Hemodynamic Effects of 40cc vs. 50cc IAB
Kapur et al.

Hemodynamic Effects of Standard Versus Larger-Capacity Intraaortic Balloon Counterpulsation Pumps

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In real-world practice the 50cc IAB provides greater diastolic augmentation and systolic unloading compared to the 40cc IAB
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Introduction
The aim of this study was to explore the hemodynamic effects of the 50cc IAB in real-world practice

Methods
Retrospective, single center review of 52 patients
- N=26 patients with the 40cc IAB
- N=26 patients with the 50cc IAB

Data Obtained:
- Patient demographics
- Indication for use
- Clinical outcomes: in-hospital mortality and device related complications
- Hemodynamic measurements
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Methods for IABP tracing analysis

Systolic Unloading

- Difference between unassisted systole (B) and assisted systole (F) pressure

Diastolic Augmentation

- Difference between non-augmented (A) and augmented diastolic (D) pressure
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Results: Demographics and indications

No difference in patient baseline characteristics or medications used were observed

<table>
<thead>
<tr>
<th>Indications for Use:</th>
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</thead>
<tbody>
<tr>
<td>ADHF 33%; n=17</td>
<td>ACS 33% n=17</td>
</tr>
<tr>
<td></td>
<td>Non-STEMI 6% n=3</td>
</tr>
<tr>
<td></td>
<td>STEMI 27% n=14</td>
</tr>
<tr>
<td>CGS 23% n=12</td>
<td>HR=PCI 12% n=6</td>
</tr>
</tbody>
</table>

Acute decompensated heart failure (ADHF); Acute coronary syndrome (ACS); ST elevated myocardial infarction (STEMI); Cardiogenic shock (CGS); High-risk percutaneous coronary intervention (HR-PCI)
Hemodynamic Effects of 40cc vs. 50cc IAB

**Results: Hemodynamic variables**

<table>
<thead>
<tr>
<th>Significant IABP Hemodynamic Variables</th>
<th>40cc IAB</th>
<th>50cc IAB</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented diastolic pressure</td>
<td>115 ± 20</td>
<td>134 ± 26</td>
<td>.01</td>
</tr>
<tr>
<td>Systolic unloading</td>
<td>9 ± 4</td>
<td>13 ± 7</td>
<td>.01</td>
</tr>
</tbody>
</table>

**Pulmonary artery catheter indices within 24 hours before and after IABP deployment.**

<table>
<thead>
<tr>
<th></th>
<th>Before IABP Activation</th>
<th>After IABP Activation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40cc IAB</td>
<td>50cc IAB</td>
</tr>
<tr>
<td>PA diastolic pressure (mmHg)</td>
<td>28 ± 12</td>
<td>30 ± 7</td>
</tr>
<tr>
<td>PA occlusion pressure (mmHg)</td>
<td>30 ± 11</td>
<td>31 ± 7</td>
</tr>
<tr>
<td>Cardiac output (L/min)</td>
<td>3.9 ± 1.2</td>
<td>3.5 ± 1</td>
</tr>
<tr>
<td>Cardiac index (L/min/m²)</td>
<td>2.0 ± 0.5</td>
<td>1.7 ± 0.3</td>
</tr>
<tr>
<td>PA oxygen saturation (%)</td>
<td>54 ± 9</td>
<td>49 ± 8</td>
</tr>
</tbody>
</table>

*p < .05, before vs. after 50cc IABP activation

Note: PA catheter data available before and after IAB implantation in 20 patients
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Results: Hemodynamic variables

Within 24 hours of 50cc IAB activation:
PA diastolic and occlusion pressures were reduced
CO, CI and PA oxygen saturation pressures increased
Absolute change in CO:
0.7L (18%) in the 40cc group and 1.4L (40%) in the 50cc group (P=.08)
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Results: Clinical outcomes

In-hospital mortality: 23% for all patients
  27% 40cc vs. 19% 50cc IAB ($P$- NS)

TIMI major bleeding: 15% in all patients
  19% 40cc vs. 12% 50cc IAB ($P$=.80)

No patient required initiation of percutaneous left ventricular assist
device (LVAD)
Discussion

50cc IAB provides greater diastolic augmentation and systolic unloading compared to the 40cc IAB

50cc IAB compared with the 40cc IAB recipients:
- Achieved a greater reduction in cardiac filling pressures and increase in CO
- A reduction in systolic pressure >10 mm Hg
- Magnitude of systolic unloading correlates directly with the magnitude of diastolic augmentation and inversely with PA occlusion pressures
Thank you!