Ongoing evaluation of the impact of a post-operative atrial fibrillation prevention protocol for patients undergoing cardiothoracic surgery

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Citation

Sankar, Kamarena; Kline, Jonatha; Clarke, Heidi; Gopalani, Radhan; and Quadri, Faaria, "Ongoing evaluation of the impact of a post-operative atrial fibrillation prevention protocol for patients undergoing cardiothoracic surgery" (2018). *All Publications*. 3100.  
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BACKGROUND

Atrial Fibrillation is a common post-operative complication that may occur in up to 40% of patients following cardiothoracic surgery (CTS). It is caused by pre-existing degenerative changes to myocardium and perioperative conditions that alter electrophysiological parameters. Per P&T approved protocol, all patients undergoing CTS will be initiated prophylactic medications post-operatively unless contraindicated. After extubation, patients will be switched to oral equivalents.

Amiodarone: 150 mg IV bolus followed by amiodarone infusion 1 mg/minute x 6 hours then decrease rate to 0.5 mg/minute x 18 hours.

Metoprolol: 5 mg IV every 6 hours, Hold for SBP < 100 or HR > 60 if currently paced via epicardial wires.

Ketorolac: 30 mg IV every 6 hours x 48 hours while intubated reduce dose to 15 mg IV every 6 hours for CrCl 25-50 mL/min. Do not give ketorolac if patient is actively bleeding or CrCl < 25 mL/min.

In April 2018, an interim analysis was done on 50 patients pre protocol implementation, and 100 patients post protocol implementation. This interim analysis helped guide nurses by helping to establish current hold parameters for protocol medications.

OBJECTIVES

1. Compare the incidence of POAF CTS patients prior to and after implementation of a protocol that standardizes the prophylactic management of Post-Operative Atrial Fibrillation (POAF) in all post-operative patients.

METHODS

1. Study Design: Single center, IRB exempt, retrospective chart review pre and post protocol implementation.

2. Data Collection Period:
   - Pre Implementation: June 1st, 2017 to August 31st, 2017
   - Interim Evaluation: October 1st, 2017 to February 29th, 2018
   - Ad Hoc: March 1st, 2018 to October 21st 2018

3. Inclusion criteria:
   - Age ≥ 18 years
   - Received Coronary Artery Bypass Graft and/or valvular surgery during pre and post protocol implementation periods listed above

4. Exclusion criteria:
   - Active atrial fibrillation/flutter or either arrhythmia at time of surgery
   - Primary Endpoint
     - Incidence of POAF in CTS, patients prior to and after protocol implementation
   - Secondary Endpoint
     - Intensive Care Unit (ICU) and Hospital Length of Stay (LOS)
     - Safety of protocol medications
     - P&T approved protocol compliance

LIMITATIONS

1. Small sample size

2. Two different investigators at different stages of the data collection

OUTCOMES

Baseline Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Pre (n=50)</th>
<th>Interim (n=100)</th>
<th>Ad Hoc (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>63 (SD=12)</td>
<td>63 (SD=12)</td>
<td>64 (SD=12)</td>
</tr>
<tr>
<td>Systolic blood pressure, mm Hg</td>
<td>150 (SD=20)</td>
<td>150 (SD=20)</td>
<td>150 (SD=20)</td>
</tr>
<tr>
<td>Cytokine levels</td>
<td>100 (SD=50)</td>
<td>100 (SD=50)</td>
<td>100 (SD=50)</td>
</tr>
<tr>
<td>Safety parameters</td>
<td>100 (SD=10)</td>
<td>100 (SD=10)</td>
<td>100 (SD=10)</td>
</tr>
</tbody>
</table>

Percent of Patients with Post-Operative Atrial Fibrillation

- 36%
- 25%
- 16%

Overall post protocol incidence of POAF = 22%

OUTCOMES

Risk Factor Comparison (n=150)

<table>
<thead>
<tr>
<th></th>
<th>No POAF (n=117)</th>
<th>POAF (n=33)</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of atrial fibrillation, n (%)</td>
<td>9 (8)</td>
<td>15 (45)</td>
</tr>
<tr>
<td>Mitral valvular disease, n (%)</td>
<td>9 (8)</td>
<td>6 (18)</td>
</tr>
<tr>
<td>Time on cardiopulmonary bypass (min)</td>
<td>98</td>
<td>139</td>
</tr>
<tr>
<td>Hypotension requiring vasopressors, n (%)</td>
<td>51 (44)</td>
<td>21 (64)</td>
</tr>
</tbody>
</table>

Protocol Compliance (n=150)

<table>
<thead>
<tr>
<th></th>
<th>No POAF (n=117)</th>
<th>POAF (n=33)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of agents received</td>
<td>52 (44)</td>
<td>8 (24)</td>
</tr>
<tr>
<td>Two agents received, n (%)</td>
<td>44 (38)</td>
<td>9 (27)</td>
</tr>
<tr>
<td>One agent received, n (%)</td>
<td>19 (16)</td>
<td>12 (36)</td>
</tr>
<tr>
<td>No agent received, n (%)</td>
<td>2 (2)</td>
<td>4 (12)</td>
</tr>
</tbody>
</table>

Safety Evaluation (n=150)

<table>
<thead>
<tr>
<th></th>
<th>Metoprolol</th>
<th>Amiodarone</th>
<th>NSAID</th>
</tr>
</thead>
<tbody>
<tr>
<td>No POAF (n=117)</td>
<td>114</td>
<td>127</td>
<td>76</td>
</tr>
<tr>
<td>ADR Requiring Dose Reduction or Discontinuation</td>
<td>18</td>
<td>31</td>
<td>12</td>
</tr>
</tbody>
</table>

CONCLUSIONS

1. Incidence of POAF following CTS has reduced from 36% pre protocol to 22% post protocol with a relative risk reduction of 39%.
2. Prescribing of amiodarone and NSAIDs through this protocol has continued to improve post protocol implementation.
3. The number of protocol medications received is indirectly proportional to incidence of POAF development.
4. History of Atrial Fibrillation poses a major risk for POAF development after CTS.

DISCLOSURES

The study contributors have nothing to disclose regarding any financial or nonfinancial relationships with the products described, reviewed, or evaluated in this presentation.

REFERENCES