International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(CASE STUDY)

Check for updates

A Case Study on Post-Transplant Diabetes Mellitus Following Renal Transplantation

P. Visweswar Reddy [1] and Joy Kezia [2,*]

[1] *Department of Nephrology, Apollo Speciality Hospitals, Vanagram, Chennai, India.*
[2] *Chief Nursing Officer, Apollo Speciality Hospitals, Vanagaram, Chennai, India.*

International Journal of Science and Research Archive, 2026, 18(01), 839-842

Publication history: Received on 07 December 2025; revised on 21 January 2026; accepted on 24 January 2026

Article DOI: https://doi.org/10.30574/ijsra.2026.18.1.0074

Abstract

Post-transplant diabetes mellitus (PTDM), previously referred to as new-onset diabetes after transplantation (NODAT), is a common metabolic complication following solid organ transplantation. It is associated with increased cardiovascular morbidity, infection risk, graft dysfunction, and mortality. The development of PTDM is multifactorial, involving pre-existing patient risk factors and the diabetogenic effects of immunosuppressive therapy. This case study describes a 38-year-old male renal transplant recipient who developed PTDM in the early post-transplant period. The patient had a background of end-stage renal disease managed with haemodialysis prior to receiving a living donor renal transplant. Post-transplant, he experienced recurrent infections, graft dysfunction, and persistent hyperglycaemia, leading to the diagnosis of PTDM. This report highlights the clinical course, risk factors, diagnostic considerations, and management strategies, with emphasis on the nursing role in early detection, patient education, and long-term follow-up. Early recognition and appropriate management of PTDM are essential to improve patient and graft outcomes.

Keywords: Post-transplant diabetes mellitus; Renal transplantation; Hyperglycaemia; Immunosuppression; Nursing management

1. Introduction

Post-transplant diabetes mellitus (PTDM) is a significant and increasingly recognized complication among solid organ transplant recipients. It refers to the development of diabetes mellitus in individuals without a prior history of diabetes following transplantation. PTDM has been reported after kidney, liver, heart, lung, and hematopoietic stem cell transplantation, with varying incidence rates depending on the transplanted organ, immunosuppressive regimen, and patient-specific risk factors.

The condition is clinically important because it is associated with reduced graft survival, increased cardiovascular disease, higher infection rates, and overall mortality. The pathogenesis involves a combination of insulin resistance and impaired insulin secretion, often exacerbated by immunosuppressive agents such as corticosteroids, calcineurin inhibitors, and mTOR inhibitors. This case study aims to describe the development of PTDM in a renal transplant recipient and to discuss the associated risk factors, diagnosis, management, and nursing implications.

2. Epidemiology

The incidence of NODAT ranges from approximately 4% to 25% of renal allograft, 2.5 to 25% of liver transplant. 4 to 40% of heart transplant and 30 to 35% of lung transplant recipients.

* Corresponding author: Joy Kezia

The variation is due to lack of standard definition, duration of follow up, presence of risk factors and type of organ transplant.

3. Incidence

Table 1 Type of transplants

TYPE OF TRANSPLANT	INCIDENCE
New onset diabetes after transplantation	2-53%
Renal transplant	4-25%
Liver transplant	2.5-25%
Heart transplant	4-40%
Lung transplant	30-35%
HCV infected liver transplant	40-60%

4. Risk factors and causes

Table 2 Modifiable and Non Modifiable causes

Non-modifiable	Modifiable
Age > 40-45 yrs	Overweight/obesity
Recipient male gender	Pre-existing glucose intolerance HCV infection
Family history of DM	Dyslipidemia
HLA A30, B27, B42	Hypertension
HLA mismatches	
Acute rejection history	
Deceased donor	
Male donor	

5. Case Presentation

38-year-old male presented with complaints of fever with shivering, vomiting, increased frequency of micturition, sweating, and generalized fatigability.

5.1. Medical History

- Present history: Increased frequency of micturition and sweating.
- Past history: End-stage renal disease (ESRD) diagnosed in November 2023, managed with hemodialysis until May 2024.

5.2. Surgical History

Past surgical history: The patient underwent a living donor renal transplantation on 05 December 2024. The donor was his mother, categorized as an extended-criteria donor with hepatitis B carrier status.

5.3. Post-Transplant Course

- January 2025: Developed graft dysfunction with acute kidney injury and acute tubular necrosis, complicated by sepsis. Hyperglycaemia was noted during this period.
- February 2025: Recovery from acute kidney injury, followed by urinary tract infection, urosepsis, neurogenic bladder, and persistent hyperglycaemia.

- March 2025: Post-renal transplant pyelonephritis with recurrent urinary tract infections and *Escherichia coli* bacteraemia, along with continued hyperglycaemia.

Based on persistent hyperglycaemic status beyond the immediate post-transplant period, the patient was diagnosed with post-transplant diabetes mellitus.

5.4. Diagnostic Criteria

Diagnosis of PTDM was based on World Health Organization and American Diabetes Association criteria, including:

- Fasting plasma glucose ≥126 mg/dL (7.0 mmol/L), or
- Random plasma glucose ≥200 mg/dL (11.1 mmol/L) with symptoms of diabetes, or
- Two-hour plasma glucose ≥200 mg/dL during an oral glucose tolerance test.
- Glycosylated hemoglobin (HbA1c) was not used for diagnosis in the early post-transplant period due to reliability issues.

5.5. Risk Factors

The patient exhibited several known risk factors for PTDM, including:

- Non-modifiable factors:
  - Male gender
  - Age >35 years
  - History of acute rejection and infections
- Modifiable factors:
  - Exposure to diabetogenic immunosuppressive agents
  - Recurrent infections
  - Possible pre-existing glucose intolerance

Management

- Medical Management
  - Regular monitoring of fasting and post-prandial blood glucose levels
  - Initiation and titration of insulin therapy based on glycaemic status
  - Optimization of immunosuppressive regimen, including minimization of steroid dose where feasible
  - Treatment of associated infections and comorbid conditions such as hypertension and dyslipidaemia
- Nursing Management

Nursing care played a critical role in the management of PTDM:

  - Regular blood glucose monitoring and documentation
  - Patient education regarding insulin administration, diet, exercise, and medication adherence
  - Lifestyle counselling focusing on balanced diet, physical activity, and weight management
  - Monitoring for acute and chronic complications, including hypoglycaemia, infections, and microvascular complications
  - Providing psychosocial support to address emotional stress and treatment adherence

Follow-Up Care

  - Weekly fasting plasma glucose monitoring during the first post-discharge month
  - Quarterly monitoring during the first year and annual monitoring thereafter
  - Use of HbA1c for long-term glycaemic control assessment after three months' post-transplant
  - Surveillance for diabetic complications and graft function

6. Conclusion

Post-transplant diabetes mellitus is a common and serious complication following renal transplantation. This case highlights the importance of early detection, regular monitoring, and multidisciplinary management to improve patient

and graft outcomes. Nursing professionals play a vital role in screening, education, and long-term follow-up of transplant recipients at risk of PTDM.

Compliance with ethical standards

Acknowledgments

The authors acknowledge the healthcare team involved in the care of the patient.

Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of informed consent

Informed consent was obtained from the participant.,

References

[1] Sharif A, Hecking M, de Vries APJ, et al. Proceedings from an international consensus meeting on post-transplantation diabetes mellitus. *Transplantation*. 2014;97(1):38-48.

[2] Jenssen T, Hartmann A. Post-transplant diabetes mellitus in patients with solid organ transplants. *Nat Rev Endocrinol*. 2019;15(3):172-188.

[3] World Health Organization. Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia. Geneva: WHO; 2006.

[4] American Diabetes Association. Classification and diagnosis of diabetes. *Diabetes Care*. 2023;46(Suppl 1):S19-S40.