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Short Communication

Optimising Diabetes Care for Kidney Transplant Recipients

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Abstract

Diabetes is the leading cause of end-stage kidney disease (ESKD) worldwide.

INTRODUCTION

In the UK, diabetes accounts for 30.2% of patients requiring kidney replacement therapy [1]. Kidney transplantation is considered the preferred treatment option for kidney replacement therapy. However, the emergence of post-transplant diabetes mellitus (PTDM) and exacerbation of diabetes post-transplant, presents significant challenges. After kidney transplantation, hyperglycaemia is common in individuals with pre-existing type 2 diabetes with up to 40% of patients developing de novo PTDM [2]. Identifying diabetes in the context of kidney transplantation is crucial because this group faces an accelerated diabetes complication rate and increased risks of infection, graft failure, cardiovascular complications, and mortality [2-4]. Therefore, active monitoring and proactive management of post-transplant hyperglycaemia are essential to mitigate adverse health outcomes.

There is no consensus regarding the model of care required to guide the management of diabetes mellitus and PTDM in solid organ transplant recipients. Recognising clinical gaps, we introduced a new diabetes care model for kidney transplant recipients with diabetes. This innovative model aims to address the specific needs of this population through a multidisciplinary approach, involving personalised monitoring and self-management education on lifestyle management. This approach aims to optimise glycaemic control, reduce complications, and improve overall health outcomes for kidney transplant recipients with diabetes. The paper aims to evaluate the effectiveness of this joint diabetes-renal model of care for kidney recipients with diabetes.

MATERIAL AND METHODS

This prospective audit aimed to evaluate the impact of a joint renal diabetes clinic for kidney transplant recipients with diabetes. It included patients who attended the pilot clinic between July 2020 and September 2021. The study received approval from the Royal Free London Foundation Trust's Audit Board, with the audit registration number. (RFHBU_5182122)

Data collection

Demographic and clinical data were collected from electronic patient record databases Diamond, Vital, and Cerner. Furthermore, all clinical activity data pertaining to multidisciplinary team (MDT) sessions were extracted from Cerner.

Statistical analysis

All analyses were conducted using STATA. Categorical variables are presented as percentages, while continuous variables are expressed as mean ± standard deviation. The significance of the difference in means at baseline and at the 12-month follow-up was tested using a paired samples t-test. Data regarding diabetes technology and therapies were also reported as percentages.

The audit aims:

- To determine the level of diabetes clinical care required to manage kidney transplant recipients with diabetes safely effectively and in a timely manner.
- Characterise kidney transplant recipients with diabetes who were referred to a pilot diabetes renal transplant clinic in a large tertiary hospital.

RESULT

A total of 23 kidney transplant recipients with diabetes were included in this audit. The mean age of 54.8 years (SD ± 12.6), and 54.6% were male. Most of the patients had Type 2 diabetes 59%, 36% with post-transplant-diabetes-mellitus (PTDM) while

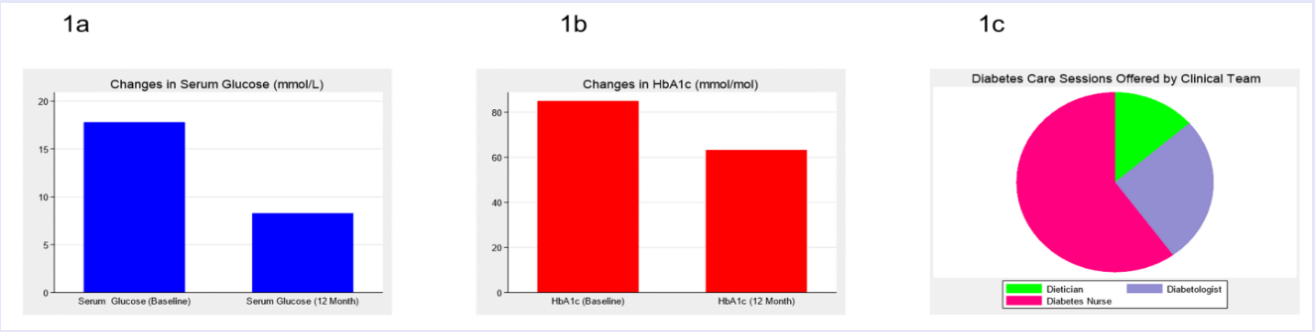

Figure 1 The mean number of MDT appointments

5%had type 1 diabetes. The primary cause of kidney failure was diabetes in 59% of patients; the ethnic mix reflected the local clinic population with a high proportion of Black ethnicity = 41%, White= 27%, and Asian =32%.

The mean serum glucose reduction was 9.3 mmol/L (17.8 mmol/L [95% CI 15.3 - 20.2] to 8.2mmol/L [95% CI, 6.9-10.0] p<0.0001; n=21). The mean HbA_{1c} reduction was 21.9mmol/mol (85.8mmol/mol [95% CI, 74.4-97.2] to 63.2 mmol/mol [95% CI, 54.9 – 73.0] p<0.0001; n=19). The mean number of MDT appointments were as follow Diabetes Nurse 3.4 (±1.1), Dietician 0.8 (±0.7) and Diabetologist 1.5 (±0.9) . The data pre- and post-pilot are presented graphically in Figure 1.

This audit demonstrated that transplant recipients with diabetes attending specialist multi-disciplinary diabetes clinics achieved measurable positive clinical outcomes. This work has characterised and mapped the workforce required to deliver this model of care.

Our findings suggest that kidney recipients may not be accessing the necessary diabetes support post-surgery, as evidenced by baseline HbA1c levels. This underscores the urgent need to implement supportive models to mitigate adverse outcomes in this population. It is noteworthy that the audit group comprised individuals with both PTDM and Type 1 diabetes, indicating the effectiveness of our model for both conditions. Furthermore, the results highlight the importance of preoperative risk stratification for individuals. Maintaining good glycaemic control in kidney transplant recipients with diabetes or individuals with reduced nephron mass is strongly associated with improved allograft survival and can help delay or even prevent the necessity of returning to dialysis or undergoing re-transplantation [5,6].

While our study holds promise, it does have several potential limitations. Firstly, its single-centre design and small sample size may restrict its external validity and broader clinical application. Nonetheless, we anticipate that similar results would be replicated in other transplant units. Another limitation pertains to the accuracy of HbA1c in assessing glycaemic status, particularly in individuals with advanced CKD or early transplantation. However, it is noteworthy that most participants exhibited elevated serum glucose levels, consistent with glycosylated haemoglobin. Additionally, our audit underscores the benefit of a holistic multidisciplinary approach to diabetes management in kidney transplant recipients. The article evaluated the number of clinical sessions required from each member of the multidisciplinary team to deliver safe and efficient care, representing the first comprehensive exploration of this aspect to our knowledge. Subsequent to the result of this audit the centre involved had implemented joint diabetes transplant model of care.

CONCLUSION

The integrated diabetes care model has shown improved glycaemic outcomes for kidney transplant recipients with diabetes. This new model has also delineated the workforce required to deliver safe and efficient care.

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