Full Reversal of Anticoagulants Before Cephalomedullary Fixation of Geriatric Hip Fractures May Not Be Necessary

Mark Hake, MD
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Disclosures

• None pertinent to this talk
Introduction

• Timely surgical treatment of geriatric hip fractures within 24-48 hours is recommended
• Some advocate for delay in treatment for patients on DOACs.
• Goal: Evaluate blood loss in patients taking anticoagulants undergoing CMN
Methods

- Retrospective review
  - All patients 60 years and older
  - Acute, isolated extracapsular hip fracture treated with CMN
  - 10 years of data from THAA and U of M

- Exclusion criteria:
  - Missing data, path fracture, other procedures
Methods

• Study Groups
  • Direct Oral Anticoagulants
  • Warfarin
  • Antiplatelet
  • Control

• Primary Outcome
  • Calculated blood loss
  • Transfusion Risk
  • Hospital LOS
  • Overall 1-year mortality
Methods

Direct Oral Anticoagulants

<table>
<thead>
<tr>
<th>Drug</th>
<th>Phase 1: Recommended Initial Anticoagulant Dosing</th>
<th>Phase 2: Completion of Anticoagulation Dosing (Finish after 3-6 months)</th>
<th>Phase 3: Extended Anticoagulation Prophylaxis Dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apixaban</td>
<td>10mg daily x 7 days</td>
<td>5mg twice daily</td>
<td>3-6 months after treatment, dose reduction to 2.5mg twice daily</td>
</tr>
<tr>
<td>Dabigatran</td>
<td>5-10 days of parenteral anticoagulation</td>
<td>150mg twice daily</td>
<td>150 mg twice daily²</td>
</tr>
<tr>
<td></td>
<td>Not recommended if CrCl&lt;30mL/min</td>
<td></td>
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</tr>
<tr>
<td>Edoxaban</td>
<td>5-10 days of parenteral anticoagulation then initiate drug</td>
<td>60mg daily if CrCl &gt;51 mL/min</td>
<td>60mg daily if CrCl &gt;51 mL/min</td>
</tr>
<tr>
<td></td>
<td>30mg daily if CrCl 30-50mL/min</td>
<td>30mg daily if CrCl 30-50mL/min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not recommended if CrCl&lt;30mL/min</td>
<td>Not recommended if CrCl&lt;30mL/min</td>
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<tr>
<td></td>
<td>30mg daily if body weight ≤60kg or in combination with a P-glycoprotein inhibitor</td>
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</tr>
<tr>
<td>Rivaroxaban</td>
<td>15mg twice daily x 21 days</td>
<td>20mg daily</td>
<td>3-6 months after treatment, dose reduction to 10mg daily</td>
</tr>
<tr>
<td></td>
<td>Avoid use if CrCl &gt;95 mL/min</td>
<td>3-6 months after treatment, dose reduction to 10mg daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Avoid use if CrCl&gt;15mL/min</td>
<td>Avoid use if CrCl&gt;15mL/min</td>
<td></td>
</tr>
</tbody>
</table>

Antiplatelet

<table>
<thead>
<tr>
<th>Drug</th>
<th>Mechanism of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>COX inhibitors</td>
</tr>
<tr>
<td>Dipyridamole</td>
<td>Phosphodiesterase inhibitors</td>
</tr>
<tr>
<td>Treprostinil</td>
<td>Analogue of prostacyclin</td>
</tr>
<tr>
<td>Clopidogrel</td>
<td>ADP antagonists</td>
</tr>
<tr>
<td>Prasugrel</td>
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<tr>
<td>Ticagrelor</td>
<td></td>
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<tr>
<td>Tirolodine</td>
<td></td>
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<tr>
<td>Abciximab</td>
<td>GP IIb/IIIa inhibitors</td>
</tr>
<tr>
<td>Eptifibatide</td>
<td></td>
</tr>
<tr>
<td>Tirofiban</td>
<td></td>
</tr>
</tbody>
</table>
Methods

• Retrospective review
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• Exclusion criteria:
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Methods

• Original project
  • Blood loss for Short vs Long CMNs
  • Calculated blood loss for accuracy
  • 26% reduction in CBL and 21% transfusion risk using short CMNs

\[
CBL = \frac{V_{blood} \times (Hct_0 - Hct_1)}{100 + V_{RBC} \times 0.6} \times \frac{200}{(Hct_0 + Hct_1)}
\]
Results

• 1,442 patients
  • 47 DOACs
  • 148 Warfarin
  • 657 antiplatelet
  • 590 controls

• Calculated blood loss was significant only between Antiplatelet vs Control groups
  • 1386 mL (SD 837 mL) vs. 1254 mL (SD 864 mL) \((p<0.001)\)

• Rate of transfusion was significant between Antiplatelet (42.7%) versus Control (33.1%) \((p < 0.001)\)
Results

**Blood Loss**

**Transfusion**

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Transfused Patients</th>
<th>Total Cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOAC</td>
<td>14 (29.8%)</td>
<td>47</td>
</tr>
<tr>
<td>Warfarin</td>
<td>60 (40.6%)</td>
<td>148</td>
</tr>
<tr>
<td>Antiplatelet*</td>
<td>281 (42.7%)</td>
<td>657</td>
</tr>
<tr>
<td>Control</td>
<td>195 (33.1%)</td>
<td>590</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>550 (38.1%)</strong></td>
<td><strong>1,442</strong></td>
</tr>
</tbody>
</table>

*Statistically Significant

**Length of Stay**
Results

![Kaplan-Meier Survival Estimates](image)

- DOAC
- Warfarin*
- Antiplatelet*
- Control

* Statistically Significant

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Conclusions

• Delaying surgery or reversing DOACs does not appear to change the risks of bleeding or risk of transfusion

• Antiplatelet drugs appear to increase blood loss and transfusion risk

• Unclear if this trend continues for hip fracture patients requiring arthroplasty.
References


Questions?