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**A cross sectional study of the medium term outcomes in living donor renal transplant recipients developing ATN in the immediate post transplant period**

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## **Introduction:**

Acute tubular necrosis(ATN) occurs in 20-50% recipients of deceased donor kidneys and 4-10% in living donor kidneys. There are very few studies about the outcome of the RTRs developing ATN in living donor RTRs. This study was done to study the medium term outcomes - graft and patient survival, incidence of rejections, infections and delayed graft function(DGF) in RTRs developing biopsy proven ATN in the immediate post transplant period.

## **Methods:**

Study was conducted at a tertiary care center in Eastern India. RTRs who developed ATN (biopsy proven) from January 2013 to December 2017 were included in the study. Data of these patients & respective donors was collected. Minimum period of follow-up was 5 years post-transplant. Cold and warm ischemia time, incidence of surgical complications, acute rejections, infections, graft survival , patient survival were noted. RTRs were followed up regularly in post transplant period with relevant investigations .The cohort was divided in two groups–DGF group and non-DGF group. A comparative analysis was done between the two groups. Data was analyzed using SPSS version 26.

**Table 01-Demographics**

| <b>Parameters</b>                             | <b>Values</b> |
|---|---------------|
| Recipients mean age(years)                    | 42.88±11.9    |
| Recipients mean BMI(Kg/m <sup>2</sup> )       | 23.4±2.4      |
| Male recipients(%)                            | 71.9          |
| Female recipients(%)                          | 28.1          |
| Repeat transplantation(%)                     | 7             |
| ABOi(%)                                       | 3.5           |
| ABOc(%)                                       | 96.5          |
| Dialysis vintage <1y(%)                       | 40.4          |
| Dialysis vintage ≥1y(%)                       | 59.6          |
| Mean WIT(mins)                                | 28.47±9.86    |
| Mean CIT(mins)                                | 36.72±14.05   |
| Total ischemia time(mins)                     | 65.4±21.14    |
| HLA mismatch <3/6(%)                          | 15.8          |
| HLA mismatch ≥3/6(%)                          | 84.2          |
| Mean discharge creatinine(mg/dl)              | 2.65±1.19     |
| Mean follow up creatinine(mg/dl)              | 1.9±1.19      |
| Mean Post-transplant duration ( years)        | 6.3±1.35      |
| Mean Hospital stay (immediate period) in days | 26±10.18      |

**Cont.....Table 01-Demographics**

| <b>Parameters</b>   | <b>Values</b> |
|---|---------------|
| Mean graft survival time (years)                            | 8.86±0.097    |
| Mean patient survival time (years)                          | 7.97±0.23     |
| Mean graft survival time (years)in DGF with rejection       | 6.2±          |
| Mean graft survival time (years)in DGF without rejection    | 6.3           |
| Mean patient survival time (years)in DGF with rejection     | 6.3           |
| Mean patient survival time (years)in DGF with out rejection | 6.6           |
| Donors mean age(years)                                      | 44±8.4        |
| Donors mean BMI(Kg/m <sup>2</sup> )                         | 22.2±1.05     |
| Male Donors(%)  | 15.8          |
| Female Donors(%)  | 84.2          |
| Donors LK nephrectomy(%)                                    | 87.7          |
| Donors RK nephrectomy(%)                                    | 12.3          |
| Donors kidney multiple arteries(%)                          | 21.1          |
| Donors kidney multiple veins(%)                             | 3.5           |

**Table 02-Comparative outcomes of DGF and Non DGF**

| <b>Outcomes</b> | <b>DGF(N=12)</b> | <b>non- DGF(N=45)</b> | <b>P VALUE</b> |
|-----------------|------------------|-----------------------|----------------|
| AMR             | 2/12(16.7%)      | 6/45(13.3%)           | 0.67           |
| ACR             | 1/12(8.3%)       | 4/45(8.9%)            | 1              |
| AMR+ACR         | 2/12(16.7%)      | 2/45(4.4%)            | 0.192          |
| CAN             | 3/12(25%)        | 1/45(2.2%)            | 0.03*          |
| INFECTIONS      | 7/12(58.3%)      | 11/45(24.4%)          | 0.04*          |
| GRAFT LOSS      | 2/12(16.7%)      | 0/45(0%)              | 0.04*          |
| DEATH           | 4/12(33.3%)      | 10/45(22.2%)          | 0.46           |

## Results

57 RTRs developing ATN were included. Male /female ratio was 2.56 :1. Mean age of recipients was  $42.88 \pm 11.9$  years. Mean warm ischemia time was  $36.72 \pm 4.05$  minutes, cold ischemia time was  $28.47 \pm 9.86$  mins and **total ischemia time was  $65.40 \pm 21.14$  mins.** Mean duration of hospital stay in the immediate post-transplant period was  **$25.82 \pm 10.2$  days.** Mean duration of follow up was  $6 \pm 1.8$  years. 84% of donors were female and mean age of donors was  $43 \pm 8.5$  years. 12.3% of donors underwent right kidney nephrectomy and 87.7% underwent left kidney nephrectomy. **21.1% of donor kidneys had multiple arteries. Surgical site bleeding was seen in 50.9%. 29.8% of recipients had acute rejections. 7% developed chronic allograft nephropathy (CAN). 31.6% developed infections. Patient survival was 75.4% at follow up and mean survival time was 7.98 years. Graft survival was 96.5% and mean graft survival time 8.86 years. 21.05% developed DGF. Patient survival in DGF and non DGF group was 67% and 78% respectively. Graft survival in DGF and non-DGF group was 84% and 100% respectively (statistically significant). 2 out of 12 DGF patients lost their graft. Significant association of DGF with CAN, infections and graft loss.**

# **Conclusion**

**DGF secondary to ATN in the immediate post transplant period adversely affects the graft outcomes in medium term. The incidence of infections, CAN and graft loss is significantly higher in DGF group compared to non-DGF group.**