A single center retrospective analysis of post cross-clamp defibrillation rates.

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Disclosures

- I have no disclosures.

Background

- There are many cardioplegia solutions currently in use for pediatric cardiopulmonary bypass (CPB).
- The most common being del Nido solution. Another common cardioplegia solution used for pediatric CPB is St. Thomas.
- In October of 2014, Children’s Mercy Hospital (CMH) changed from the use of St. Thomas to del Nido.
Objectives

- This study aims to compare the rate of post cross-clamp fibrillation requiring defibrillation between del Nido solution and St. Thomas solution stratified by weight at CMH.

The Negative Impact of Electrical Defibrillation

- In open heart surgery, ventricular fibrillation after cross-clamp removal can be a common event.
- Although ventricular fibrillation can be treated rapidly with electrical defibrillation, defibrillation may be a source of injury to the myocardium.
- The ability to prevent the need for ventricular defibrillation with an effective cardioplegia strategy is potentially more important than treating it after it occurs.
Methods

- This retrospective study (IRB #: 15090442) consisted of 394 patients who underwent cardiac surgery requiring cardioplegia between January 1, 2014 and July 31, 2015.
- All patients that underwent cross-clamping and received cardioplegia were included.

Results

- The outcome measured was defibrillation upon cross-clamp removal. Statistical significance was determined using Fishers exact test with a 2 sided significance level of .05.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Del Nido</th>
<th>Defibrillation</th>
<th>%</th>
<th>ST Thomas</th>
<th>Defibrillation</th>
<th>%</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Patients</td>
<td>204</td>
<td>9</td>
<td>4.4</td>
<td>190</td>
<td>51</td>
<td>26.8</td>
<td>P&lt;.0001</td>
</tr>
<tr>
<td>&lt;6 kg</td>
<td>81</td>
<td>1</td>
<td>1.23</td>
<td>66</td>
<td>14</td>
<td>17.5</td>
<td>P&lt;.0003</td>
</tr>
<tr>
<td>6-15 kg</td>
<td>55</td>
<td>1</td>
<td>1.82</td>
<td>64</td>
<td>9</td>
<td>14</td>
<td>P&lt;.0001</td>
</tr>
<tr>
<td>15-60 kg</td>
<td>56</td>
<td>5</td>
<td>8.8</td>
<td>38</td>
<td>23</td>
<td>61</td>
<td>P&lt;.0001</td>
</tr>
<tr>
<td>&gt;60 kg</td>
<td>12</td>
<td>2</td>
<td>16.7</td>
<td>8</td>
<td>5</td>
<td>63</td>
<td>P&lt;.0623*</td>
</tr>
</tbody>
</table>

- Overall a 6-fold decrease in defibrillation rates.
- There was a significant difference in 3 weight stratifications.
### Discussion

**Surgical Risk Category**

<table>
<thead>
<tr>
<th>Stat Score</th>
<th>del Nido</th>
<th>St. Thomas</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>37</td>
<td>44</td>
</tr>
<tr>
<td>3</td>
<td>36</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>66</td>
</tr>
<tr>
<td>1</td>
<td>70</td>
<td>86</td>
</tr>
</tbody>
</table>

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**Discussion**

- Previous studies have shown del Nido to decrease the rate of defibrillation post-cross clamp removal compared to Buckberg solution.
- This decrease in fibrillation rates post cross-clamp removal is likely due to the combined action of Lidocaine and Magnesium.

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Discussion

- By preventing fibrillation post cross-clamp removal you are likely protecting the heart from potential myocardial injury secondary to defibrillation attempts.

Conclusion

- del Nido decreases rate of fibrillation requiring electrical defibrillation post cross-clamp removal when compared to St. Thomas solution.
- This is observed in all weight categories that we measured.

References


Yamamoto H, Yamamoto F. Myocardial protection in cardiac surgery: a historical review from the beginning to current topics. The Texas Heart Institute Journal. 1999;26:71-86.


References


Questions???

I'M DONE

GOT ANY QUESTIONS?