Comparison of Chronic Persistent and Post-Operative Atrial Fibrillation on Long Term Survival in Patients Undergoing Cardiac Valve Surgery

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Background:
Patients with valvular heart disease have a higher incidence of chronic persistent atrial fibrillation (CPAF). Patients in sinus rhythm undergoing valve surgery have a high risk of post-operative AF (POAF). Both CPAF and POAF are associated with significant morbidity and mortality after cardiac surgery. There has been no study comparing long term mortality outcomes among the two groups in patients undergoing valve surgery.

Methods:
556 consecutive patients who underwent cardiac valve surgery at Lehigh Valley Health Network during 2005-2007 were retrospectively reviewed. Patients were divided into three cohorts:

- **Cohort A** - patients in sinus rhythm before and after surgery
- **Cohort B** - patients in AF before undergoing the surgery
- **Cohort C** - patients in sinus rhythm before the surgery and having AF after the surgery.

Results:
The study group included 42% women. 139 with CPAF underwent valve surgery. POAF occurred in 124 (30%) patients. The mean age of patients in cohort A was 67.8 ± 12.5 yrs. Compared to cohort A (67.8 ± 12.5 yrs), patients in cohort B (73.1 ± 9.9 yrs; p<.01) and C (72.4 ± 9.9 yrs; p<.01) were significantly older.

Baseline Characteristics of Patients Undergoing Cardiac Valve Surgery (N=556)

<table>
<thead>
<tr>
<th></th>
<th>Patients with Neither Persistent or Post op AF (n=293) (%)</th>
<th>Mean ± SD</th>
<th>Post op AF (%)</th>
<th>Mean ± SD</th>
<th>Post-op AF (%)</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, years</strong></td>
<td>67.8 ± 12.5</td>
<td>73.1 ± 9.9</td>
<td>72.4 ± 9.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>124 (42.9)</td>
<td>96 (49.3)</td>
<td>63 (57.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smoker (active)</strong></td>
<td>42 (14.9)</td>
<td>11 (7.6)</td>
<td>11 (8.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>History of heart failure</strong></td>
<td>102 (35.3)</td>
<td>80 (50.7)</td>
<td>72 (57.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Left ventricular ejection fraction</strong></td>
<td>52.6 ± 11.9</td>
<td>54.2 ± 12.1</td>
<td></td>
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</tr>
</tbody>
</table>

Post-Operative History

- **Hypertension**
  - 222 (79.6)
  - 117 (70.4)
  - 98 (79.6)

- **Diabetes Mellitus**
  - 77 (26.6)
  - 41 (28.0)
  - 34 (27.4)

- **History of tobacco use**
  - 158 (54.7)
  - 79 (56.8)
  - 73 (56.8)

- **COPD**
  - 68 (23.5)
  - 51 (36.7)
  - 29 (23.4)

Echocardiographic Findings

- **Left ventricular wall thickness**
  - 1.36 ± 0.31
  - 1.34 ± 0.31
  - 1.36 ± 0.32

- **Left atrial diameter**
  - 4.53 ± 1.6
  - 5.2 ± 1.4
  - 4.6 ± 0.8

Surgical Details

- **Cardiopulmonary bypass duration**
  - 130.0 ± 50.8
  - 145.6 ± 43.6
  - 130.0 ± 50.7

- **Coronary bypass surgery performance**
  - 108 (56.4)
  - 55 (29.7)
  - 66 (53.2)

- **Mitral valve surgery**
  - 75 (40.4)
  - 60 (46.8)
  - 26 (26.0)

- **Aortic valve surgery**
  - 225 (78.8)
  - 66 (66.0)
  - 99 (79.8)

Comparison of Outcomes of the Three Groups (N=556)

<table>
<thead>
<tr>
<th></th>
<th>Patients with Neither Persistent or Post op AF (n=293) (%)</th>
<th>Mean ± SD</th>
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<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prolonged ventilation</strong></td>
<td>13 (4.5)</td>
<td>9 (5.8)</td>
<td>14 (14.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Heart block</strong></td>
<td>19 (6.6)</td>
<td>10 (7.2)</td>
<td>7 (5.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pneumonia</strong></td>
<td>19 (6.6)</td>
<td>2 (1.4)</td>
<td>2 (1.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Septicemia</strong></td>
<td>7 (2.4)</td>
<td>2 (1.4)</td>
<td>7 (5.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stroke</strong></td>
<td>9 (3.1)</td>
<td>6 (4.3)</td>
<td>10 (8.1)</td>
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</tbody>
</table>

Hospital stay duration, days

- 7.12 ± 4.9
- 10.5 ± 6.1
- 11.3 ± 5.3

Kaplan-Meier Plots for All-Cause Mortality

Conclusions:
Both patients with CPAF and POAF have higher long term mortality rates than patients in normal sinus rhythm. In-hospital and long-term mortality outcome in patients with CPAF and POAF are similar.