Introduction

Over 1 million total hip arthroplasty (THA) and total knee arthroplasty (TKA) surgeries were performed in 2010.1

Guidelines recommend anticoagulation to reduce the risk of venous thromboembolism (VTE) in this population.2

Evidence supports various therapeutic options for VTE prophylaxis, leading to significant variability in practice and the potential for complications such as bleeding.

Bleeding associated with orthopedic surgery is not universally defined, leading to under-recognition of true bleeding events.3

Objectives

To develop criteria that most reproducibly and accurately identifies patients with a bleed following THA and TKA.

Develop a risk assessment for bleeds that may improve medication selection.

Methods

Retrospective electronic medical record review of patients that underwent THA or TKA within UPMC.

IRB approved before commencement

Honest broker de-identified records and collected the following variables:

- Age
- Sex
- Body Mass Index
- Smoking history
- Home medications: aspirin, warfarin, enoxaparin, fondaparinux, rivaroxaban

Operating room reports, progress notes, discharge summaries, disposition & ER notes

- ICD-9 codes for bleeding complications on or after surgery date & up to 90 days post-op

Laboratory data

- Hemoglobin (Hgb)
- Hematocrit (Hct)
- Serum Creatinine (SCr)
- Estimated Glomerular Filtration Rate (eGFR)
- Platelets
- International Normalized Ratio (INR)
- Activated Partial Thromboplastin Time (aPTT)

Hgb decline ≥ 2 gm/dL

Trigger word for bleeding: hemorrhage, epistaxis, hematoma, gastrointestinal, rectal, hematuria, hemoptysis, intra-articular bleeds

Table 1. Antithrombotic Use During and After THA or TKA

<table>
<thead>
<tr>
<th>Medication</th>
<th>THA</th>
<th>TKA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>819</td>
<td>633</td>
</tr>
<tr>
<td>Warfarin</td>
<td>512</td>
<td>430</td>
</tr>
<tr>
<td>Enoxaparin</td>
<td>430</td>
<td>285</td>
</tr>
<tr>
<td>Fondaparinux</td>
<td>468</td>
<td>455</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>1212</td>
<td>685</td>
</tr>
<tr>
<td>Heparin</td>
<td>1088</td>
<td>229</td>
</tr>
</tbody>
</table>

Table 2. Bleeding Evaluation Based on ICD-9 Code (n = 60)

<table>
<thead>
<tr>
<th>Patient Receiving Antithrombotic (%)</th>
<th>Evidence Bleeding Occurred (%)</th>
<th>Suggested Drug-Related Bleed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>58 (96.7)</td>
<td>43 (71.7)</td>
</tr>
<tr>
<td>No</td>
<td>2 (3.3)</td>
<td>8 (13.3)</td>
</tr>
<tr>
<td>Unknown</td>
<td>0 (0.0)</td>
<td>9 (15.0)</td>
</tr>
</tbody>
</table>

Conclusions

- Current progress demonstrates the feasibility of evaluating drug-related bleeding based on identified clinical indicators for an orthopedic surgery population.

- Next steps will be to assess the other clinical indicators for bleeding within randomly selected cohorts and then apply each to the overall population.

- The results from the evaluation of each indicator will be used to construct a bleeding risk assessment to optimize medication use for these patients.

Disclosures and references

The authors of this poster have no actual or potential conflicts of interest.

