

ORIGINAL ARTICLE

Causes of hospital admission during first year post-living donor kidney transplantation: A descriptive study from a Tanzanian tertiary hospital

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ABSTRACT

Introduction: Kidney transplantation has significantly improved outcomes for patients with kidney failure. However, the first-year post-transplant remains a high-risk period for complications and hospital readmissions, particularly in resource-limited settings where specialised care is confined to a few facilities.

Methods: This was a retrospective, hospital-based cohort study conducted at Muhimbili National Hospital (MNH) to assess the causes of hospital admissions during the first year following living-related donor renal transplantation between 2017 and 2022. Data were collected from patient medical records and the MNH kidney transplant registry.

Results: A total of 72 patients underwent living-related donor kidney transplantation at MNH between 2017 and 2022. Their mean age was 45.8 years (SD $\pm$ 5.2), and the majority were male (65%). The most common underlying cause of CKD was hypertension (65%), followed by diabetes mellitus (36%). Within the first-year post-transplant, 8.3% (6/72) of patients were readmitted at least once. Indications for readmission were ureteric stenosis (n = 2), high-grade fevers (n = 2), lymphocele (n = 1), and hypoglycemia (n = 1). Patients with a history of admission had higher mean serum creatinine at 12 months ($157.6 \pm 11.2 \mu\text{mol/L}$) compared to those without admissions ($123.0 \pm 9.4 \mu\text{mol/L}$).

Conclusion: This study found a low rate of hospital admissions during the first year following living-related donor renal transplantation at the hospital. Admissions were influenced by both surgical and medical complications, with ureteric stenosis and high-grade fever being the most common causes.

Keywords: Kidney transplantation; Hospital readmission; Living donor transplantation; Post-transplant complications; Tanzania; Sub-Saharan Africa.

INTRODUCTION

Chronic kidney disease (CKD) is an increasing global health burden, especially in low- and middle-income countries (LMICs), where access to long-term renal replacement therapy (RRT) is limited [1]. Kidney transplantation is the preferred treatment for eligible patients with kidney failure, offering improved survival, better quality of life, and cost-effectiveness compared to dialysis [2,3]. In Tanzania, living-related donor renal transplantation was introduced at Muhimbili National Hospital (MNH), Dar es Salaam, in November 2017, marking a major milestone in addressing the growing burden of kidney failure [4]. Living-related donor transplants, which

offer shorter waiting times and better graft outcomes, have become the mainstay in many resource-constrained settings across sub-Saharan Africa [5].

Despite advances in immunosuppressive therapy that have significantly improved post-transplant survival, the first year following transplantation remains a critical period characterised by a high risk of complications [6,7]. Hospital readmissions are common during this time and are frequently triggered by infections, acute rejection episodes, surgical complications, and metabolic disturbances, many of which are related to immunosuppressive medications [8]. In LMICs, these risks are exacer-

Received 17 September 2025; accepted 17 July 2026; published 31 August 2026.

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bated by limited transplant infrastructure, with care often centralised in a few tertiary facilities that may lack the capacity for comprehensive post-transplant follow-up [9].

There is limited awareness and clinical experience in managing unplanned hospital visits among renal transplant recipients in SSA, which may further compromise outcomes [10]. While several studies from high-income countries and selected LMICs have examined post-transplant readmissions, data from sub-Saharan Africa remain limited, particularly from newly established transplant programmes [11]. Most available African reports focus on graft survival or overall transplant outcomes rather than detailed characterisation of first-year hospital admissions [7]. Differences in donor profiles, diagnostic capacity, and follow-up infrastructure may result in distinct hospitalisation patterns in low-resource settings. The study reported here provides context-specific data from a tertiary facility in Tanzania, contributing to the limited literature.

METHODS

Study design and recruitment of patients

This was a retrospective, hospital-based cohort study conducted at Muhimbili National Hospital (MNH) in Tanzania. The study analysed hospital admissions occurring within the first year after living-related donor renal transplantation among all patients who underwent transplant procedures between November 2017 and December 2022 at the hospital.

All transplant recipients at MNH receive a standardised immunosuppressive regimen according to institutional protocol. Induction therapy consisted mainly of anti-thymocyte globulin administered in three-quarters of patients, with the remainder receiving basiliximab. Maintenance immunosuppression primarily included tacrolimus, mycophenolate mofetil, and prednisolone, which were used in the majority (>75%) of recipients. Dose adjustments were made based on clinical status and routine therapeutic drug monitoring.

Data were retrieved from patient medical files and the institutional kidney transplant registry. A standardised data abstraction form was used to collect information on patient demographics, admission diagnoses, timing and number of hospital admissions within the first-year post-transplant, duration of hospital stay, and serum creatinine levels at the time of admission.

Statistical analysis

Data were analysed using SPSS version 24.0. Categorical variables were summarised using frequencies and percentages, while continuous variables were reported as means with standard deviations, depending on distribution.

Normality was assessed using visual inspection of histograms. Hospitalisation patterns were described based on timing (early versus late within the first year), number of admissions, and primary cause.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki. The research protocol was reviewed and approved by the Institutional Review Board of Muhimbili National Hospital, Clinical Research, Training and Consultancy Unit (reference number MNH/IRB/1/2022/061). For this retrospective cohort study, the requirement for informed consent was waived by the IRB of the MNH as the research involved the use of existing data and posed no more than minimal risk to the patients.

RESULTS

A total of 72 patients underwent living-related donor kidney transplantation at MNH between 2017 and 2022 (Table 1). The mean age of recipients was 45.8 ± 5.2 years with the majority being male (65%), employed or self-employed (54%), and having a BMI below 25 kg/m^2 (65%). Most patients were married (65%) and paid for treatment via insurance (89%). The most common underlying cause of CKD was hypertension (65%), followed by diabetes mellitus (36%).

The mean duration of dialysis prior to transplant was 14.4 ± 2.2 months. During the first-year post-transplant 6 (8.3%) patients experienced at least one hospital admission. Among those admitted, the most common reasons were ureteric stenosis (33%), high-grade fevers (33%), lymphocele (17%), and hypoglycaemia (17%). The mean serum creatinine at 12 months was higher among those with a history of hospital admission ($157.6 \pm 11.2 \text{ mmol/L}$) compared to those without admission ($123.0 \pm 9.4 \text{ mmol/L}$).

DISCUSSION

Our study provides key insights into one-year post-transplant outcomes among patients who underwent living-related donor kidney transplantation at a national referral hospital in Tanzania. The majority of recipients were male and employed, with a normal BMI, and most had CKD due to hypertension or diabetes. Within the first year, 8.3% of patients required hospital admission, most commonly due to ureteric stenosis, high-grade fevers, lymphocele, and hypoglycaemia. Patients with hospital admissions had higher mean serum creatinine at 12 months.

First-year hospital admission rates after kidney transplantation vary widely across settings and are influenced by multiple factors, including patient selection, access to care,

Table 1. Description of hospital admissions during the first year of post kidney transplantation (N=72).

Variable	N (%) or mean $\pm$ SD
Age (years)	
<35	30 (42)
36–60	34 (50)
>60	8 (12)
Mean age (years)	45.8 $\pm$ 5.2
Sex	
Male	47 (65)
Female	25 (35)
Marital status	
Single	21 (31)
Married	47 (65)
Widowed	4 (6)
Occupation	
Unemployed	14 (21)
Employed	39 (54)
Retired	10 (15)
Students	9 (13)
Mode of payment	
Paying from pocket	8 (12)
Insured	64 (89)
BMI (kg/m ²)	
<25	44 (65)
$\geq$ 25	28 (31)
Aetiology of CKD	
Hypertension	44 (65)
Diabetes mellitus	24 (36)
Hepatitis B infection	2 (2.9)
Polycystic kidney disease	2 (2.9)
Duration of RRT before transplantation (months)	
Pre-emptive transplant	2 (3)
1–6	8 (12)
7–12	30 (44)
13–24	24 (35)
25–59	8 (12)
Mean duration of RRT before transplant (months)	14.4 $\pm$ 2.2
History of hospital admission in first year	
Yes	6 (8)
No	66 (92)
Mean days of hospital stay (SD)	6.0 $\pm$ 1.7
Causes of post-kidney transplant admission (N = 6)	
Ureteric stenosis	2 (33)
High grade fevers	2 (33)
Lymphocele	1 (17)
Hypoglycaemia	1 (17)
Mean serum creatinine at 12 months post-transplant (μ mol/L)	
With admission history	157.6 $\pm$ 11.2
Without admission history	123.0 $\pm$ 9.4

integrated health information and transplant registry system, which may limit routine capture of post-discharge complications. While a low readmission rate may reflect effective surgical outcomes and follow-up care, it may also signal under-detection of complications, particularly in resource-limited settings where patients often face barriers to accessing hospital-based care. This is especially relevant given the persistent concerns around long-term graft survival in low-resource settings, suggesting that some early complications may be missed or underreported [12].

The leading causes of readmission in our cohort were ureteric stenosis and high-grade fevers, followed by lymphocele and hypoglycaemia patterns that are consistent with findings from other low- and middle-income settings [15,16]. However, the absence of more commonly reported complications such as CMV or BK virus infections may reflect limitations in diagnostic capacity in our setting [17–19]. Access to essential diagnostic tools such as viral load assays and kidney biopsy remains limited, restricting our ability to fully evaluate and manage transplant-related complications [8,20]. In contrast, post-transplant care in higher-resource settings includes routine viral monitoring and protocol biopsies, which facilitate earlier identification and treatment of complications [13].

Based on these findings, several practical strategies may help reduce early post-transplant morbidity in resource-limited settings. These include strengthening structured outpatient follow-up during the first three months after transplantation and implementing standardised clinical screening protocols for early identification of urological and infectious complications. However, these efforts must be considered within the context of limited diagnostic capacity. Improving access to essential diagnostic tools, alongside development of a national transplant registry and stronger multidisciplinary coordination, may enhance early detection and management of complications despite existing health system constraints.

This study demonstrates a relatively low rate of first-year hospital admissions following living-related donor kidney transplantation at Muhimbili National Hospital, with most readmissions attributed to urological and infectious complications. While these findings align with patterns observed elsewhere, the low admission rate and limited diagnostic detail may reflect the selective nature of the programme during its early phase. Patients were carefully chosen based on relatively low risk profiles, which may have contributed to fewer early complications.

This study adds important context-specific evidence on early post-transplant hospital admissions from a newly established kidney transplant programme in sub-Saharan Africa. However, several limitations should be considered.

and post-transplant monitoring practices [12]. Our study reported a lower first-year readmission rate compared to 53% reported in a U.S. cohort and 43.2% observed in an Indian study [13,14]. This disparity may be due to the exclusive use of living-related donors in our setting, differences in healthcare infrastructure, and the absence of an

The study was conducted at a single tertiary referral centre, which may limit generalisability. The relatively small sample size and limited number of readmission events reduced the ability to perform robust analytical assessments. Additionally, follow-up was restricted to the first-year post-transplants, precluding evaluation of longer-term outcomes.

CONCLUSIONS

This interim report on the Kenya Haemodialysis Registry demonstrates the feasibility of establishing renal registries in Africa despite the logistical challenges encountered. More robust efforts can be made to expanding the scope of renal registries by digitisation of healthcare records and establishment of standard renal patient files.

Acknowledgements

We thank the Muhimbili National Hospital for approving the research and extend our deep gratitude to the patients who participated in the study.

Funding

No funding was received for this project.

Conflict of interest

The authors have no conflicts of interest to declare.

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