Deceased Donor Renal Transplantation: Our Experience at a Tertiary Care Centre in Karnataka, India

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KEYWORDS
Deceased donor, Renal Transplantation, Cold ischemia time, Delayed graft function, acute rejection, Graft survival, patient survival

ABSTRACT

Introduction and Objective: End-stage renal disease (ESRD) causes renal failure requiring renal replacement therapies like dialysis or transplantation. [1] With the increasing incidence of diabetes, hypertension and aging population ESRD prevalence is rising [2]. In India, 1,75,000 ESRD patients are added every year out of which only 10% receive renal replacement therapy and 2.4% undergo transplantation. Due to limited live donor pool and stringent rules on unrelated donors there is a significant organ shortage. Deceased Donor Renal Transplantation (DDRT) is an effective solution for bridging the gap in demand and supply [4]. This paper presents our five-year DDRT experience (Jan 2019 – Sept 2024), analysing demographics, outcomes and various other factors highlighting the need to expand DDRT to meet rising demand of renal transplantation among ESRD patients, especially without a live related donor.

Methods: A retrospective study was done, and data was compiled and analysed of 32 recipients who underwent deceased donor renal transplantations done between January 2019 – September 2024 under the Department of Urology at our centre. Various donor and recipient characteristics were analysed with other factors affecting the outcome of deceased donor renal transplantation, postoperative complications along with graft and patient survival.

Results: The mean recipient age was 45 ± 11 years and donor age was 39 ± 12 years, with 31% of recipients and 22% of donors being female. Chronic interstitial nephritis was the primary cause of ESRD, followed by chronic glomerulonephritis. All patients received preoperative induction with anti-thymocyte globulin (ATG) and postoperative immunosuppression with a Tacrolimus-based regimen. The mean cold ischemia time (CIT) was 573 ± 217 minutes, with CIT >600 minutes showing a statistically significant association with delayed graft function (DGF) and acute rejection ($p = 0.038$). DGF occurred in 47% of patients, while acute rejection affected 18%, with antibody-mediated rejection (ABMR) as the predominant type (50%). Graft nephrectomy was required in 12.5% of cases, primarily due to ABMR. Post-transplant mortality was 18.8%, mainly due to sepsis and cardiovascular events. Patient survival rates were 76% at 1 year and 73.3% at 2 years, while graft survival was 72% at 1 year and 66.6% at 2 years. Kaplan-Meier analysis showed mean patient survival of 46.6 ± 4.8 months and mean graft survival of 51.6 ± 3.8 months.**Conclusion:** Our study highlights the effectiveness of DDRT at our centre, with favourable patient and graft survival rates. Our study also concludes that DDRT is an excellent alternative to fill the organ shortage by increasing the donor pool for renal transplantation and improve the outcome and QOL of ESRD patients especially without a live related donor awaiting transplantation.

1. INTRODUCTION

ESRD is a condition wherein the kidneys fail to adequately filter toxins and waste products from the blood, necessitating renal replacement therapies such as dialysis or transplantation [1].

In the present clinical scenario, the prevalence of ESRD is escalating, driven by factors such as diabetes mel litus, hypertension, and aging populations [2].

According to recent statistics, the incidence of ESRD has been increasing globally, with an estimated prevalence of 419 to 554 per million population in various regions, emphasizing the urgent need f or effective treatment options [3].

In India, approximately 175,000 patients are added to the end stage renal disease pool each year. However, only 10 % of these patients receive renal replacement therapy and only 2.4% of these patients receive renal transplantation [4].

The prevalence of stage 5 chronic kidney disease (CKD) in India has been reported at 0.8% and the incidence of ESRD has been pegged at 150 232 cases per million population. [4]

Renal transplantation has been identified as the best treatment that can be offered to ESRD patients in comparison to long term haemodialysis. It has also been identified the live related donor renal transplantation although offers promising results but also is insufficient in helping many ESRD patients due to the limited live donor pool.

Deceased donor renal transplantation (DDRT) and live related donor renal transplantation (LRDRT) are both critical options for patients with end-stage renal disease (ESRD). Studies have shown that both methods have comparable outcomes in terms of patient and graft survival rates [5]

Deceased donor renal transplantation (DDRT) is a critical intervention in the management of end-stage renal disease (ESRD), providing a lifeline for patients facing the irreversible decline of kidney function. [6]

Deceased donor renal transplantation (DDRT) is performed as only less than 5 % of the 3500 renal transplantations done in India per year [7].

The procedure not only alleviates the burden of lifelong dialysis for patients but also improves their quality of life and survival rates [8].

But the increasing prevalence of ESRD patients and the limited pool of live donors highlights the importance of organ donation and the need for concerted efforts to address the organ shortage crisis [9].

In Karnataka, the donation rate has shown a positive trend, with deceased donors rising from 105 in 2019 to 151 in 2022, and further to 178 in 2023 [10].

Functioning as a bridge for therapy, DDRT significantly enhances the prognosis for ESRD patients [11]. Studies have demonstrated that patients receiving transplants from deceased donors experience better long- term outcomes compared to those remaining on dialysis [12]. The procedure not only restores kidney function but also reduces the risk of cardiovascular complications, a common cause of mortality in ESRD patients [13].

Consequently, DDRT is a pivotal component of renal replacement therapy strategies, offering hope and improved health prospects for individuals grappling with the debilitating effects of ESRD and who are devoid of a live related renal donor for transplantation [14].

DDRT is a promising way to provide the best healthcare to ESRD patients to improving their prognosis, survival and the overall quality of life. Most importantly DDRT has the potential to fill the rising gap in renal transplantation in ESRD patients due to limited number of live donors and can be a lifesaving for patients who are unable to get a live donor due to various reasons.

In this study, we share our experience at our centre with deceased donor renal transplantation for end stage renal disease in the last 5 years i.e. between January 2019 to September 2024 highlighting various demographic variables along outcome.

In this paper we also highlight how deceased donor renal transplantation is the need of the hour to bridge the increasing gap between the ESRD patients and renal transplantation.

2. MATERIALS AND METHODS

Study design and Setting: A retrospective study was conducted at JSS Medical College and Hospital, Mysuru, Karnataka, India.
Study Period: January 2019 to September 2024
Study population: The study included all patients who underwent deceased donor renal transplantation at JSS Medical College and Hospital during the study period.
Inclusion Criteria: Patients ≥ 18 years of age who received deceased donor renal transplantation.
Exclusion Criteria: Patients with incomplete medical records or those who underwent multiple organ transplantation.
Data Collection: Data were collected from the medical records department of our institute. Variables included patient demographics (age, sex, BMI), clinical characteristics (cause of ESRD, comorbidities), donor characteristics (age, sex), perioperative details such as cold ischemia time and post-transplant outcomes (graft function, complications, survival rate).
Outcome measures: Primary outcome included the graft and patient survival post-transplant. Secondary outcomes included the analysis of demographic and clinical characteristics, incidence of delayed graft function and acute rejection, chronic allograft nephropathy and other post-transplant complications including graft nephrectomy and post-transplant mortality.
Statistical Analysis: Descriptive statistics were used to summarize the patient and donor characteristics. Continuous variables were expressed as mean ± standard deviation (SD) and categorical variables as frequencies and percentages. Kaplan-Meier survival curves were constructed to estimate graft and patient survival rates.
Ethical Considerations: The study was approved by the institutional ethics committee.

3. RESULTS

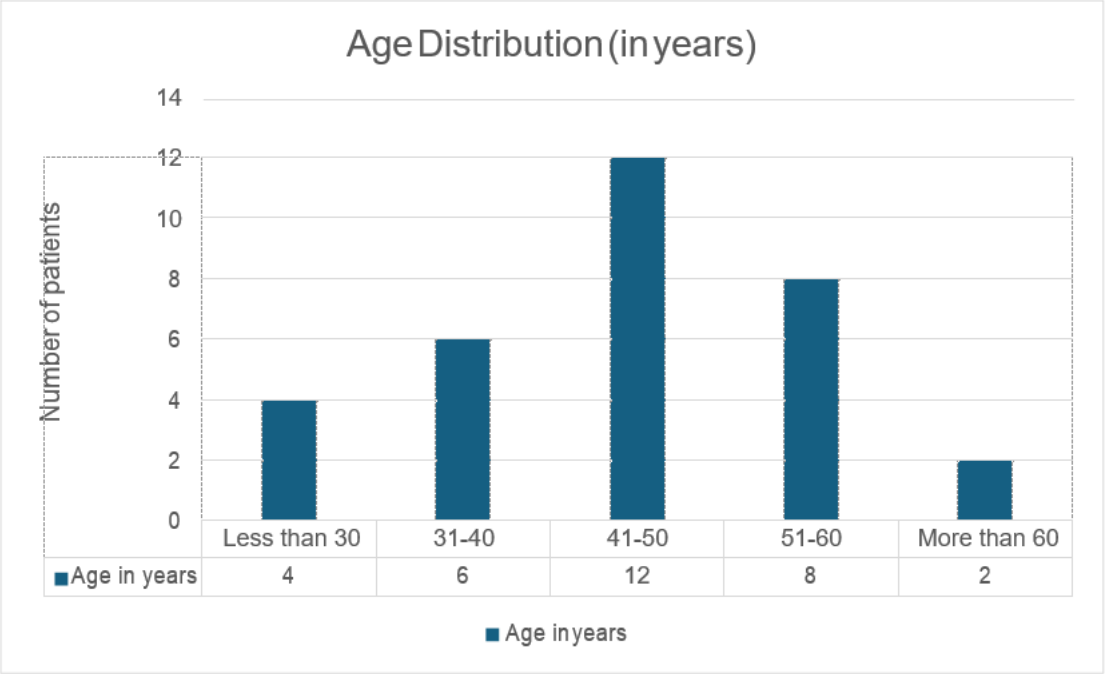
1. Patient Demographics

- **Age Distribution:**

The mean age of the patients who underwent deceased donor renal transplantation was 45 ± 11 years (range: 24-64 years).
Most of the patients were within the 40-50 age group, accounting for 39% of the total study population. This was followed by patients aged 50-60 years (25%), 30-40 years (19%), and those above 60 years (6%). The remaining 12% were aged below 30 years.

	Mean	Standard Deviation	Minimum	Maximum
Age	45	11	24	64

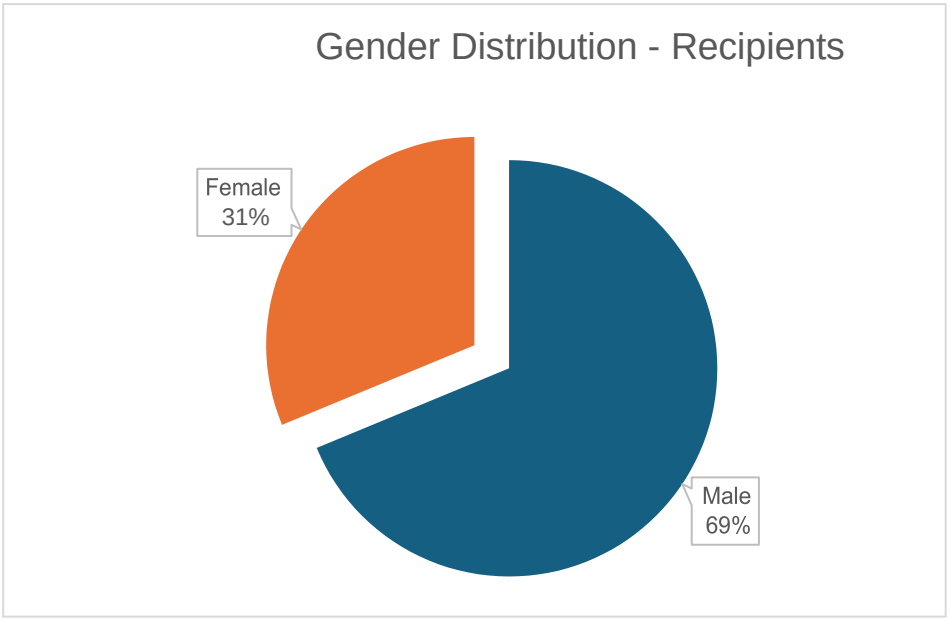
Age Group	**Number of patients**
Less than 30 years	4
31 – 40 years	6
41 – 50 years	12
51 – 60 years	8
More than 60 years	2



- **Gender Distribution**

Among the patients who underwent deceased donor renal transplantation 22 patients were male (68.8%) while 10 patients (31.3 %) were female.

		Count	Column N %
Gender	Male	22	68.8%
	Female	10	31.3%



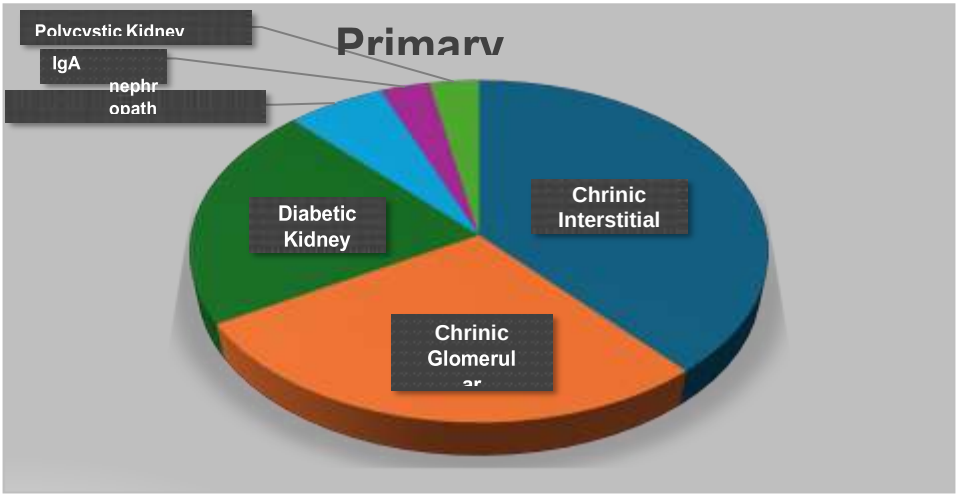
- **Body Mass Index (BMI)**

The mean BMI of the patients was 26.4 ± 3.2 kg/m^2, ranging from 18.5 to 35 kg/m^2.

2. Clinical Characteristics

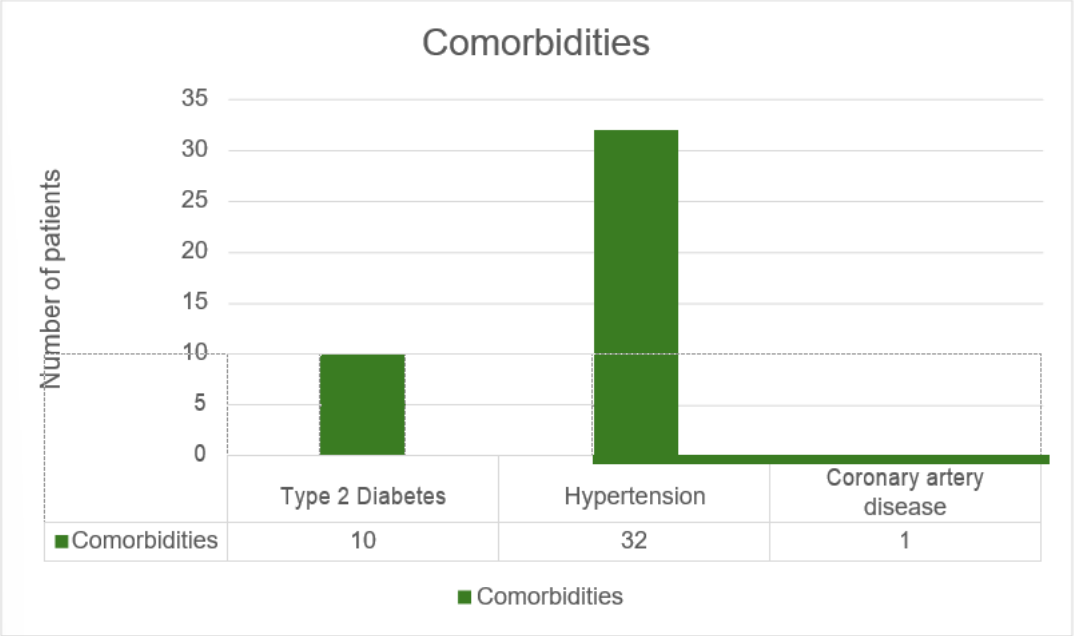
- **Primary cause of ESRD**

The most prevalent primary cause of ESRD in the patients who underwent deceased donor renal transplantation at our institute was chronic interstitial nephritis (39%) followed by chronic glomerular nephritis (28%) and diabetic kidney disease (21%)
Other causes like IgA Nephropathy, nephrosclerosis and polycystic kidney disease made up the remaining 12%.



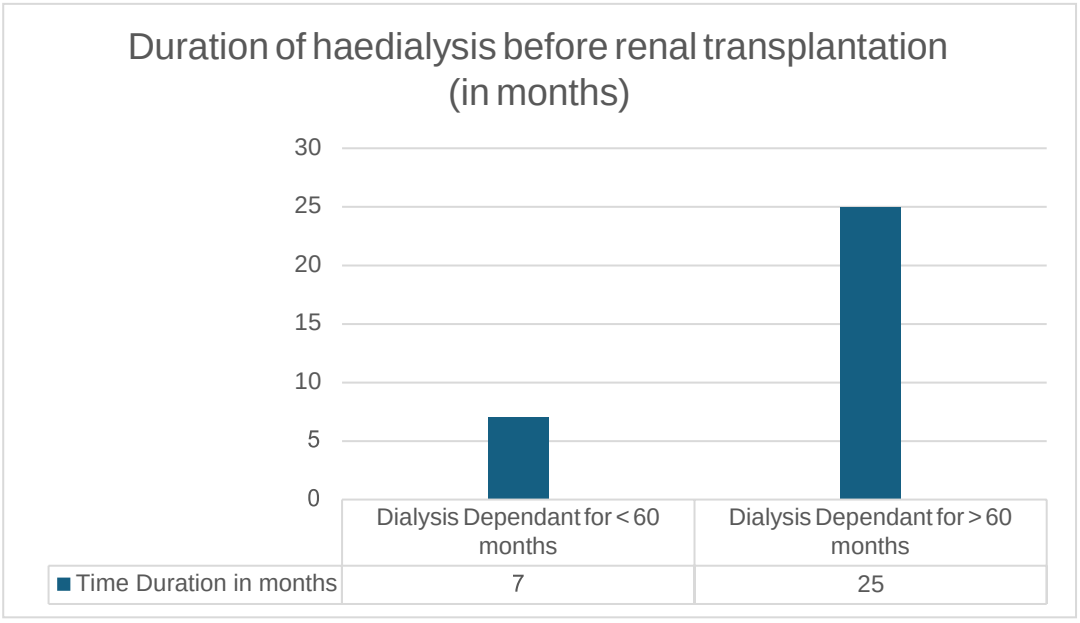
- **Comorbidities**

Among the recipients the hypertension was present in all the patients (100%). Type 2 diabetes mellitus was noted in 10 patients (31%), coronary artery disease was noted in 1 patient/s (3%).



- **Duration of ESRD dependant on haemodialysis**

Mean duration of haemodialysis dependence among the renal transplant recipients was noted to be 62 months. Range was noted between 27 months to 84 months.



Among the recipients only 7 patients (21.8%) were dialysis dependant for less than 60 months.

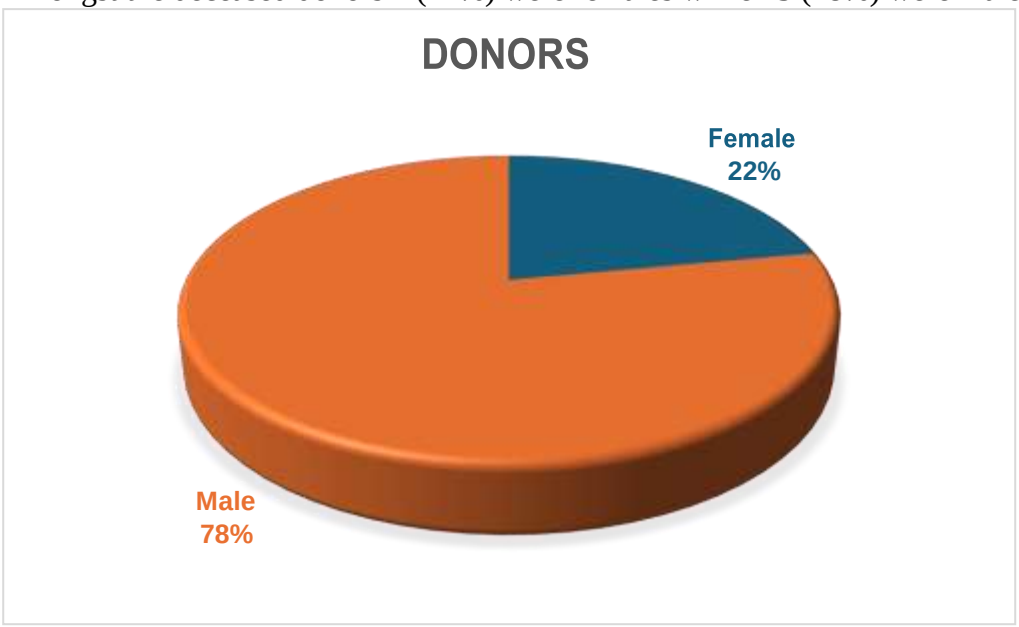
3. Donor Characteristics

- Age

The mean age of deceased donors was 39.3 ± 12.4 years. The range was 18 – 64 years of age.

- Gender

Amongst the deceased donors 7 (22%) were females while 25 (78%) were males.



4. Preoperative induction

In our institute all patients 32 patients who underwent deceased donor renal transplantation were uniformly given preoperative induction with anti-thymocyte globulin (ATG).

5. Cold ischemia time

Cold ischemia time was measured as the time from removal of kidney from the donor into the cold storage up to the time at which the blood flow was restored in the kidney after transplantation into the recipient.

The mean cold ischemia time was noted to 573.09 ± 217.71 minutes with the range between 245 minutes and 1180 minutes.

6. Postoperative Period

- **Haemodialysis**

18 (56.3%) patients who received deceased donor renal transplantation had to undergo postoperative haemodialysis.

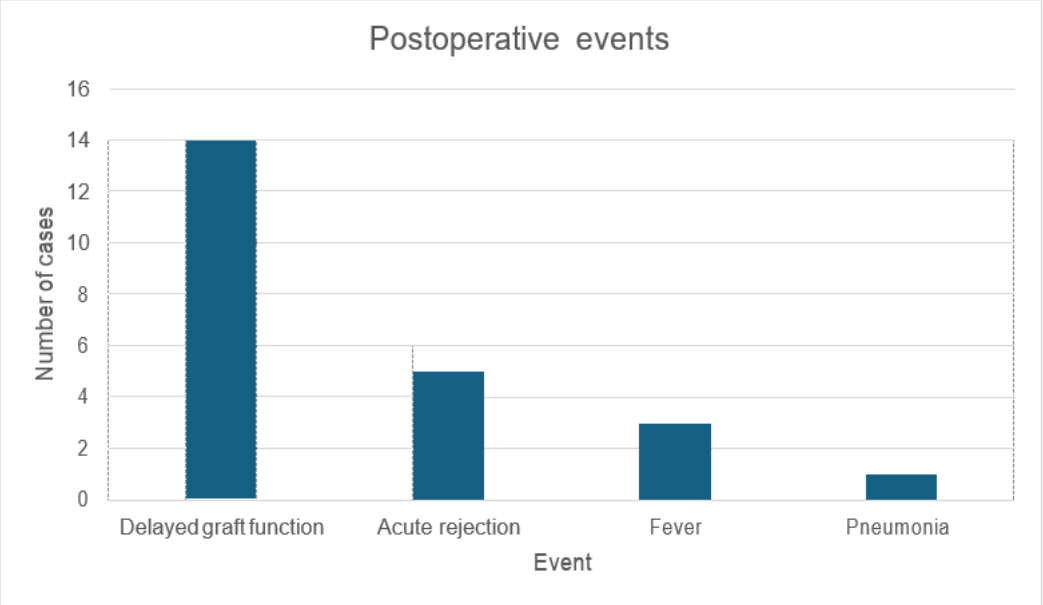
- **Postoperative immunosuppression**

All 32 patients who underwent deceased donor renal transplantation were given triple immunosuppression – TMP regimen – Tacrolimus + Mycophenolate + Prednisolone.

- **Postoperative events**

Among the recipients 14 patients (47%) had delayed graft function and required postoperative haemodialysis. A total of 4 patients (13%) had suspected acute rejection of the graft. 3 (9%)

patients developed febrile illness postoperatively and 1 patient (3%) developed pneumonia in the postoperative period.



- **Cold ischemia time and Delayed Graft Function**

We noticed that among the patients, 18 (56.2%) patients had cold ischemia time more than 600 minutes. Among these patients 9 (64%) patients had delayed graft function and 3 (16 %) patients developed acute rejection.

Effect of Cold ischemia time on delayed graft function

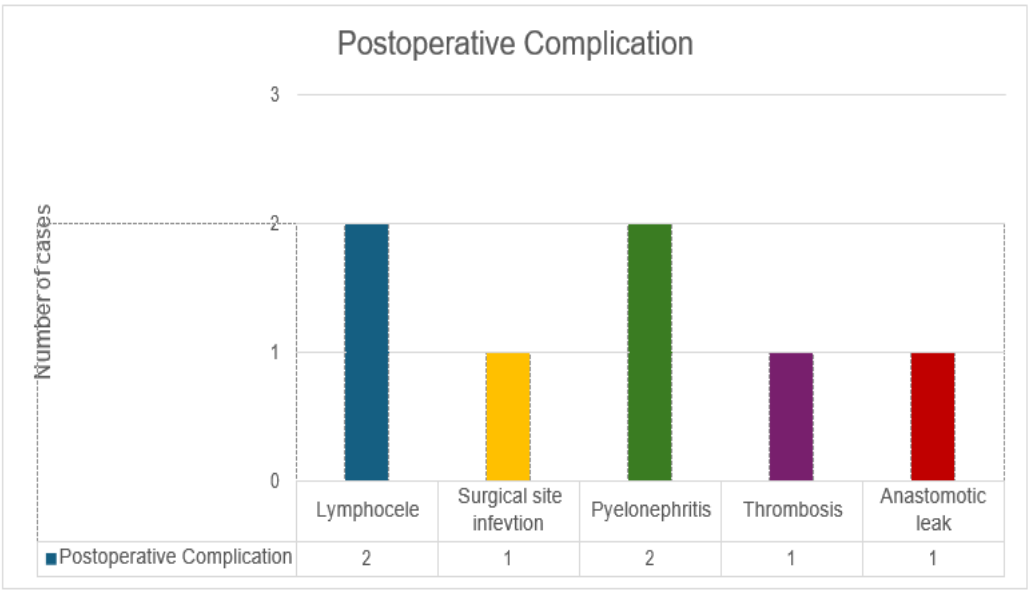
		Cold Ischemia time			
		< 600 mins (10 hrs)		>600 mins (10 hrs)	
		Count	Row N %	Count	Row N %
Event	Acute rejection	1	20.0%	4	80.0%
	Delayed graf	5	36.0%	9	64.0%

(p value = 0.038)

- **Postoperative complications**

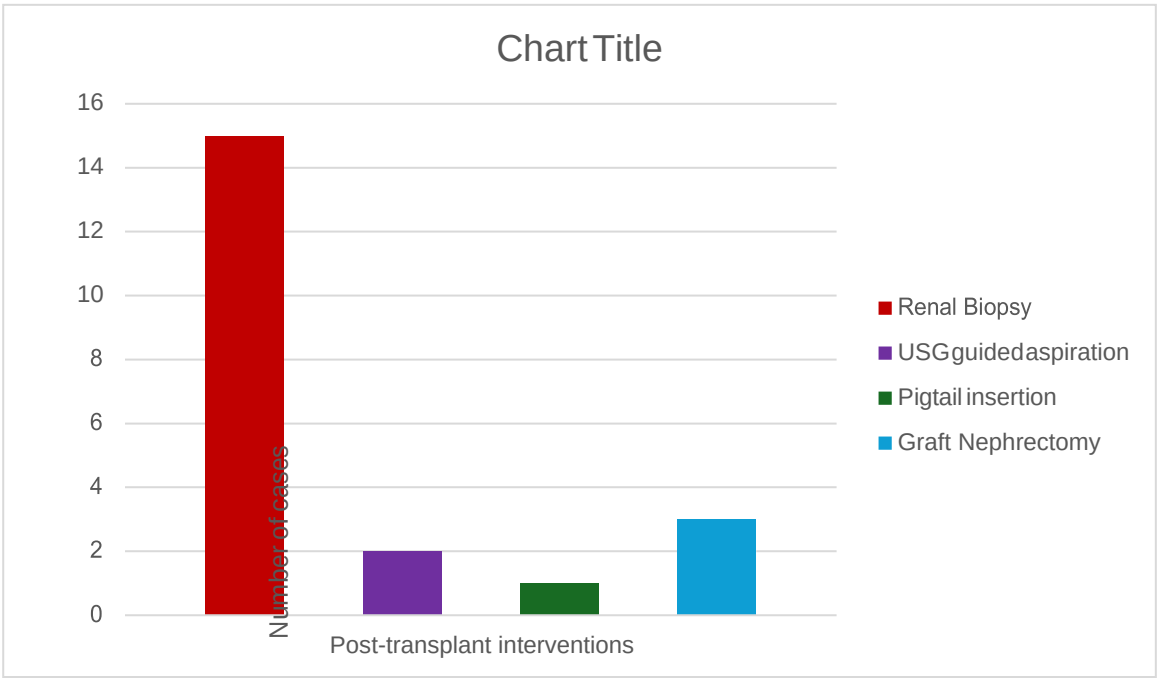
2 patients (6.25%) in the postoperative period were noted to have graft pyelonephritis. 2 patients (6.25%) had postoperative local collection near the graft i.e. lymphocele. Surgical site infection was

noted in 1 patient (3%) whereas 1 patient developed thrombosis at the anastomotic site, and another developed a leak from the anastomotic site postoperatively.



- **Post-transplantation interventions**

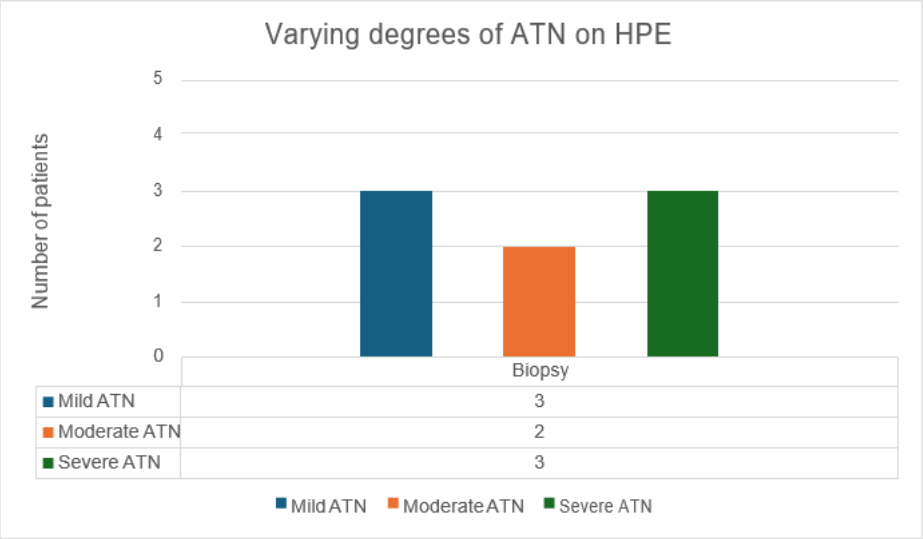
Among the transplant recipients 15 patients (46.9%) underwent renal biopsy post transplantation. 3 (9.3%) patients underwent graft nephrectomy, 2 patients (6%) underwent ultrasound guided aspiration of lymphocele out of which 1 (3%) patient underwent drainage of lymphocele by pigtail insertion.

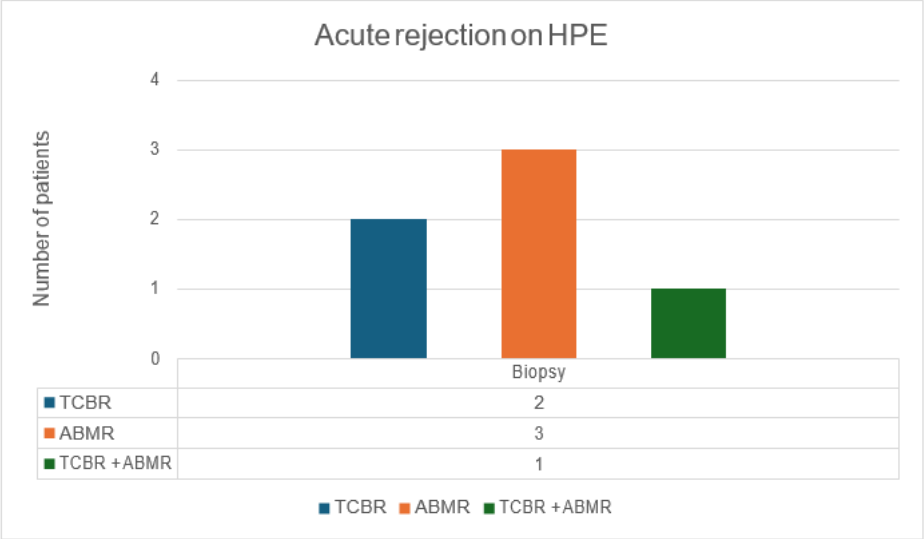


- **Renal biopsy**

A total of 15 patients (46.9 %) were subjected to postoperative renal biopsy.
As per the histopathology examination of these biopsies a total of 8 patients (25%) had varying degrees of acute tubular necrosis (ATN) Mild ATN was seen in 3 patients (9%), moderate ATN in 2 patients (6%) and severe ATN in 3 patients (9%).
Based on the histopathology reports acute rejection was diagnosed in 6 patients (18%). Out of these, T cell mediated rejection (TCMR) was noted in 2 patients (33%) and antibody mediated rejection

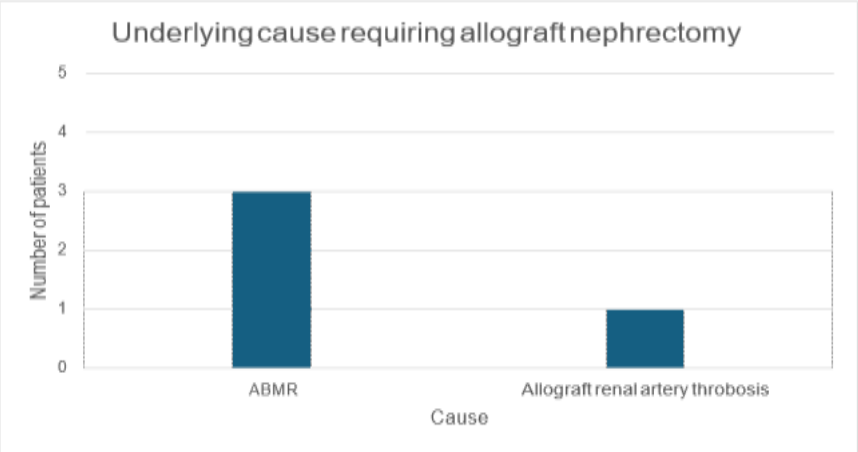
(ABMR) was noted in 3 patients (50%) and 1 patient (17%) had both TCMR and ABMR features on HPE.





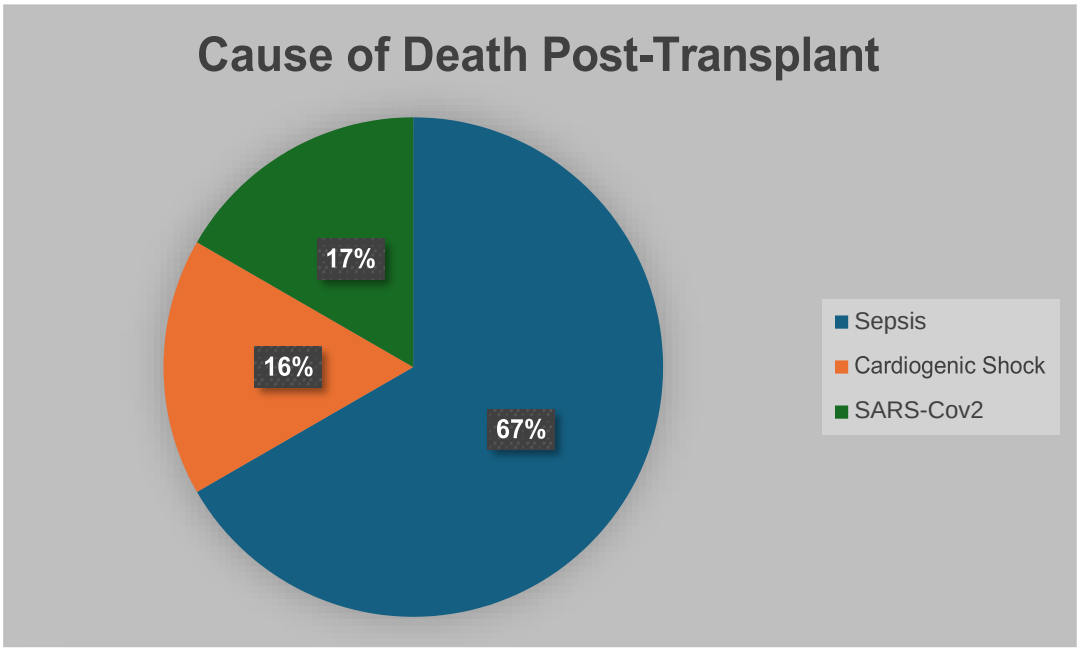
• **Graft Nephrectomy**

Out of the 32 recipients after deceased donor renal transplantation 4 patients (12.5%) required removal of the transplanted allograft. Out of these 4 patients, 3 patients (9%) underwent graft nephrectomy while one patient advised for graft nephrectomy did not give consent. The most common underlying cause identified in patients who underwent graft nephrectomy was acute antibody mediated rejection (ABMR) (75%) followed by allograft renal artery thrombosis (25%).



7. Post-transplant Mortality

Amongst the patients who underwent deceased donor renal transplantation, death was noted in 6 patients (18.8%). The most common cause of death was noted as sepsis that was seen in 4 patients (66.67%) followed by cardiogenic shock in 1 patient (16.67%) and respiratory failure secondary to SARS-CoV2 infection was noted as cause of death in 1 patient (16.67%).



8. Timing of death

All deaths in our study occurred within 6 months of the deceased donor renal transplantation. Out of these 2 deaths (33%) occurred within the first month post renal transplantation, 1 death in the third month, 2 deaths in the fourth month and 1 death in the sixth month post renal transplantation.

9. Graft Loss

Out of the 32 deceased donor renal transplantation recipients, graft loss was noted in 15.6 % patients.

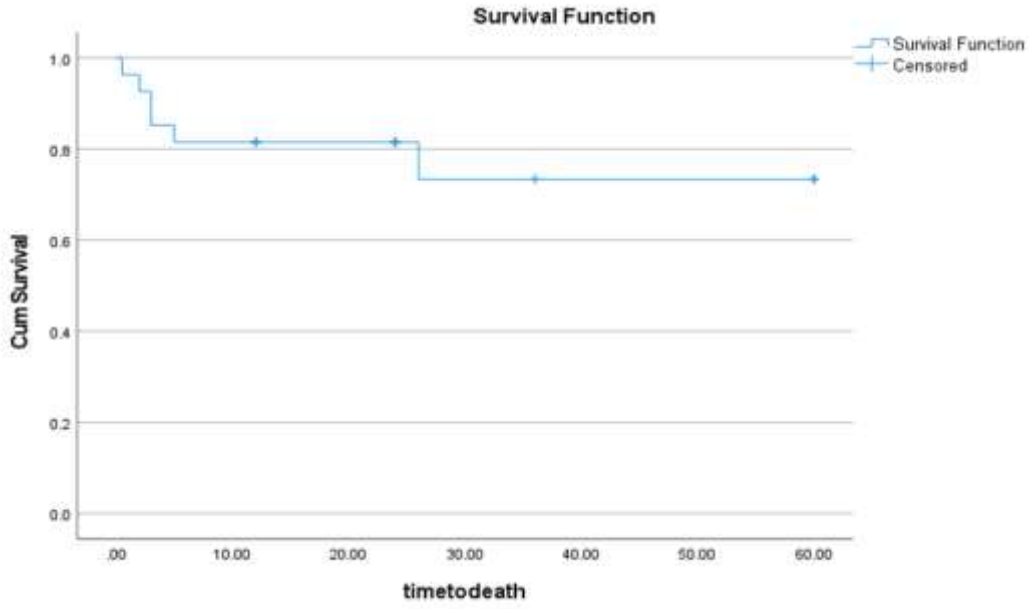
10. Patient Survival and Graft Survival

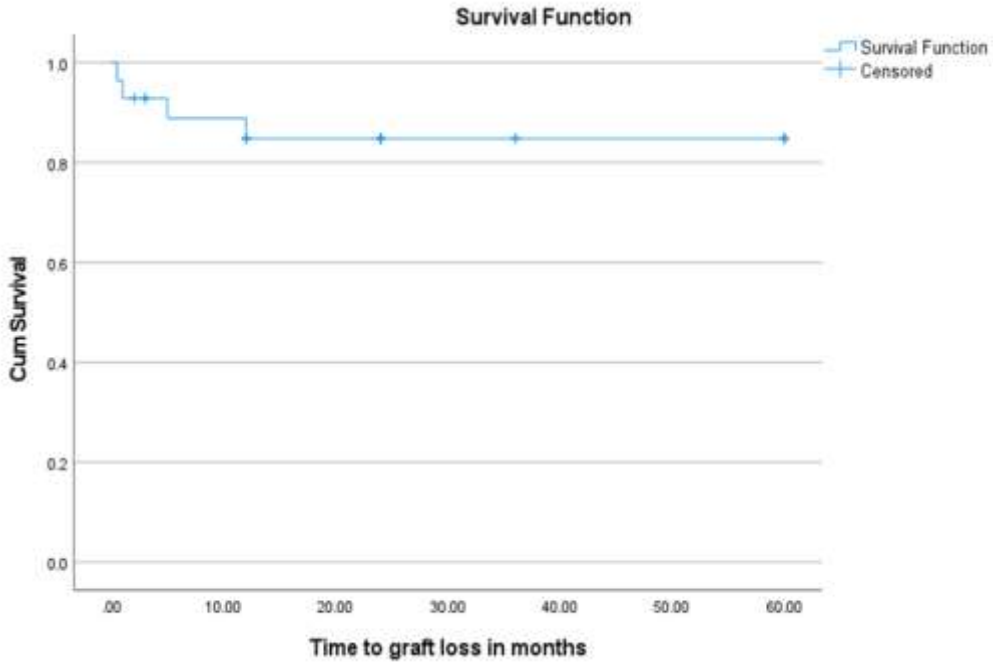
The patient survival was 76 % on 1 year and 73.3 % at 2 years. Graft survival was 72 % at 1 year and 66.6 % at 2 years.

Based on the Kaplan Meier analysis, the mean patient survival was noted 46.6 months with the standard error of 4.8 months and the mean graft survival was noted 51.6 months with the standard error of 3.8 months.

Means and Medians for Survival Time (months)							
Mean[a]				Median			
		95% Confidence Interval				95% Confidence Interval	
Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
46.619	4.812	37.186	56.051	.	.	.	.
a. Estimation is limited to the largest survival time if it is censored.							

Means and Medians for Survival Time (months)							
Mean[a]				Median			
		95% Confidence Interval				95% Confidence	
Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper
51.609	3.878	44.008	59.211	.	.	.	.
a. Estimation is limited to the largest survival time if it is censored.							





DISCUSSION

Deceased donor renal transplantation is still quite low in India despite the need and tremendous potential. With the emergence of the rising prevalence of hypertension and diabetes in India, there has been a steady increase in the ESRD cases but the donor pool for renal transplantation has remained stagnant due to stringent laws prohibiting unrelated donor transplantation at many places even today. This has created a mismatch between the demand and supply and has made "deceased donor transplant program" a compelling need of the hour.

Our institute has taken active steps in the form of increased public awareness on need of organ donation, identification of potential deceased donors, reduced transplantation cost, rapid response team capable to ensure quick preparation and support for deceased donor renal transplantation when it comes to both the donor and the recipient.

Our institute started with deceased donor renal transplantation from the end of 2018. The number of

deceased donor renal transplantations done were few initially but with time due to various efforts taken by our institute to promote and increase awareness about deceased donor renal transplant and by creating a supporting system for proper functioning, the number of donors and the numbers of cases done per year have increased, especially in the last 2 years.

The mean age of deceased donor renal transplant recipient was noted to be 45 ± 11 years. This was comparable to results of Shroff et al. [15] The mean age of donors in our study was noted to be 39 ± 12 years.

Donor age is a critical determinant of renal transplant outcomes, with older donors (≥60 years) typically associated with lower graft and patient survival rates. Research indicates that kidneys from donors with more age, exhibit reduced long-term functionality compared to those from younger donors, with younger recipients of older kidneys facing particularly high risks of graft failure [16][17].

In our study we observed that 31% of deceased donor renal transplantation recipients were female, while 22% of the donors were female. These figures align with broader trends observed in the field. For instance, a study conducted at IKDRC-ITS between 1997 and 2018 found that 32% of deceased donor kidney transplant recipients were female [18].
Saxena et al. (2024) reported a gradual increase in the percentage of female recipients from 27.57% in 2019 to 54.19% in 2023 following the implementation of a point-
based allocation system that favoured female recipients [19].

This disparity can be attributed to various factors, including biological differences, social determinants of health, and systemic biases in the allocation process [20] [21].
Globally, women account for approximately 60% of living kidney donors, driven by sociocultural norms that emphasize female roles in caregiving and familial support [22]. This trend is observed across diverse regions and socioeconomic contexts, where female donors often make this choice out of social, familial, or altruistic motivations. On the other hand, men are more likely to be recipients, mirroring patterns in our study of deceased donor transplants.

In our study the primary disease in deceased donor renal transplant recipients was noted to be chronic glomerulonephritis (38%) closely followed by chronic interstitial nephritis (31%).

These results were comparable to the results seen by Kute et al. [23] and Shivalingam et al [24]. These results suggest that CGN and CIN remain significant contributors to renal failure necessitating transplantation in the Indian context. The prevalence of these conditions highlights the importance of early diagnosis and management of glomerular diseases, which may mitigate the progression to ESRD and improve the overall transplant outcomes [24].

Yes, deceased donor renal transplantation appears to be less common among patients with diabetic kidney disease (DKD) compared to those with other causes of end-stage renal disease (ESRD). One study found that diabetic nephropathy was a primary cause of ESRD in 22.7% of deceased donor transplant recipients, highlighting that although diabetes is prevalent among ESRD patients, transplantation rates for these patients can be affected by various risk factors, including pre-existing cardiovascular disease and potential for complications [25].

In your study, the mean cold ischemia time (CIT) was noted to be 573.09 ± 217.71 minutes, ranging from 245 minutes to 1180 minutes. 18 patients had cold ischemia time more than the mean of CIT while the remaining 14 patients had CIT less than the mean CIT.

In our study we studied the effect of cold ischemia time on delayed graft function and noted that in patients with cold ischemia time more than 600 minutes the incidence of delayed graft function and

acute rejection was noted to be higher i.e. 64 % and 80 % respectively. We also noted that cold ischemia time has a statistically significant effect on delayed graft function.
(p value = 0.0389)

We also noted that the incidence of delayed graft function was higher when the cold ischemia time was more, but after Mysore becoming a nodal zone, the cold ischemia time reduced significantly which showed a decrease in the incidence of delayed graft function and acute rejection episodes as well.

Several studies support the critical role of cold ischemia time in graft function. Mogulla et al. [26] found that extended CIT significantly correlates with higher DGF rates and poorer graft survival outcomes, even when adjusting for other variables such as donor and recipient characteristics.

Debout et al. identified that CIT longer than 12 hours is associated with increased DGF, especially in deceased donor kidney transplantation [27].

In our study, we observed delayed graft function (DGF) in 43% of deceased donor renal transplant recipients and acute rejection in 13% of cases. These findings are in line with multiple studies conducted worldwide. Pérez-Sáez et al. reported DGF rates ranging between 30% and 50% in deceased donor kidney transplants, depending on factors such as donor age and cold ischemia time [28].
Similarly, a study by BMC Nephrology found a DGF incidence of around 59% in deceased donor transplant recipients, with higher rates seen in recipients with extended cold ischemia times and donors with elevated terminal serum creatinine levels [29].

Acute rejection rates in deceased donor transplants have also been consistently reported to range from 10% to 25%, depending on the immunosuppressive protocols used. Our findings of 13% acute rejection are comparable to other studies, such as those by the National Kidney Foundation, which noted a 10- 15% incidence with modern immunosuppression regimens [30]

In our study, we observed that 33% of deceased donor renal transplant recipients experienced T cell-mediated rejection (TCMR), and 50% had antibody-mediated rejection (ABMR). These results were comparable to the results by Gloor rt al. [31] who observed a significant incidence of AMR ranging between 30 % and 60 %, especially in sensitized patients or those with donor-specific antibodies [32].

Regarding TCMR, it remains a prevalent type of rejection in deceased donor transplants, with studies by Duquesnoy et al. [33] reporting incidences of TCMR in up to 20-30% of patients. These comparable results reinforce the importance of vigilant post-transplant monitoring and individualized immunosuppression strategies to minimize the risks of both TCMR and ABMR, ensuring better long-term graft survival.

In our study, the incidence of graft nephrectomy was observed to be 12.5%, which aligns with findings from another research. For example, studies have documented varying graft nephrectomy rates depending on donor and recipient characteristics, surgical complications, and the occurrence of acute rejection. A study by Marinho et al. [34] reported a graft nephrectomy rate of 10.8%, focusing on the risk factors associated with post-transplant complications, including acute rejection and ischemic damage. Another investigation by Liu et al. found similar rates, reporting an overall graft loss rate that encompassed both graft failure and nephrectomy events, largely due to acute and chronic rejection [35].

In your study, antibody-mediated rejection (ABMR) was the most common cause of graft nephrectomy, accounting for 75% of cases, followed by graft renal artery thrombosis at 25%. These findings are comparable to reports from other studies, which similarly highlight AMR as a significant

factor leading to graft failure and nephrectomy. A study by Perrottet et al. [36] reported that AMR is one of the most important causes of graft loss in kidney transplantation, with the incidence of AMR-related graft loss varying between 30% and 60% in sensitized patients. Additionally, renal artery thrombosis, though less frequent, has been identified as a serious post-transplant complication, contributing to graft loss in a notable proportion of cases, as noted by Haddad et al. [37]

In our study, with respect to post-transplant mortality, sepsis was the most common cause of death (67%), followed by cardiogenic shock (16%), these findings aligned with results from several Indian studies. Sepsis has been consistently reported as the leading cause of mortality in renal transplant recipients in India. For instance, Gopalakrishnan et al. [38] observed that infection, primarily sepsis, was responsible for the majority (87.07%) of deaths among their cohort, with cardiovascular causes contributing to a smaller percentage (11.56%). Similarly, a study published in the Indian Journal of Nephrology noted high rates of infection-related mortality, with sepsis being a key factor in post-transplant deaths [39]. Cardiovascular events, while contributing to a smaller proportion of deaths, remain a concern for long-term patient survival [40]

In our study most deaths occurred within the first 6 months of the transplantation. These findings were comparable with Mahapatra et al. who reported majority of infections and associated mortality occurred within the first four months post-transplant, a period of maximum immunosuppression, causing major morbidity and mortality [41].

In our study on deceased donor renal transplantation, we report patient survival rates of 76 % at 1 year and 73.3 % at 2 years, along with graft survival rates of 72% at 1 year and 66.6% at 2 years. These findings were comparable to the results by Gopalakrishnan et al. [38] who reported a 1-year patient survival of 80.34% and a graft survival of 82.6%. Based on this we conclude that outcome of deceased donor renal transplantation typically sees a gradual decline in both patient and graft survival rates over time due to complications like infections and rejection, which remain major contributors to post-transplant mortality and graft loss.

Our study based on the Kaplan Meier analysis showed that the mean patient survival was 46.6 months while the mean graft survival was 51.6 months. These findings were comparable to the result of Kumar et al. [42] who reported a mean patient survival of 48.7 months and a mean graft survival of 52.3 months in their cohort of deceased donor kidney transplant recipients and Bhandari et al. [43] who observed mean patient survival rates of 45.5 months and graft survival of 50.0 months in their study involving similar demographics.
These findings reinforced the comparable outcomes of deceased donor renal transplantation in our centre and highlighted the effectiveness of the same.
When comparing patient and graft survival rates in deceased donor kidney transplants with those in living donor transplants, outcomes generally favour living donors. Studies show that for living-donor transplants, the one-year patient survival rate is often around 95-97%, with graft survival at approximately 90-95%. These rates tend to remain higher over longer follow-up periods. In contrast, deceased donor transplants have slightly lower one-year survival rates, with patient survival often around 90-95% and graft survival closer to 85-90% [44].

In our study, we reported lower rates, with a one-year patient survival of 76% and a two-year rate of 73%, along with graft survival rates of 72% at one year and 66.6% at two years. These findings are lower than typical national averages and could reflect variations in donor characteristics, pre-transplant health conditions of recipients, or specific regional practices. Notably, certain factors, such as extended cold ischemia time, can impact deceased donor outcomes and may partly explain the lower survival rates observed in our study cohort.

Comparable studies emphasize that shorter cold ischemia times, typically seen in living donor

transplants, are associated with improved graft function and patient survival, particularly in the first few years post-transplant. For deceased donors, extended ischemia and potential health issues of the donor tend to decrease long-term graft viability, often necessitating closer monitoring and, in some cases, earlier interventions.

When comparing quality of life (QoL) outcomes between recipients of living-donor (LD) and deceased-donor (DD) kidney transplants, there are several notable findings. Generally, recipients of LD kidneys often report better overall QoL. These benefits are linked to fewer complications and a lower risk of rejection, as living-donor kidneys typically have shorter cold ischemia times and higher functional viability. LD recipients experience enhanced social functioning and improved psychological well-being, largely due to more predictable transplant timelines and the opportunity to avoid prolonged dialysis periods [45][46].

However, it is crucial to consider the influence of baseline health differences between these groups. LD recipients are usually healthier at the time of transplantation compared to those who receive deceased donor kidneys, which can skew comparisons unless controlled for in studies. Despite these differences, research has shown that once adjusted for factors like pre-existing comorbidities and time on dialysis, both groups can experience similar long-term improvements in health-related QoL, although LD recipients still tend to report higher satisfaction and lower stress post-transplantation due to their graft's generally better outcomes and stability over time [45] [47].

Studies like those analysed in the ATTOM programme and other longitudinal research confirm that while both transplant types significantly improve QoL compared to remaining on dialysis, the benefits are often more pronounced in LD recipients, especially in measures like vitality and social involvement. Nevertheless, guilt about the risks to the donor has been reported among some LD transplant recipients, adding a psychological complexity does not present in DD transplant scenarios [46] [47].

4. CONCLUSION

In conclusion, our study highlights the effectiveness and success of deceased donor renal transplantation at our centre, demonstrating favourable patient and graft survival rates. With a mean patient survival of 46.6 months and a mean graft survival of 51.6 months, these results underscore the potential of deceased donor transplantation as a viable and sustainable solution for patients suffering from end-stage renal disease (ESRD) who do not have a live related donor for renal transplantation.
Our results may be slightly inferior when compared to other studies which could be due to a small sample size, short follow up and various other factors.
As we strive to improve our results with deceased donor renal transplantation, we need to identify factors affecting our outcomes by performing internal audits and make adjustments and changes accordingly.

With further experience we hope of improving the overall outcome of deceased donor renal transplantation at our centre especially in terms of patient and graft survival and to give better and promising results by increasing the sample size and the median follow up time of our patients and improving the overall QOL of ESRD patients at our centre.

The increasing incidence of ESRD poses a significant challenge to healthcare systems globally, particularly in countries like India, where the demand for kidney transplants far exceeds the available living donor organs. As the burden of chronic kidney disease continues to rise, it is imperative to expand deceased donor renal transplantation programs. This approach not only addresses the immediate need for organs but also is a sustainable way to slowly overcome the increasing gap between demand and supply in terms of renal transplantation and donor organs available. Also DDRT contributes to improving the quality of life for countless patients facing the debilitating effects of renal

failure and is like a boon to the ESRD patients awaiting a renal transplant but are unable to do so due to stringent laws about organ donors and unable to find a suitable live related donor.

In today's scenario, promoting awareness about organ donation and enhancing the infrastructure for deceased donor programs is crucial. By fostering a culture of organ donation and improving transplantation practices, we can pave the way for a brighter future in renal healthcare. The potential for deceased donor transplantation to significantly alleviate the growing burden of ESRD makes it an essential strategy moving forward, offering hope and improved outcomes for patients across our nation.
Through collaborative efforts among healthcare providers, policymakers, and the community, we can ensure that the success of deceased donor renal transplantation continues to flourish, ultimately transforming the landscape of kidney care and saving lives in the process.

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