Incidence of Acute Cellular Rejection in Heart Transplant Recipients in Correlation with Age and Gender

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Hypothesis
- Heart transplantation is an effective therapy for end-stage heart failure.
- A donor heart is recognized by the recipient immune system as foreign by allorecognition.
- The immune system recognizes and attacks foreign antigens that are not genetically identical.
- The use of immunosuppressive agents to counteract this has improved the survival time.
- Acute cellular rejection (ACR) is most common in the first 6 months after heart transplantation.
- 20-40% of the heart transplant patients will experience at least one episode of ACR (grade 2R or higher) in the first year of transplantation.

Methodology
- After cardiac transplantation, endomyocardial biopsies are used to monitor rejection.
- The specimen undergoes a process of freezing and cutting to produce H&E stained slides.
- The pathologists read the slides to evaluate for the presence of rejection.
- The study population consists of consecutive patients transplanted from 2006-2011.
- Biopsy results for the first three months after transplant were searched for all patients.
- The grades of rejection were recorded along with the gender and age of the patients.

Data

<table>
<thead>
<tr>
<th>Without ACR</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0-18</td>
<td>&gt;18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>212</td>
<td>224</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>53</td>
<td>89</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>265</td>
<td>293</td>
</tr>
</tbody>
</table>

With ACR (Grade 2R or higher)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0-18</td>
<td>&gt;18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>41</td>
<td>43</td>
</tr>
</tbody>
</table>

Histologic Grades of Rejection

Results

- 18 of the total of 354 patients had either no biopsies or were insufficient in the number of biopsies.
- 43 (12.80%) of 336 patients experienced at least one episode of ACR.
- 2 (6.67%) of 30 pediatric patients experienced ACR.
- 41 (13.39%) of 306 adult patients experienced ACR.
- 20 (22.47%) of 89 female patients experienced ACR.
- 23 (9.31%) of 247 male patients experienced ACR.

Conclusions
- We found that the incidence of ACR is lower in our institution compared to the stated incidence in the literature.
- Women are more likely to experience acute cellular rejection than men.
  - Even though males account for the largest number of transplants
- May be due to antibodies already present in recipient females with previous pregnancies
- There is no significant difference in the incidence of ACR between pediatric and adult patients.

Recommendations
- Extend the timeframe to see the evolution of immunosuppressive therapies
- Early antirejection protocols vs more modern protocols
- Analyze a longer period of time following transplantation to get a more accurate percentage of the incidence of acute cellular rejection
- Include other demographics such as ethnicity to see the possible correlation with rejection.