Effect of Pre-operative Rivaroxaban Use on the Treatment of Femur Fractures for Patients 65 years and Older

Daren McCalla, MD, Aaron Roberts, MD, Alexander Brown, MD, Jason Lipof, MD, Kyle T. Judd, MS, MD, FACS

University of Rochester Medical Center
Department of Orthopaedic Surgery

2016 IGFS Annual Meeting
October 5, 2016
National Harbor, MD
Disclosures

- Dr. Kyle Judd, MS, MD, FACS
  - No disclosures
- Dr. Daren McCalla, MD
  - No disclosures
- Dr. Alexander Brown, MD
  - No disclosures
- Dr. Aaron Roberts, MD
  - No disclosures
- Dr. Jason Lipof, MD
  - No disclosures
Background

- Oral anticoagulation (OAC) therapy is common in geriatric fracture populations

- Incidence of hip fractures expected to increase
  - By 2030, estimated 6.3 million/year worldwide

- Atrial fibrillation and venous thromboembolism are increasingly prevalent
  - 1% in general population, 5% in age >65, and ~10% in age >85
Background

- Prevalence of OAC use is increasing
  - From 1994-2003, OAC use in patients with AF in UK increased ~twofold

- Non vitamin K antagonist or novel OAC (nOAC) are also approved for use and increasing in prevalence
Background

- Geriatric femur fractures are considered urgent in nature

- Reversal of anticoagulation often delays operative intervention in urgent/emergent settings
Hypothesis I:
- Patients who are anticoagulated at the time of fracture will experience greater delay to treatment when compared to those whom are not anticoagulated

Hypothesis II:
- Patients being treated with a nOAC will have significantly different time to operative treatment (TOT), length of stay (LOS), transfusion rates and 30 day mortality when compared to those on traditional OAC therapy
Methods

- CPT codes used to identify patients undergoing operative treatment for proximal femur fractures

- Retrospective Chart Review
  - Presence of OAC treatment
  - Demographical data
  - Time to operative treatment
  - Transfusion rate
  - Admission hgb/hct
  - Length of stay
  - 30-day mortality
Results

- 185 patients were reviewed
- No significant differences in baseline characteristics between groups

<table>
<thead>
<tr>
<th></th>
<th>Control (n=97)</th>
<th>Warfarin (n=49)</th>
<th>Plavix/ASA (n=29)</th>
<th>Rivaroxaban (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (yrs)</td>
<td>83</td>
<td>87</td>
<td>84</td>
<td>81</td>
</tr>
<tr>
<td>Gender (M:F)</td>
<td>15:82</td>
<td>16:33</td>
<td>10:19</td>
<td>10:0</td>
</tr>
<tr>
<td>Admit H/H</td>
<td>12/37</td>
<td>12/36</td>
<td>11/35</td>
<td>11/34</td>
</tr>
</tbody>
</table>
Results

Time from Admission to Operative Treatment

- Control: 21.4 hours
- Warfarin: 28.2 hours
- Antiplatelet: 20.5 hours
- Rivaroxiban: 22.6 hours

Preoperative Anticoagulation Therapy
Results

Transfusion Rates Following Hip Fracture Surgery

<table>
<thead>
<tr>
<th>Preoperative Anticoagulation Therapy</th>
<th>% of Patients receiving blood transfusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>50.50%</td>
</tr>
<tr>
<td>Warfarin</td>
<td>44.90%</td>
</tr>
<tr>
<td>Antiplatelet</td>
<td>58.60%</td>
</tr>
<tr>
<td>Rivaroxiban</td>
<td>90%</td>
</tr>
</tbody>
</table>
Results

Length of Stay Following Hip Fracture Surgery

- Control: 5.6 days
- Warfarin: 7 days
- Antiplatelet: 6.7 days
- Rivaroxiban: 6.7 days
Results

30-Day Mortality Following Hip Fracture Surgery

- Control: 4.6%
- Warfarin: 20.4%
- Antiplatelet: 6.9%
- Rivaroxiban: 0%
Conclusions

- Treatment with nOAC (Rivaroxiban) does NOT lead to significant delay in treatment in our cohort.

- Greatest delay to treatment was seen in patients taking warfarin at the time of fracture.

- Treatment with Rivaroxiban does not increase 30 day mortality above that of cohorts.

- Patients on Rivaroxaban appear to have transfusion rates twice those of their cohorts.
Limitations

- Small numbers of patients on nOACs
- Did not stratify by fracture pattern or surgical fixation method
- Did not identify cause of mortality
References


5 Calderia, D, et al. Non-vitamin K antagonist oral anticoagulants and major bleeding-related fatality (abbr.) Heart. 2015; 101:1204-1211