



FROM DIALYSIS TO DESIRE: ERECTILE FUNCTION BEFORE AND AFTER KIDNEY TRANSPLANTATION : A RETROSPECTIVE SINGLE-CENTRE STUDY OF LIVE AND DECEASED DONOR RECIPIENTS

Urology

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ABSTRACT

Background: Erectile dysfunction (ED) is highly prevalent in patients with end-stage renal disease (ESRD) due to hormonal, vascular, metabolic, and psychological disturbances. Kidney transplantation is expected to reverse many of these abnormalities; however, persistent ED remains a clinically relevant concern. **Objective:** To evaluate changes in erectile function before and after kidney transplantation and correlate these changes with renal function parameters. **Methods:** A retrospective observational study was conducted on 58 sexually active male kidney transplant recipients (38 live donor, 20 deceased donor) aged 18–60 years. Erectile function was assessed using the International Index of Erectile Function-5 (IIEF-5) and Quality of Sexual Function (QSF) scores pre-transplant and ≥ 6 months post-transplant through structured telephonic interviews. Renal function was assessed using serum creatinine and urea levels. Paired t-tests, Pearson correlation, and subgroup comparisons were performed, with $p < 0.05$ considered statistically significant. **Results:** Mean serum creatinine improved from 7.3 ± 3.1 mg/dL to 1.3 ± 0.4 mg/dL, and serum urea from 154.8 ± 51.6 mg/dL to 37.9 ± 10.1 mg/dL (both $p < 0.0001$). Mean IIEF-5 scores increased from 9.8 ± 4.6 to 17.5 ± 5.4 ($p < 0.0001$), and QSF scores from 25.1 ± 7.3 to 32.6 ± 8.1 ($p = 0.001$). No statistically significant differences were observed between live and deceased donor recipients. Serum creatinine showed a moderate inverse correlation with IIEF-5 scores ($r = -0.44$, $p = 0.002$). Despite overall improvement, 31.0% of patients had persistent moderate-to-severe ED post-transplant. **Conclusion:** Kidney transplantation significantly improves erectile function and biochemical parameters in most ESRD patients. Persistent ED in nearly one-third of recipients highlights the importance of structured post-transplant sexual health evaluation and management.

KEYWORDS

Erectile Dysfunction, Kidney Transplantation, IIEF-5, QSF Score

INTRODUCTION

Erectile dysfunction (ED) is one of the most prevalent and distressing complications affecting men with end-stage renal disease (ESRD), with a reported prevalence of 70–80%. The etiology is multifactorial and includes hypogonadism, endothelial dysfunction, autonomic neuropathy, uremic toxin accumulation, anemia, and psychological stress. Beyond physical impairment, ED significantly impacts quality of life, marital relationships, and mental health.

Kidney transplantation is the preferred renal replacement therapy for eligible ESRD patients, offering superior survival and quality-of-life outcomes compared with dialysis. Restoration of renal function leads to improvement in endocrine balance, clearance of uremic toxins, improved vascular health, and psychological well-being. Several studies have demonstrated partial to substantial recovery of erectile function following transplantation; however, a subset of patients continues to experience persistent ED.

This study aimed to evaluate erectile function before and after kidney transplantation using validated questionnaires and to correlate erectile outcomes with renal function parameters in a larger cohort, including both live and deceased donor recipients.

Materials and Methods

Study design and setting

A retrospective observational study was conducted at the Institute of Nephro Urology, Bengaluru, India, after approval from the Institutional Ethics Committee.

Study population

A total of 58 sexually active male kidney transplant recipients, aged 18–60 years, who underwent transplantation between January 2019 and December 2023 were included from the institutional transplant registry.

Inclusion criteria

- Age 18–60 years
- Sexually active prior to transplantation
- Minimum of 6 months post-transplant follow-up
- Availability of pre- and post-transplant erectile function assessment

Exclusion criteria

- Unmarried or not sexually active pre-transplant
- History of pelvic surgery, pelvic trauma, or psychiatric illness affecting sexual function
- Graft loss or acute rejection during the follow-up period

Data collection

Demographic and clinical data including age, etiology of ESRD, donor type (live or deceased), comorbidities (diabetes mellitus, hypertension), and immunosuppressive regimens were recorded.

Erectile function assessment

Erectile function was assessed using the IIEF-5 and QSF questionnaires administered pre-transplant and ≥ 6 months post-transplant through structured telephonic interviews conducted by the same investigator.

Renal function assessment

Serum creatinine and urea values were obtained from laboratory records closest to the erectile function assessment dates.

Statistical analysis

Data analysis was performed using SPSS version 25. Paired t-tests compared pre- and post-transplant values. Independent t-tests were used for subgroup comparisons (live vs deceased donor). Pearson's correlation coefficient assessed the relationship between renal function and erectile scores. A p -value < 0.05 was considered statistically significant.

RESULTS

Table 1. Basic demographic profile

Parameter	Overall (n=58)	Live Donor (n=38)	Deceased Donor (n=20)	p-value
Age (years), mean $\pm$ SD	42.6 $\pm$ 9.1	41.9 $\pm$ 8.7	43.8 $\pm$ 9.8	0.48
Age range (years)	21–60	22–59	21–60	–
Duration of dialysis (months), mean $\pm$ SD	26.4 $\pm$ 11.8	25.7 $\pm$ 11.2	27.6 $\pm$ 12.9	0.61

Time since transplant (months), mean ± SD	18.3 ± 7.6	17.9 ± 7.2	19.1 ± 8.4	0.57
Etiology of ESRD				
– Diabetic nephropathy	21 (36.2%)	14 (36.8%)	7 (35.0%)	0.89
Hypertensive nephrosclerosis	17 (29.3%)	11 (28.9%)	6 (30.0%)	0.93
– Chronic glomerulonephritis	12 (20.7%)	8 (21.1%)	4 (20.0%)	0.91
– Others / unknown	8 (13.8%)	5 (13.2%)	3 (15.0%)	0.84
Diabetes mellitus	23 (39.7%)	15 (39.5%)	8 (40.0%)	0.97
Hypertension	41 (70.7%)	26 (68.4%)	15 (75.0%)	0.59
Smoking history	16 (27.6%)	11 (28.9%)	5 (25.0%)	0.75
Tacrolimus-based immunosuppression	52 (89.7%)	34 (89.5%)	18 (90.0%)	0.94

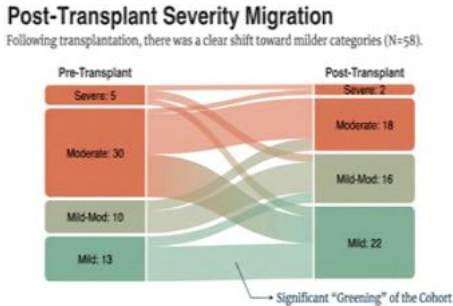
Table 2.. Pre- and Post-Transplant Changes in Biochemical and Erectile Function Parameters (n = 58)

Parameter	Pre-Transplant Mean ± SD	Post-Transplant Mean ± SD	p-value
Serum creatinine (mg/dL)	7.3 ± 3.1	1.3 ± 0.4	<0.0001
Serum urea (mg/dL)	154.8 ± 51.6	37.9 ± 10.1	<0.0001
IIEF-5 score	9.8 ± 4.6	17.5 ± 5.4	<0.0001
QSF score	25.1 ± 7.3	32.6 ± 8.1	0.001

Table 3. Erectile Function Outcomes by Donor Type

Parameter	Live Donor (n = 38) Mean ± SD	Deceased Donor (n = 20) Mean ± SD	p-value
Δ IIEF-5 score	7.6 ± 4.1	7.1 ± 4.4	0.68
Δ QSF score	7.8 ± 5.0	7.3 ± 4.7	0.74
Δ Creatinine (mg/dL)	6.1 ± 2.8	6.0 ± 3.0	0.91

Fig 1. The prevalence paradox



Overall outcomes

- Pre-transplant moderate-to-severe ED: 79.3%
- Post-transplant moderate-to-severe ED: 31.0%
- No statistically significant differences between live and deceased donor recipients

Serum creatinine demonstrated a moderate inverse correlation with IIEF-5 scores (r = -0.44, p = 0.002).

DISCUSSION

This study demonstrates a significant improvement in erectile function following kidney transplantation, as evidenced by a rise in mean IIEF-5 scores from 9.8 ± 4.6 pre-transplant to 17.5 ± 5.4 post-transplant and QSF scores from 25.1 ± 7.3 to 32.6 ± 8.1. Improvement in sexual function after transplantation is likely mediated through clearance of uremic toxins, restoration of hormonal balance, improved endothelial and vascular function, correction of anemia, and enhancement of overall psychological well-being following successful renal replacement therapy. In addition, the moderate inverse correlation observed between serum creatinine and IIEF-5 scores suggests that better graft function may contribute directly to improved erectile outcomes. The absence of a significant difference between live and deceased donor recipients further indicates that donor type itself may not substantially influence post-transplant erectile recovery, provided adequate graft function is achieved.

Despite the overall improvement, nearly one-third (31%) of patients in our cohort continued to experience moderate-to-severe erectile dysfunction after transplantation. Persistent ED may reflect irreversible vascular or neuropathic damage secondary to longstanding ESRD, metabolic comorbidities such as diabetes mellitus and hypertension, adverse effects of immunosuppressive medications, or unresolved psychosocial stressors. Our findings are comparable with studies by Yildirim Y et al., who reported improvement in mean IIEF scores from 11.2 ± 5.1 to 18.4 ± 4.7, and Mittal S et al., who observed improvement from 10.6 ± 4.8 to 17.1 ± 5.2 following transplantation. However, our study additionally compared live and deceased donor recipients and demonstrated no significant difference between the two groups, thereby providing further insight into the relationship between graft function and post-transplant sexual recovery.

Table 4 : Comparative Analysis of Erectile Function Outcomes Before and After Kidney Transplantation Across Different Studies

Study	Pre-Transplant IIEF Score	Post-Transplant IIEF Score	Persistent ED	Comment
Yildirim Y et al.	11.2 ± 5.1	18.4 ± 4.7	Reported in a subset	Similar degree of post-transplant improvement as observed in our study
Mittal S et al.	10.6 ± 4.8	17.1 ± 5.2	Reported in some patients	Comparable improvement in erectile function with persistence of ED in
Present Study	9.8 ± 4.6	17.5 ± 5.4	31% patients had persistent moderate-to-severe ED	Additionally demonstrated no difference between live and deceased donor recipients and correlation with graft function

Limitations

The retrospective design, reliance on self-reported questionnaires, and lack of objective hormonal or vascular assessments limit causal inference. Telephonic interviews may also introduce reporting bias. Future prospective studies incorporating hormonal profiling, penile Doppler evaluation, and psychological assessment are required to better elucidate mechanisms of persistent ED.

CONCLUSION

Kidney transplantation results in significant improvement in erectile function and renal biochemical parameters in most male ESRD patients, irrespective of donor type. Persistent erectile dysfunction in a substantial minority underscores the need for routine sexual health screening and targeted interventions as part of comprehensive post-transplant care.

REFERENCES

1. Palmer BF. Sexual dysfunction in men and women with chronic kidney disease and end-stage kidney disease. *Nephrol Dial Transplant*. 2010;25(2):349–357.
2. Vecchio M, Palmer SC, De Berardis G, et al. Sexual dysfunction in chronic kidney disease: a systematic review. *BMC Nephrol*. 2012;13:104.
3. Finkelstein FO, Shirani S, Wuertel D, Finkelstein SH. Therapy insight: sexual dysfunction in patients with chronic kidney disease. *Nat Clin Pract Nephrol*. 2007;3(4):200–207.
4. Yildirim Y, Tuncer M, Yildiz A, et al. Erectile function before and after renal transplantation. *Transplant Proc*. 2009;41(7):2907–2910.
5. Mittal S, et al. Sexual function in hemodialysis and renal transplant patients. *Hemodial Int*. 2013;17(2):275–281.