Clinical Outcomes for Impella Procedure in Octogenarians, Nonagenarians, and Centenarians: A Retrospective Cohort Study

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Clinical Outcomes for Impella Procedure in Octogenarians, nonagenarians, and centenarians: A retrospective cohort study

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Background

- Impella is a percutaneously inserted ventricular assist device that has been widely used in patients with severe heart failure complicated by cardiogenic shock.  
- There is limited data available on the impact of Impella procedure among the older population.

Aim

- We sought to examine the national inpatient sample database to describe in-hospital outcomes among these patients.

Methods

- National Inpatient Sample (NIS): 2019 and 2020
  - International Classification of Diseases 10th revision codes
  - Hospitalizations of Adult Impella Patients (8,233 patients)
  - Linear regression and Multivariate logistic used to adjust for confounders

Table 1. Comparison of prevalence of various outcomes in Impella patients with and without hyperlipidemia.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>≥ 80 years old (n = 1389)</th>
<th>&lt; 80 years old (6884 Patients)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension (%)</td>
<td>32.7</td>
<td>29.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diabetes Mellitus (%)</td>
<td>24.6</td>
<td>15.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chronic Kidney Disease (%)</td>
<td>12.1</td>
<td>8.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>In-Hospital Mortality (%)</td>
<td>8.5</td>
<td>6.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total Hospital Charges ($)</td>
<td>$234,489</td>
<td>$225,969</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>12.6</td>
<td>10.5</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 2. Associations between various conditions and hyperlipidemia among Impella patients.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Hospital Mortality</td>
<td>1.182</td>
<td>(1.162 – 1.202)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Acute Kidney Failure</td>
<td>1.164</td>
<td>(1.150 – 1.179)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ventricular Arrhythmia</td>
<td>1.107</td>
<td>(1.094 – 1.120)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Stroke</td>
<td>1.293</td>
<td>(1.247 – 1.339)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sepsis</td>
<td>1.150</td>
<td>(1.129 – 1.179)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Deep Vein Thrombosis</td>
<td>1.120</td>
<td>(1.079 – 1.163)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Results

- This study included 8233 patients who underwent Impella insertion, of which 1389 (16.8%) are older population.
- Older PE patients who were ≥ 80 YO who underwent Impella insertion had higher prevalence of hypertension (32.7% Vs 29.1%, P < 0.001), diabetes mellitus (24.6% Vs 15.6% p < 0.001), and chronic kidney disease (12.1% Vs 8.0%, P < 0.001) compared to younger patients. In-hospital mortality was higher among the older population (8.5% VS 6.0% p<0.001).
- Multivariate regression showed that older patients who underwent Impella procedure had higher inpatient mortality (OR 1.182, 95% CI 1.162–1.202, P < 0.001). On linear regression analysis, increased age was associated with increased in-hospital mortality (p<0.001). It was also shown that older Impella patients pay more TOTHCG ($234,489 VS $225,969, P<0.001) in addition to longer length of stay (LOS) (12.6 days VS 10.5 days, p<0.001).
- On secondary analysis it has shown that older population who underwent Impella insertion had higher odds of having ventricular arrhythmia (OR 1.107, 95% CI 1.094-1.120, P < 0.001), stroke (OR 1.293, 95% CI 1.247-1.339, P < 0.001), acute kidney failure (OR 1.164, 95% CI 1.150-1.179, P < 0.001), deep vein thrombosis (DVT, OR 1.120, 95% CI 1.079-1.163, P < 0.001), and sepsis (OR 1.150, 95% CI 1.129-1.172, P < 0.001).

Conclusion

- In this nationally representative population-based retrospective cohort study, Impella procedure was associated with higher mortality and worse outcomes among older patients.

References


Figure 1. Venous implantation of Impella on Right side of heart.

References