Retrospective analysis of pediatric renal transplant biopsy data in Ireland:
A 15 year review

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Introduction

• Renal transplantation is the first choice in treatment of pediatric patients with end stage renal disease.
• Renal biopsies are a well-established tool in assisting diagnostic decisions and treatment plans for renal diseases; this study will provide an analysis of patients who have undergone one or more targeted renal biopsies.

Aim

• To profile both therapeutic and graft outcomes in post-transplant patients who have undergone a renal biopsy in a national single center in Ireland.

Methods

• A retrospective review of 138 renal transplants from 2003-2019 was analyzed.
• Patients who underwent at least one renal biopsy at Temple Street Children’s University Hospital were included.
• Data collected: demographic data, clinical indications, lab values, biopsy and histological findings.
• Data analysed via Microsoft Excel 2019 and SPSS v26
• The Human Research Ethics Committee approved this project

Results: Patient Population Characteristics

*The following figures are representative of all 43 initial biopsies

<table>
<thead>
<tr>
<th>Patient Demographics Table</th>
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<tbody>
<tr>
<td>Male, n (%)</td>
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<tr>
<td>Female, n (%)</td>
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<tr>
<td>Median age at Transplant (tx) (years)</td>
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<tr>
<td>Median age at 1st Biopsy (bx) (years)</td>
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<td>Median (days) between tx and bx</td>
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Table 1. Biopsy patient demographics

Underlying Diagnosis of Patients needing a Renal Biopsy, n=43

- Dysplasia: 33%
- Hemolytic Uremic Syndrome: 21%
- Reflux Nephropathy: 9%
- Branchio-Oto-Renal Syndrome: 5%
- Focal Segmental Glomerulosclerosis: 9%
- Posterior Urethral Valve: 12%
- Congenital Nephrotic Syndrome: 5%
- Other: 5%

Figure 1. The most predominant being dysplasia (33%). The “Other” category consists of renal agenesis, obstructive uropathy, polycystic kidney, Alport’s syndrome, etc.

Donor Specific Antibody (DSA) Values in Antibody-Mediated Rejection (AMR) and Non Antibody-Mediated Rejection after Biopsy, n=43

- Antibody-Mediated Rejection
  - Below 1500: 30%
  - Above 1500: 10%
- Non Antibody-Mediated Rejection
  - Below 1500: 30%
  - Above 1500: 10%

Figure 4. Patients with DSA values above 1500 and 3000 were more likely to have an antibody-mediated rejection diagnosis post first biopsy (P=0.071)

Results: DSA and Proteinuria

• Two patients with a biopsy diagnosis of antibody-mediated rejection had DSA values above 3000.
• Proteinuria values for these patients at time of biopsy had a median of 321mg/L (range: 104-538) and continued to rise with four years post biopsy data displaying a median of 1924mg/L (range: 1328-2520).
• Two patients with (antibody-mediated rejection with DSA values within range (below 1500) had a median proteinuria value of 580.5mg/L (range: 610-551) taken at biopsy and continued to decline with a value of 139.5mg/L (range: 60-219) after four years.

Conclusions

• Renal transplantation in pediatric patients has delivered similar results when compared to other single center experiences.
• This study provides data on the epidemiology of renal disease in paediatric Irish patients and can be helpful in formulating guidelines in the future.

Next Steps

• A long term follow up study of outcomes comparing centers use of biopsy results is recommended.
• Larger studies examining the efficacy DSA values as well as assessing proteinuria and long term graft function are warranted.

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