OUTCOMES OF PRE-EMPTIVE RENAL TRANSPLANTATION COMPARED TO TRANSPLANTATION POST-DIALYSIS: A PAEDRIATRIC PERSPECTIVE

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INTRODUCTION

- Kidney transplantation is the optimal treatment for end stage kidney disease in paediatric patients. Most recipients undergo a duration of maintenance dialysis prior to transplantation. **Transplantation performed without initiation of dialysis is defined as pre-emptive transplantation (1).**
- For children who are maintained on dialysis **adverse effects on growth, anaemia, cardiovascular disease, and overall lifespan** of patients is well documented (2). However, the benefits of circumventing dialysis are unclear. One study showed that there was no significant difference between pre-emptive and dialysed patients in terms of patient and allograft survival (3).
- In contrast, Amaral et al (2016) have illustrated that pre-emptive transplantation is associated with considerable benefits in patient and graft survival particularly when compared to children who's dialysis exceeded a length of 12 months (4).

AIM

Compare the 4 year outcomes of pre-emptive and dialysed patients transplanted between 2003-2019.

METHODS

- One-hundred and thirty-eight transplants were carried out since 2003. Data was available on **120 transplants, preformed on 114 patients** (6 patients were re-transplanted).
- Outcomes examined include serum creatinine levels, eGFR, rejection episodes (i.e. acute cell mediated/ antibody mediated) and graft loss. **Data was collected from the day of transplant, 3 months, 6 months, 1yr, 2yrs, 3yrs and 4yrs post transplantation**. Data was analyzed using Statistical Package for Social Science (SPSS) v24.0. Independent Samples t-test and Chi-Squared test of Independence were conducted.

RESULTS

	Total Transplants (n=120)	Pre-emptive Group (n=28)	Dialysed Group (n=92)	P Value
Age (y)	16±5.71	17±4.89	15±5.97	0.098
Male/ Female (%)	78 (65%)/ 42 (35%)	24(86%)/ 4(14%)	54 (59%)/ 38 (41%)	**0.011**
Deceased Donor	69 (57.5%)	18 (64.3)	51 (55.4)	0.407
Living Related Donor	51 (42.5%)	10(35.7)	41 (44.6)	0.407
Cold Ischemia Time (hr)	7.63±7.087	7.78±7.80	7.59±6.93	0.925
Donor Age (y)	31.50±11.65	32.52±11.60	31.18±11.60	0.632
BMI SDS at Transplant	0.11±1.19	0.19±1.12	0.09±1.12	0.759
BMI SDS at 4y Post -Tx	0.196±0.98	0.05±1.09	0.24±0.96	0.643
Height SDS at Transplant	-2.12±1.49	-2.065±0.89	-2.14±1.64	0.802
Height SDS at 4y Post -Tx	-1.30±1.61	-1.40±1.62	-1.27±1.64	0.841
Creatinine (µmol/l) at Tx	430.636±244.63	351.88±121.48	455.24±267.81	**0.009**
Creatinine (µmol/l) at 4y	118.35±172.57	88.63±27.00	130.54±203.72	0.418
eGFR at Transplant	19.92±22.51	19.79±17.91	19.96±23.90	0.973
eGFR at 4y Post-Tx	80.45±38.87	89.84±44.07	76.84±38.124	0.287
CKD at Transplant	96/103 (93%)	24/25(96%)	72/78(92%)	0.523
CKD at 4y Post Tx	8/66 (12%)	0/13 (0%)	8/53 (15%)	0.077

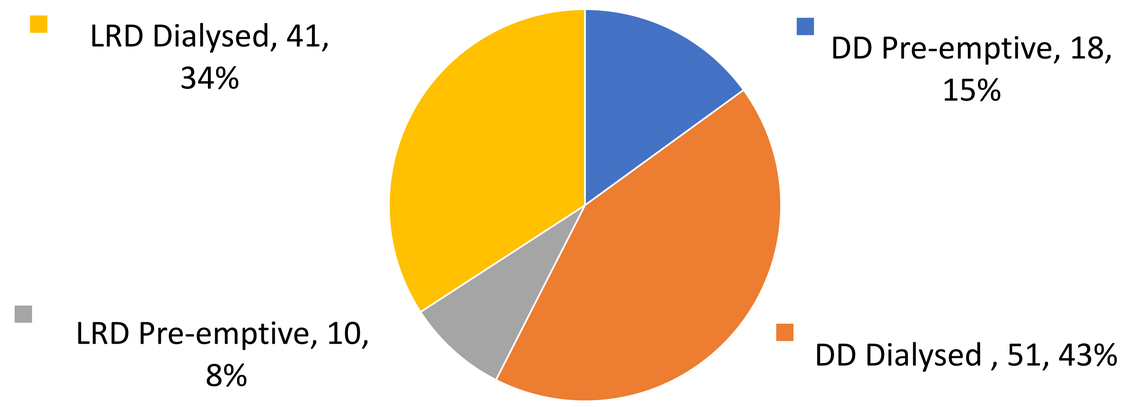
P-Values highlighted in bold signify statistical significance. BMI SDS: Body Mass index standard deviation score. Height SDS: Height standard deviation score. Tx: Transplant eGFR: estimated glomerular filtration rate. CKD: Chronic kidney disease.

KEY FINDING

There does not appear to be a significant difference between the outcomes of pre-emptive and dialysed patients

RESULTS

The Percentage of Pre-emptive and Dialysed Patients Transplanted



DD: Deceased Donor, LRD: Living Related Donor

- **Of the 120 transplanted evaluated, 28 were pre-emptive (23%) and 92 were conducted post-dialysis (77%).**
- Pre-emptive patients were more likely to have elevated creatinine at 1yr post transplant compared to the dialysed group (37% v 14%; p=0.021), however at 2yrs, 3yrs and 4yrs this difference was not significant.
- There was no difference in eGFR (p=0.418) or CKD stage (i.e. 1-5) (p=0.815) at 4yrs post transplant between the two groups.
- The number of rejection episodes in the dialysed and pre-emptive groups (13% v 21%, p=0.227), and graft loss at 4yrs was similar for (10% v 0.5%, p=0.327).
- **Deceased or living related donor allografts did not affect this outcome**.
- Dialysed patients were **more likely to require antihypertensives at 6 months (p=0.022) and 1yr (p=0.028) post transplant**, however this difference was not significant at 4yrs post-transplant (p=0.5).
- At 1yr post transplant 64% of pre-emptive and 29% of dialysed patients had anaemia (p= 0.010), however at **4yrs post transplant this was not statistically significant**.
- Dialysis length (>12m) (p=0.278,) and HLA match (p=0.200) did **not affect creatinine levels 4yrs post-transplant**.
- There were 2 episodes of graft loss at 4yrs, one from a pre-emptive patient with a good HLA (<3 mismatches) match and one from a dialysed patient with a bad HLA match (>3 mismatches).

RESULTS/DISCUSSION

- This **study found no significant difference** between the outcomes of pre-emptive and dialysed patients. Studies conducted on a similar cohort and sample size of patients found equivalent outcomes (5). These institutional studies **could be limited by sample size** as larger national analysis have found superior outcomes in pre-emptive patients. For example, Butani *et al* analysed 3606 paediatric kidney transplants, 28% of which were pre-emptive (n=1003), and found the 1yr acute rejection rate was lower in the pre-emptive group (p=0.008). (6)
- Further studies conducted on a larger cohort of patients may provide more insight into the benefits of pre-emptive transplantation. However, **bypassing maintenance dialysis avoids the morbidities associated with dialysis,** such as cardiovascular disease, and **ensues improved quality of life** for patients. (7)

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