INFECTIONS IN THE FIRST YEAR AFTER LIVER TRANSPLANT IN PAEDIATRICS AT WDGMC

Mary Duncan
Transplant coordinator
About the study

• Infection rates and causative agents

• Paediatric liver and liver/kidney transplants

• 65 children with 69 transplants

• 2005 to 2014 with 1 yr follow up

• Ethics approval from Wits HREC (M160257)
Presentation

• Results from this study

• Compare these to international findings

• Improve clinical practice
## Results: Demographics

<table>
<thead>
<tr>
<th>Category</th>
<th>Paediatric recipients (n=69) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>27 (39)</td>
</tr>
<tr>
<td>female</td>
<td>42 (61)</td>
</tr>
<tr>
<td><strong>Population group</strong></td>
<td></td>
</tr>
<tr>
<td>black</td>
<td>35 (51)</td>
</tr>
<tr>
<td>white</td>
<td>24 (35)</td>
</tr>
<tr>
<td>indian</td>
<td>5 (7)</td>
</tr>
<tr>
<td>mixed</td>
<td>4 (6)</td>
</tr>
<tr>
<td>asian</td>
<td>1 (1)</td>
</tr>
<tr>
<td><strong>Sector</strong></td>
<td></td>
</tr>
<tr>
<td>private</td>
<td>63 (91)</td>
</tr>
<tr>
<td>public</td>
<td>6 (9)</td>
</tr>
<tr>
<td><strong>Median age at transplant</strong></td>
<td>49 months (IQR 27 – 152m)</td>
</tr>
</tbody>
</table>
Results: Recipient age
Results: Recipient weight

The median weight at transplant was 13.9 kg (IQR 9.4-28.0 kg; range 5-82 kg)
28.0% of the recipients weighed <10 kg
## Results: Transplants

<table>
<thead>
<tr>
<th>Category</th>
<th>Paediatric recipients (n=69) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause of liver failure</strong></td>
<td></td>
</tr>
<tr>
<td>acute</td>
<td>4 (6)</td>
</tr>
<tr>
<td>chronic</td>
<td>65 (94)</td>
</tr>
<tr>
<td><strong>Transplant numbers</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>65 (94)</td>
</tr>
<tr>
<td>2</td>
<td>4 (6)</td>
</tr>
<tr>
<td><strong>Transplanted organs</strong></td>
<td></td>
</tr>
<tr>
<td>liver only</td>
<td>62 (90)</td>
</tr>
<tr>
<td>CKL</td>
<td>7 (10)</td>
</tr>
<tr>
<td><strong>Donor type</strong></td>
<td></td>
</tr>
<tr>
<td>deceased</td>
<td>53 (77)</td>
</tr>
<tr>
<td>living</td>
<td>16 (23)</td>
</tr>
</tbody>
</table>
Results: Aetiology of Chronic ESLD

1. Metabolic: Wilsons (2), MSUD (1), oxalosis (4), alpha 1 antitrypsin (4)
2. Genetic: PCKD (3), cystic fibrosis (1)
3. Malignancy: HCC (1), Hepatoblastoma (2)
4. Other: Atypical haemolytic uremic syndrome (1), cholestatic cirrhosis

1. Metabolic: Wilsons (2), MSUD (1), oxalosis (4), alpha 1 antitrypsin (4)
2. Genetic: PCKD (3), cystic fibrosis (1)
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4. Other: Atypical haemolytic uremic syndrome (1), cholestatic cirrhosis
Data

- All children who presented clinically with signs and symptoms of infection in the first year

- 245 infectious events in 65 children

- Many of which were polymicrobial

- 253 were lab confirmed infections – 3.9/child

- Majority were found in blood (91), urine (38) and abdomen (38)

- Majority occurred in first 6 months
Results: Lab Confirmed Infections

- Bacterial: 76.3%
- Viral: 16.6%
- Fungal / yeast: 7.1%
Bacterial Infections

- Gram negative: 62.2%
- Gram positive: 37.3%
- Mycobacteria: 0.5%
Gram Negative Infections: n = 120

Number of infections

- **Escherichia coli**: 41.7%
- **Enterobacter**: 20.8%
- **Pseudomonas**: 11.7%
- **Proteus**: 10%
- **Haemophilus**:
- **Citrobacter**:
- **Serratia**:
- **Acinetobacter**:
- **Unknown/not recorded**:
Viral Infections: n = 42

- Epstein Barr virus: 42.9%
- Cytomegalovirus: 16.7%
- Herpes simplex virus 1: 9.5%
- Other viruses: 0.0%
Fungal/Yeast Infections: \( n = 18 \)

<table>
<thead>
<tr>
<th>Yeast Type</th>
<th>Number of Infections</th>
</tr>
</thead>
<tbody>
<tr>
<td>candida parapsilosis</td>
<td>7</td>
</tr>
<tr>
<td>candida albicans</td>
<td>3</td>
</tr>
<tr>
<td>candida dubliniensis</td>
<td>1</td>
</tr>
<tr>
<td>unidentified yeasts</td>
<td>8</td>
</tr>
</tbody>
</table>

- **candida parapsilosis**: 38.9%
- **candida albicans**: 11.1%
- **candida dubliniensis**: 5.6%
- **unidentified yeasts**: 44.4%
### Blood Based Infections

<table>
<thead>
<tr>
<th>Category</th>
<th>Site of specimen - blood (n=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Bacterial</td>
<td>54</td>
</tr>
<tr>
<td>Viral</td>
<td>31</td>
</tr>
<tr>
<td>Fungus/yeast</td>
<td>6</td>
</tr>
<tr>
<td>Gram positive</td>
<td>24</td>
</tr>
<tr>
<td>Gram negative</td>
<td>30</td>
</tr>
</tbody>
</table>
## Antimicrobial resistance

<table>
<thead>
<tr>
<th>Total number of resistant organisms</th>
<th>n = 49 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial</td>
<td>48/49 (98%)</td>
</tr>
<tr>
<td>Gram positive</td>
<td>11/48 (22,9%)</td>
</tr>
<tr>
<td><strong>Gram negative</strong></td>
<td><strong>36/48 (75,0%)</strong></td>
</tr>
<tr>
<td>Mycobacteria (mycobacterium tuberculosis)</td>
<td>1/48 (2,1%)</td>
</tr>
<tr>
<td>Fungi/yeast (candida parapsilosis)</td>
<td>1/49 (2,0%)</td>
</tr>
</tbody>
</table>
Summary

• Findings

• Relation to international trends

• Patient survival: 90 days 83% (71 – 90% CI)
  1 year 78% (67 – 86% CI)

• Implications for clinical practice
References


• Ashkenazi-Hoffnung L, Moser-Glassberg Y, Bilavsky E et al. Children post liver transplantation hospitalised with fever are at a high risk for bacterial infections. Transplant Infectious Diseases, 2016: 18, 333 – 340


Thank you

- Anne de Voll - Zabrocki
- WDGMC
- Medical students – Chanceplant
- Redcap for data capture
- Biomedical statistician Petra Gaylard
- Colleagues, Doctors
Antimicrobial resistance

Number of infections

- Enterococcus faecium
- Non coagulase...
- Streptococcus species
- Enterobacter
- Escherichia Coli
- Klebsiella
- Epstein barr virus
- Hepatitis virus E
- Candida dubliniensis
Reasons for Mortality

Number of Deaths

- Infection: 8
- Graft failure: 8
- Cardiopulmonary: 5
- Multi-organ failure: 3
- Haemorrhage: 3
- Recurrent tumour: 1
- PTLD: 2
- Other: 2
Enterovirus

Candida parapsilosis
Candida albicans
Klebsiella sp

Enterococcus faecium

Escherichia coli

Staph aureus
Blood – 33.9%
Urine – 15.5%
Abdominal collections – 15.5%
Sputum – 18%
Pus Swabs – 5.3%
Stool – 4.1%
IV lines – 2.9%