Assessment of Venous Thromboembolism Rates Following Elective Total Knee and Total Hip Arthroplasties in Patients Receiving Prophylactic Twice Daily Aspirin

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**Background**
- Patients who undergo high-risk orthopedic procedures including total hip arthroplasty (THA) and total knee arthroplasty (TKA) are at an increased risk of venous thromboembolic (VTE) events.\(^1,2\)
- Both AAOS and ACCP state that aspirin is one of the acceptable medication options for postoperative VTE prophylaxis.\(^1,2\)
  - Reported VTE rate from ACCP: 2.3%; 1.8% for symptomatic DVTs and 0.5% for PEs.\(^2\)
  - Neither group specifies the optimal dosing or duration of aspirin therapy
- 2016 meta-analysis and systematic review analyzed VTE rates from 39 studies with patients who underwent THA or TKA and received aspirin as the sole chemoprophylatic agent.\(^3\)
  - Pooled rate of DVTs from 16 studies to be 1.2% and the pooled rate of PEs from 25 studies to be 0.6%
  - Concluded that aspirin is a suitable therapy for VTE prevention following a TKA or THA

**Methods**

**Objective:** Compare the rates of VTEs that occurred within 90 days of elective TKA or THA in patients receiving aspirin 325 mg orally twice daily for 6 weeks to literature-derived rates.
- Retrospective, single-center, observational study
- Study groups: Subjects who received a hospital discharge prescription for aspirin 325 mg by mouth twice daily for 6 weeks for VTE prophylactic therapy following elective THA or TKA
- Subgroups: Type of procedure (THA or TKA) and type of VTE (DVT or PE)

**Inclusion Criteria**
- Adults who underwent elective THA or TKA between January 2014 and October 2016
- Prescribed aspirin 325 mg PO BID x 6 weeks
- Had a Billings Clinic primary care provider

**Exclusion Criteria**
- Patients prescribed other medications at discharge that were efficacious for VTE prophylaxis regardless of indication
- Non-elective THAs or TKAs (e.g., trauma)
- Pregnant or breast feeding

**Primary Outcome**
- Analyze the percentage of eligible patients who experienced symptomatic VTEs within 90 days of surgery

**Secondary Outcomes**
- Rates of symptomatic DVTs or PEs
- Number of days after surgery that the patient experienced a VTE
- Major bleeding within 90 days of surgery
- 90-day all-cause mortality following TKA or THA

**Results**

**Baseline Characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All Participants (n=565)</th>
<th>THA (n=214)</th>
<th>TKA (n=351)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean years ± SD</td>
<td>65.4 ± 10</td>
<td>64.4 ± 10.7</td>
<td>66 ± 9.6</td>
<td>0.07</td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>324 (57)</td>
<td>120 (56)</td>
<td>204 (58)</td>
<td>0.63</td>
</tr>
<tr>
<td>Length of stay, mean days ± SD</td>
<td>2.8 ± 1.8</td>
<td>2.7 ± 1</td>
<td>2.8 ± 1.5</td>
<td>0.63</td>
</tr>
</tbody>
</table>
Primary Outcome

Comparative VTE and Bleeding Rates

<table>
<thead>
<tr>
<th>Comparative VTE Rates Post-THA or TKA</th>
<th>Treatment</th>
<th>VTE</th>
<th>DVT</th>
<th>PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012 ACCP Guidelines&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Enoxaparin</td>
<td>1.8%</td>
<td>1.25%</td>
<td>0.55%</td>
</tr>
<tr>
<td></td>
<td>No VTE prophylaxis</td>
<td>4.3%</td>
<td>2.8%</td>
<td>1.5%</td>
</tr>
<tr>
<td>2016 Meta-analysis&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Aspirin</td>
<td>1.8%</td>
<td>1.2%</td>
<td>0.6%</td>
</tr>
<tr>
<td></td>
<td>Other VTE prophylaxis</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>This Study</td>
<td>Aspirin</td>
<td>0.9%</td>
<td>0.2%</td>
<td>0.7%</td>
</tr>
<tr>
<td></td>
<td>Other VTE prophylaxis</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

VTE Occurrence Rates

<table>
<thead>
<tr>
<th>Event</th>
<th>All Participants (n=565)</th>
<th>THA (n=214)</th>
<th>TKA (n=351)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTE, n (%)</td>
<td>5 (0.9)</td>
<td>1 (0.5)</td>
<td>4 (1.1)</td>
<td>0.41</td>
</tr>
<tr>
<td>DVT, n</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>PE, n</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>--</td>
</tr>
</tbody>
</table>

Secondary Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>All Participants (n=565)</th>
<th>THA (n=214)</th>
<th>TKA (n=351)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTE occurrence after surgery, mean days ± SD</td>
<td>13 ± 6.8</td>
<td>20 ± 0</td>
<td>13.2 ± 6.8</td>
</tr>
<tr>
<td>Major bleeding, n (%)</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
<td>0</td>
</tr>
<tr>
<td>90-day all-cause mortality, n (%)</td>
<td>5 (0.9)</td>
<td>1 (0.5)</td>
<td>4 (0.1)</td>
</tr>
</tbody>
</table>

Discussion

- Lower rates of VTE compared to established literature values
- Majority of VTE occurrences happened in 2016
  - 4/5 were obese
  - 4/5 were women
  - 4/5 were >40 years old
  - None had prior VTEs
- 90 day all-cause mortality
  - One was related to THA complication
  - None from VTE occurrence
  - Occurred average of 47 days after surgery
- Major bleed only occurred in one patient
  - 82 year old male receiving THA, gastrointestinal bleed, required re-hospitalization

Limitations

- Comparing VTE rates studies with different designs and criteria for inclusion
- Retrospective design
- Patients were excluded if taking other anticoagulants
- Concomitant antiplatelet therapy not assessed
- Quazi-randomization could have missed VTEs
- Did not assess aspirin compliance

Conclusions

- In this study, subjects undergoing elective TKA or THA who received aspirin 325 mg orally twice daily for 6 weeks had lower rates of VTE occurrence than historically published literature values

References: