Increased Bleeding Risk with Enoxaparin Venothromboembolism Prophylaxis Compared with Heparin in Patients Undergoing Bariatric Surgery

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BACKGROUND

• Rates of venothromboembolism (VTE) after bariatric surgery are 0.3% to 3.5%.
• Fatal pulmonary embolism (PE) occurs 0.2% to 0.4% of the time but is the cause of up to half of deaths after bariatric surgery.
• Perioperative VTE chemoprophylaxis is an established tenant of bariatric surgery.
• Few data exist comparing efficacy and bleeding risk of VTE prophylaxis.
• In 2012 the Michigan Bariatric Surgery Collaborative found enoxaparin to be better than heparin for VTE prophylaxis.

RESEARCH OBJECTIVES

• Determine if an institutional change in VTE prophylaxis from heparin to enoxaparin was associated with differing rates of postoperative bleeding and VTE occurrence after bariatric surgery.

METHODS

• Retrospective cohort study using a clinical database maintained by a trained surgical clinical reviewer as well as data from the Northwestern Enterprise Data Warehouse.
• 18 years or older.
• Primary bariatric surgery (sleeve gastrectomy [SG] or Roux-en-Y gastric bypass [RYGB]).
• March 2012 – December 2021.

RESULTS

• 2,159 patients underwent bariatric surgery.

<table>
<thead>
<tr>
<th>Complications</th>
<th>Heparin</th>
<th>Enoxaparin</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postoperative Bleed</td>
<td>0.9</td>
<td>26</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Postoperative Transfusion</td>
<td>0.9</td>
<td>26</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Return to OR for Bleed</td>
<td>0.2</td>
<td>7</td>
<td>0.041</td>
</tr>
<tr>
<td>VTE Occurrence</td>
<td>1.1</td>
<td>7</td>
<td>0.613</td>
</tr>
</tbody>
</table>

- The ratio of SG to RYGB was not different in the two VTE prophylaxis groups.
- Controlled for age, race, Hispanic ethnicity, and hypertension (which were significant on univariate analyses).

LIMITATIONS

• Single-center retrospective review.
• Use of other medications might have influenced bleeding risk.
• Sample size may be too small to detect small differences in VTE occurrences.
• GI bleeding events that did not require transfusion or reoperation were not captured so the bleeding rate may be underestimated.

An institutional change from heparin to enoxaparin was associated with a significant increase in postoperative bleeding with no difference in VTE complications.

Further studies examining the specific dosing and timing of varying VTE prophylaxis regimens are needed to clarify the optimal regimen for minimizing bleeding while protecting against VTE after bariatric surgery.