Incidence of Rejection in Renal Transplant Surgery in the LVHN Population Leading to Graft Failure: 6 Year Review

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Incidence of Rejection in Renal Transplant surgery in the LVHN Population Leading to Graft Failure: Study: 6-year Review

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Abstract

To obtain optimal outcomes, it is vital to continually investigate variables potentially affecting rejection and graft failure. 407 renal transplant recipients who were transplanted at the Transplant Center of the Lehigh Valley from January 2009 to December 2014 were included in the study. Patient data was collected from the Organ Transplant Tracking Record (OTTR) database and included transplant date, graft survival time, patient survival time, donor type, type of rejections, treatments received, and demographic information. Those patients who experienced one or more episodes of rejection were then further analyzed to see if there is a correlation between the other factors including, transplant type (living vs. deceased donor, PHS higher risk), demographics (age, sex), delayed graft function (defined as the patient needing dialysis within 7 days of transplant), time on dialysis prior to transplant, cold ischemic time, and the ultimate outcome of the graft.

Methods

A retrospective study was conducted at the Transplant Center of the Lehigh Valley in Allentown, Pennsylvania. The 407 patients that underwent renal transplantation from January 2009 to December 2014 were included in the study. Patient data was collected from the Organ Transplant Tracking Record (OTTR) database and included transplant date, graft survival time, patient survival time, donor type, types of rejections, treatments received, and demographic information. Those patients who experienced one or more episodes of rejection were then further analyzed to see if there is a correlation between the other factors including, transplant type (living vs. deceased donor, PHS higher risk), demographics (age, sex), delayed graft function (defined as the patient needing dialysis within 7 days of transplant), time on dialysis prior to transplant, cold ischemic time, and the ultimate outcome of the graft.

Descriptive statistics were performed on age, gender, type of donor (living vs. deceased), graft failure, delay of graft function, time on dialysis, cold ischemic time, and incidence of rejection and the proportion of each type of rejection. Patients who died with functioning graft were excluded in graft survival. Survival analysis was used to analyze cell mediated rejection, antibody mediated rejection, and delayed graft function, versus graft survival time.

Results

Table 1: Characteristics of patients with at least one incidence of rejection vs. those with none (n=407)

<table>
<thead>
<tr>
<th>Types of Rejection</th>
<th>Patient Population (n=407)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibody Mediated Rejection</td>
<td>Grade 1A 17%</td>
</tr>
<tr>
<td>Cell Mediated Rejection</td>
<td>Grade 2A 2%</td>
</tr>
<tr>
<td>Delayed Graft Function (DGF)</td>
<td>Grade 2B 2%</td>
</tr>
<tr>
<td>Graft Failure</td>
<td>Grade 3 0%</td>
</tr>
<tr>
<td>Patient Survival</td>
<td>Grade 4 0%</td>
</tr>
</tbody>
</table>

Table 2: Incidence of types of rejection in the LVHN population leading to graft failure (n=407)

<table>
<thead>
<tr>
<th>Types of Rejection</th>
<th>Grade 1A</th>
<th>Grade 1B</th>
<th>Grade 2A</th>
<th>Grade 2B</th>
<th>Grade 3</th>
<th>Grade 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibody Mediated Rejection</td>
<td>17%</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Cell Mediated Rejection</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Delayed Graft Function</td>
<td>40%</td>
<td>2%</td>
<td>0%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Graft Failure</td>
<td>40%</td>
<td>2%</td>
<td>0%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

In the LVHN population of renal transplant patients, less severe types of cellular rejection are more common (i.e. Borderline, Grade 1A), while there was a correlation between antibody mediated rejection and graft survival time, the same correlation was not as strong for cell mediated rejection with a p value of >0.05. Antibody mediated rejection appears to have a greater negative effect on graft survival than cell mediated rejection. The incidence of all types of rejection was similar for delayed graft function and non-delayed graft function patients. Previous studies show delayed graft function after Donor after Cardiac Death (DDC) donors does not have the same negative influence on survival as delayed graft function after brain death. Further investigation into delayed graft function patients and types of donors is warranted.

When analyzing graft survival as a continuous variable delayed graft function had a large impact, with the lowest mean graft survival time with a standard error of 53, and cell mediated rejection had the second lowest graft survival time with a similar standard error of 53. Interestingly, antibody mediated rejection had the highest mean graft survival time, but it also had the largest standard error of 114, indicating that its mean is not as well known as the other two. Late rejections may also influence this data.

This study serves to provide a brief overview of the characteristics of the LVHN Renal transplant population. It is a springboard for future investigating the rejection process and graft survival.

Conclusions

1. Acute cellular rejection (particularly Borderline) is more common than antibody mediated rejection
2. Antibody mediated rejection has a statistically significant (p<0.0001) negative impact on graft survival
3. Delayed graft function is common but is not associated with an increased risk of rejection (cellular or antibody mediated)
4. Delayed graft function is associated with shorter graft survival time than other patients

REFERENCES


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