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A Study on Prevalence of Renal Transplant Recipients

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Abstract

Background: Renal transplantation is the most effective treatment for end-stage renal disease (ESRD), offering improved survival and quality of life compared to dialysis. However, in Bangladesh, the prevalence of renal transplant recipients remains relatively low due to medical, economic, and infrastructural challenges. Understanding the demographic and clinical characteristics of transplant recipients is crucial for improving transplant outcomes and healthcare planning. *Objective:* This study aims to assess the prevalence, demographic distribution, primary disease causes, and co-morbid conditions among renal transplant recipients in Bangladesh. *Methodology:* A cross-sectional observational study was conducted in the Department of Nephrology at Sir Salimullah Medical College & Mitford Hospital, Dhaka, as well as at CKD and Urology Hospital and the Kidney Foundation Hospital and Research Institute, Bangladesh. A total of 105 renal transplant recipients were selected using a purposive sampling method. Data were collected using structured questionnaires, medical records, and laboratory investigations. Statistical analysis was performed using SPSS version 16, with results presented as mean ± standard deviation (SD) for quantitative data and frequency (%) for categorical data. *Results:* The majority of renal transplant recipients were aged ≤40 years (72.4%), with a mean age of 34.7 ± 8.9 years. Males predominated, with a male-to-female ratio of 7.75:1. Most patients had a normal BMI (74.3%), with a mean BMI of 21.8 ± 3.1 kg/m². The mean systolic and diastolic blood pressures were 124 ± 9 mmHg and 80 ± 6 mmHg, respectively. The primary disease leading to transplantation was undetermined in 83.8% of cases, followed by glomerulonephritis (6.7%), hypertension (3.8%), and diabetes mellitus (1.9%). Hypertension (94.3%) was the most common co-morbidity, followed by proteinuria (13.3%) and retinopathy (12.4%). *Conclusion:* Renal transplantation in Bangladesh is more common among younger males, with hypertension and glomerulonephritis being major contributors to ESRD. The high percentage of cases with undetermined primary disease highlights diagnostic limitations. Additionally, post-transplant hypertension remains a major challenge, necessitating lifelong monitoring and management. Addressing these epidemiological trends through improved diagnostic capabilities, awareness programs, and healthcare policies can enhance transplant outcomes and accessibility in Bangladesh.
Keywords: Renal transplantation, end-stage renal disease, hypertension.

INTRODUCTION

Renal transplantation is the preferred treatment for patients with end-stage renal disease (ESRD), offering improved survival and quality of life compared to dialysis. However, in Bangladesh, the prevalence of renal transplant recipients remains relatively low due to various medical, economic, and infrastructural challenges. While kidney transplantation has been performed in the country, the number of successful procedures remains limited, largely due to a shortage of donors, financial constraints, and limited access to specialized healthcare facilities [1-4].

The prevalence of renal transplant recipients in Bangladesh is influenced by a combination of factors, including the rising burden of chronic kidney disease (CKD), lack of awareness, and socio-economic disparities [5,6]. A significant proportion of patients in need of transplantation cannot afford the procedure or

post-transplant immunosuppressive therapy, making long-term graft survival a challenge. Additionally, cultural and religious beliefs often hinder organ donation, leading to a scarcity of available kidneys from living or deceased donors.

Despite these barriers, advancements in medical technology and government initiatives have contributed to a gradual increase in renal transplant cases. Leading hospitals and transplant centers in Dhaka and other major cities are expanding their capabilities, providing more opportunities for ESRD patients to receive transplants. However, the number of successful transplantations still falls short of demand, with many patients seeking treatment abroad in countries like India, Thailand, and Singapore.

Moreover, post-transplant complications, including infections, graft rejection, and medication adherence, remain significant concerns for renal transplant recipients in Bangladesh. The lack of adequate follow-up care and immunosuppressive medication affordability often leads to poor transplant outcomes. Addressing these issues requires a multi-faceted approach, including improved healthcare policies, greater public awareness, and enhanced organ donation programs.

Objective
This study aims to assess the prevalence of renal transplant recipients in Bangladesh, identify key challenges, and explore potential solutions to improve transplant success rates.

METHODOLOGY
Type of Study
This study was designed as an observational cross-sectional study to evaluate the prevalence of renal transplant recipients in selected healthcare facilities in Bangladesh.

Place of Study
The research was conducted in the Department of Nephrology at Sir Salimullah Medical College & Mitford Hospital, Dhaka, as well as at the CKD and Urology Hospital (CKD&U) and the Kidney Foundation Hospital and Research Institute, Bangladesh.

Study Period: The study was carried out over a period of 13 months, from May 2019 to June 2020.

Study Population
The target population consisted of renal transplant recipients who attended the Department of Nephrology at CKD&U and the Kidney Foundation Hospital and Research Institute, Bangladesh.

Sample Size

Thus, the estimated sample size was 368. However, due to the limited availability of renal transplant recipients and time constraints, a total of 105 patients were included in the study.

Sampling Technique
A purposive sampling method was employed. After selecting eligible participants, detailed clinical histories and medical records were collected. A structured data collection sheet was used to document relevant information, and necessary laboratory investigations were performed.

Selection Criteria
Inclusion Criteria:
- Patients aged 18 years or older
- Minimum 3 months post-renal transplantation

Exclusion Criteria:
- Patients taking lipid-lowering drugs
- Acute graft rejection within <3 months
- Patients with cognitive impairment
- Terminally ill patients

Study Procedure
Renal transplant recipients attending CKD&U and the Kidney Foundation Hospital were identified from hospital registries. Participants were contacted and scheduled for appointments. After obtaining informed consent, patients were instructed to fast for 10 hours before arriving for clinical assessment.

Each participant underwent a comprehensive medical history review, clinical examination, and laboratory investigations. The following parameters were assessed: fasting lipid profile, serum creatinine, fasting blood glucose, spot urine ACR, CRP, and eGFR (calculated using the MDRD equation). Additionally, serum Apo B, Apo A-I, and lipoprotein (a) levels were measured. The Framingham risk score was also calculated for each patient.

Data Collection Tools
A semi-structured questionnaire was designed to capture socio-demographic details, clinical information, and laboratory findings. The questionnaire was developed based on the study objectives and included structured questions for ease of data collection.

Data Management
All data were meticulously compiled, screened, and checked for completeness and consistency. Missing data and discrepancies were identified and corrected before statistical analysis.

Statistical Analysis
Data were systematically recorded using a pre-designed data collection sheet. Statistical analysis was performed using SPSS version 16 (Chicago, IL, USA).

Quantitative data were presented as mean ± standard deviation (SD), while qualitative data were expressed as frequency and percentage. Appropriate statistical techniques were applied to analyze the results.

RESULTS

Most of the renal transplant recipients were below or equal to 40 years of age(72.4%). Mean age of the RTRs was 34.7 ± 8.9 years. Males were predominant than females. Male to female ratio was 7.75:1. Most of the patients had normal weight (74.3%). Mean BMI was 21.8 ± 3.1 kg/m^2. Mean systolic BP was 124 ± 9 mmHg and mean diastolic BP was 80 ± 6 mmHg.

Table-1: Demographic profile of the Renal transplant recipients(N=105)

	Frequency (n)	Percentage (%)
Age (years)		
≤30	40	38.1
31 – 40	36	34.3
41 – 50	23	21.9
>50	6	5.7
Gender		
Male	93	88.6
Female	12	11.4
BMI (kg/m^2)		
Under weight (<18.5)	11	10.5
Normal weight (18.5 - 24.9)	78	74.3
Over weight (25.0 - 29.9)	14	13.3
Over weight (≥30.0)	3	1.9
Systolic BP(mm Hg)	124 ± 9	100 – 150
Diastolic BP((mm Hg)	80 ± 6	70 – 100

The bar chart represents the age-wise distribution of renal transplant recipients among the study population. The highest proportion (38.1%) of recipients were aged ≤30 years, followed by 31–40 years (34.3%). The percentage of recipients gradually declines with increasing age, with 21.9% in the 41–50 years category and only 5.7% in the >50 years group. This distribution suggests that younger individuals, particularly those aged 30 and below, constitute the majority of renal transplant recipients in the study, whereas older individuals are less frequently undergoing transplantation.
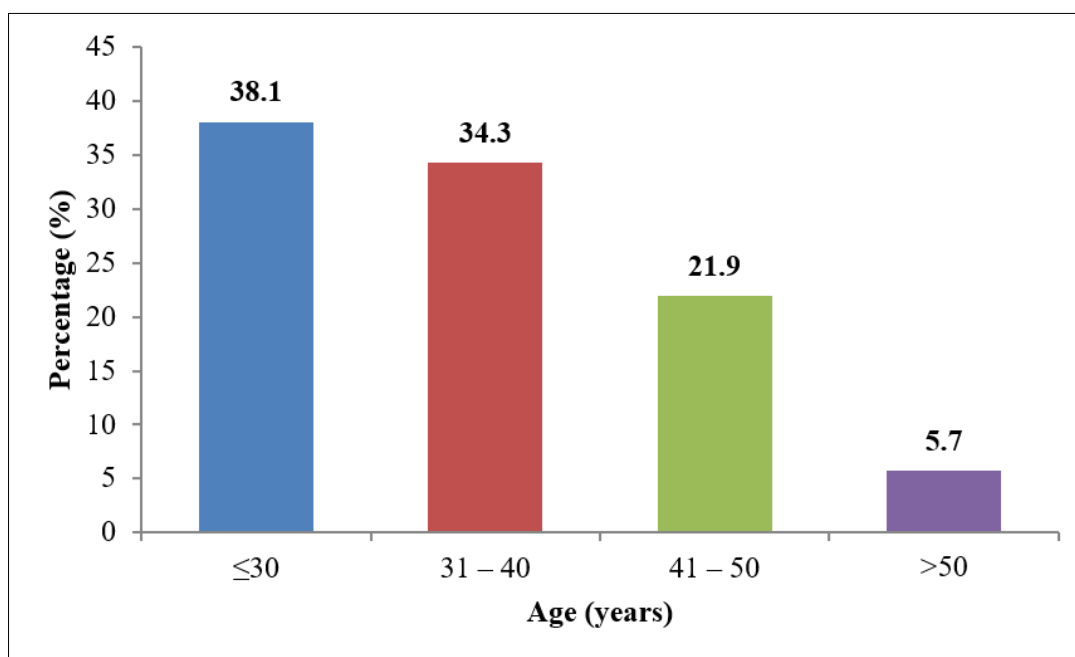

Figure 1: Distribution of Renal transplant recipients according to age N=105)

The pie chart illustrates the gender distribution of renal transplant recipients in the study population.

The majority of the recipients were male (88.6%), while only 11.4% were female. This significant disparity

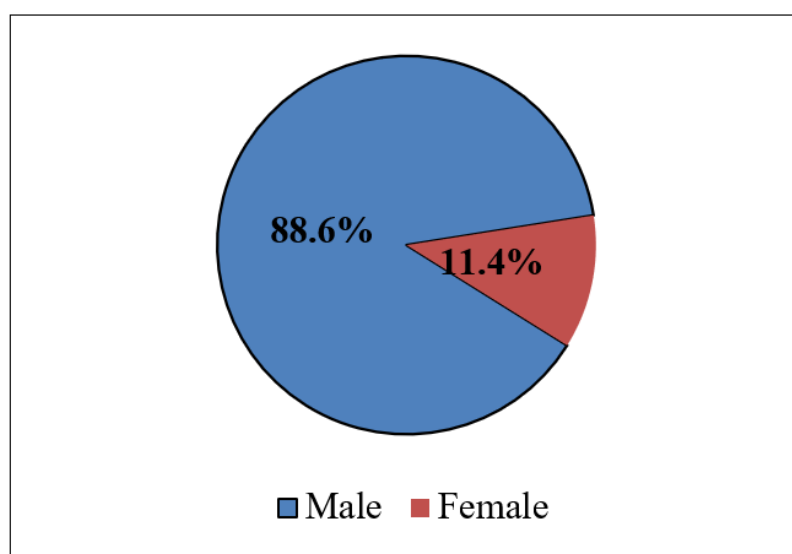suggests that men are more likely to undergo renal transplantation than women.

Figure 2: Distribution of the renal transplant recipients according to gender (n=105)

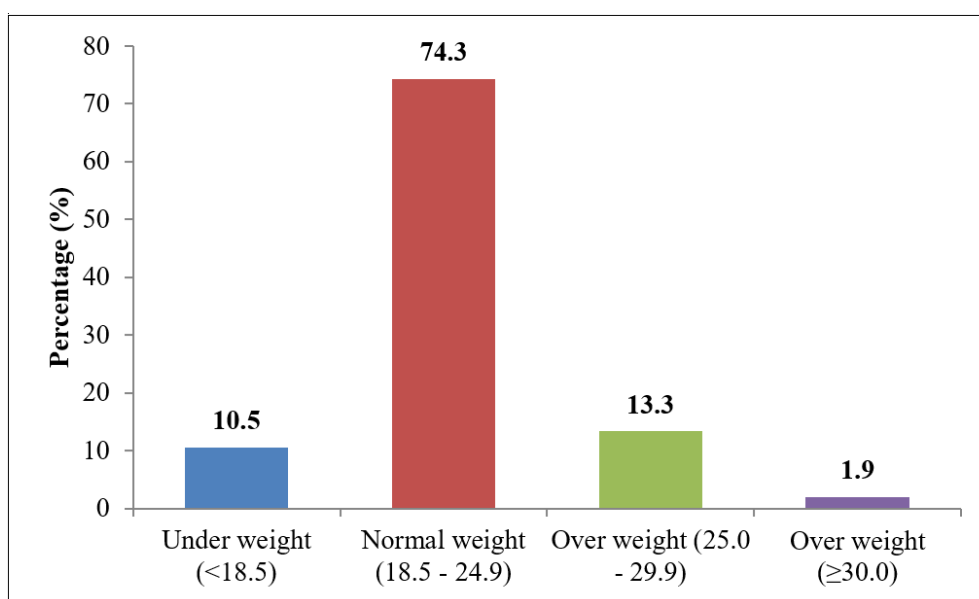Most of the patients had normal weight (74.3%). Mean BMI was 21.8 ± 3.1 kg/m2.

Figure 3: Distribution of renal transplant recipients according to BMI (n=105)

The table presents the primary underlying diseases leading to renal transplantation among the study population. The majority of cases (83.8%) had an undetermined cause of kidney failure, indicating either a lack of definitive diagnosis or late-stage presentation without proper etiological assessment. Among the identified causes, glomerulonephritis (GN) was the most common (6.7%), followed by hypertension (HTN) (3.8%) and diabetes mellitus (DM) (1.9%). Other less frequent causes included obstructive uropathy (OU) (1.0%) and renal stones (1.0%).

Table II: Primary disease of the Renal transplant recipients (N=105)

	Frequency (n)	Percentage (%)
DM	2	1.9
GN	7	6.7
HTN	4	3.8
OU	1	1.0
R. Stone	1	1.0

Undetermined	88	83.8

The table presents the prevalence of co-morbid conditions among renal transplant recipients. Hypertension (HTN) was the most common co-morbidity, affecting 94.3% of the recipients, indicating its strong association with chronic kidney disease and post-transplant complications. Proteinuria was observed in 13.3% of patients, which may suggest ongoing renal dysfunction or transplant-related complications. Retinopathy, a condition often linked to hypertension and diabetes, was present in 12.4% of the recipients. The high prevalence of these co-morbidities underscores the importance of continuous monitoring and management of cardiovascular and renal health in transplant patients to ensure better long-term outcomes.

Table III: Co-morbid disease of the Renal transplant recipients (N=105)

	Frequency (n)	**Percentage (%)**
Proteinuria	14	13.3
HTN	99	94.3
Retinopathy	13	12.4

DISCUSSION

Our study found that the majority (72.4%) of renal transplant recipients (RTRs) were aged ≤40 years, with a mean age of 34.7 ± 8.9 years, indicating that younger individuals are more likely to undergo transplantation. This finding aligns with previous studies conducted in South Asian countries, where a younger age distribution among RTRs has been reported, possibly due to a higher prevalence of glomerulonephritis and genetic predispositions leading to early-onset kidney disease.

However, studies from Western populations tend to show a higher mean age at transplantation, often above 50 years, which may be attributed to differences in healthcare access, comorbidity profiles, and cadaveric kidney transplant availability. [6] Additionally, the male predominance observed in our study (male-to-female ratio of 7.75:1) is consistent with other studies in developing countries, where socioeconomic and cultural factors may influence healthcare-seeking behavior, leading to lower transplantation rates among women [7-9]. In contrast, studies from developed nations report a more balanced gender distribution, likely due to greater healthcare equity [10].

Regarding co-morbid conditions, hypertension (94.3%) was the most prevalent, which is consistent with global trends indicating HTN as a major contributor to chronic kidney disease and post-transplant complications. The prevalence of proteinuria (13.3%) and retinopathy (12.4%) in our study further emphasizes the role of cardiovascular and metabolic disorders in post-transplant health. While the overall burden of co-morbidities in our study is comparable to findings from other Asian studies, Western reports often highlight a higher prevalence of diabetes mellitus as the primary cause of end-stage renal disease (ESRD), [11-13] whereas in our study, 83.8% of cases had an undetermined etiology. The lower frequency of diagnosed diabetic nephropathy (1.9%) in our study may reflect underdiagnosis or differences in disease patterns across populations. The variations observed between our findings and those from other regions underscore the need for tailored post-transplant management strategies considering demographic and epidemiological differences.

CONCLUSION

Renal transplantation remains a crucial treatment modality for end-stage renal disease (ESRD), with younger individuals and males being more commonly affected. The prevalence of kidney transplantation is influenced by multiple factors, including underlying disease patterns, access to healthcare, and regional disparities. Hypertension and glomerulonephritis are frequently associated with renal failure, while in many cases, the primary cause remains undetermined, highlighting the need for improved diagnostic capabilities. Additionally, co-morbid conditions such as hypertension and proteinuria play a significant role in post-transplant outcomes, necessitating lifelong monitoring and management. Understanding these epidemiological trends can help policymakers and healthcare providers develop targeted interventions to enhance early detection, improve transplant accessibility, and optimize long-term patient care.

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