Endocarditis of the Cardiac Valves in the Era of Opioid Crisis

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Endocarditis of the Cardiac Valves in the Era of Opioid Crisis

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Background

- The Opioid epidemic is a very prevalent issue and intravenous drug use is one of the leading causes of infective endocarditis (IE) today
- IE and the course of the disease in IV drug users tends to differ from other patients
  - IV Drug Users: right heart, tricuspid valve, more likely to also have pneumonia, younger, less likely to need surgery
  - Non-IV Drug Users: left heart, aortic and mitral valve, more likely to also have history of CVA and/or PVD, older, more indications for surgery

Objectives

- Analyze the demographics, medical histories, surgical results, perioperative, 30-day, and yearly outcomes of patients who underwent cardiac valve surgery for infective endocarditis
- Compare the resulting data for intravenous (IV) drug users versus non-IV drug users
- Evaluate the total hospital charges for the treatment of patients with endocarditis requiring surgery

Method

- Retrospective review of 1,302 records of LVHN patients diagnosed with IE
- Narrowed down to 75 patients who underwent cardiac valve surgery for endocarditis from October 2015 – June 2019
- Patient data was organized into two groups: IV drug users and non-IV drug users

The results were compared; postoperative mortality and total hospital charges were the primary outcome focuses.

Results

Graph 1. number of IV drug user patients vs. non-IV drug user patients with IE for each valve

Graph 2. Kaplan-Meier analysis showing the survival fraction over each full month; line a is non-IV drug users and line b is IV-drug users

Graph 3. total hospital charges for the treatment of IE in patients from each group

Graph 4. Length of stay (LOS) versus total hospital charge for each patient

Table 1. patient demographics and medical histories

<table>
<thead>
<tr>
<th></th>
<th>Non-IV Drug Users</th>
<th>IV Drug Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>a 62.1±12.7</td>
<td>b 34.6±12.7</td>
</tr>
<tr>
<td>Female</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>COPD</td>
<td>0.8</td>
<td>1.6</td>
</tr>
<tr>
<td>ESR</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Diabetes</td>
<td>33.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Chronic Renal Disease</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>PVD</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>MVR</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Circumflex Aortic</td>
<td>11.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>New Aortic</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Graph 5. Kaplan-Meier analysis showing survival drop off for IV drug user group in the first 5 months and then a plateau, whereas non-users have a more gradual drop over the first 10 months before it plateaus

Table 2. displays patient perioperative and follow-up outcomes

<table>
<thead>
<tr>
<th></th>
<th>Non-IV Drug Users</th>
<th>IV Drug Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Day Mortality</td>
<td>11.1%</td>
<td>5.6%</td>
</tr>
<tr>
<td>In-House Mortality</td>
<td>50.0%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Mortality</td>
<td>20.0%</td>
<td>11.1%</td>
</tr>
<tr>
<td>No Follow up</td>
<td>45.6%</td>
<td>44.4%</td>
</tr>
<tr>
<td>Ventricular Septal Defect</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Pericardial Bleed</td>
<td>15.8%</td>
<td>12.3%</td>
</tr>
</tbody>
</table>

Conclusion

- Average age of IV drug users is significantly lower than non-IV drug users (34.6 vs. 62.1)
- Bar graph shows IV drug users made up majority of patients with infection of the tricuspid valve, whereas non-IV drug users made up majority of patients with infections of the mitral and aortic valves
- Ventilator dependent respiratory failure (VDRF) and new need for a pacemaker implantation are the two most common complications researched in the IV-drug user group (22.2% and 33.3%)
- IV-drug user group had 20.0% mortality and non-IV drug user group had 17.7% mortality
- Kaplan Meier analysis shows survival drop off for IV drug user group in the first 5 months and then a plateau, whereas non-users have a more gradual drop over the first 10 months before it plateaus
- The median hospital charge for IV drug user patients is higher than non-IV drug users, but the data is less consistent in the IV drug user group
- There is a positive correlation between hospital LOS for patients and total hospital charges related to treatment of endocarditis

References


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