TEG demonstrates that tinzaparin 4500 units has no detectable anticoagulant activity after caesarean section

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Background
Background

“Neuraxial blockade should not be performed until 10-12 hours after a thromboprophylactic dose of low molecular weight heparin”
Background
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Hypotheses

1. TEG will detect the effect of a thromboprophylactic dose of tinzaparin

2. Peak effect on r time prolongation will occur at 4 hours post dose

3. Tinzaparin will no longer be detected by TEG at 10 hours post dose
Methods

Blood sampling pre-dose & at 4, 8 & 10 hrs post tinzaparin
Methods

Kaolin activated sample inverted 5 x

Paired plain & heparinase samples pre-dose & at 4, 8 & 10 hrs post tinzaparin

Standard TEG values recorded
Results

- Heparinase $P = 0.47$
- Time $P = 0.75$

Mean (SD)
Results

**MA**

Heparinase $P=0.11$

Time $P=0.0053$

**k time**

Heparinase $P=0.20$

Time $P=0.11$
Results

Thromboprophylactic Level

Anti-Xa Level (units/mL)

Patient Number

Anti-Xa Levels (4 hrs)
Anti-Xa Levels (8 hrs)
Anti-Xa Levels (10 hrs)
Conclusions

1. TEG did not detect the effect of tinzaparin on anticoagulation at any time point

and ...

2. Tinzaparin was also not detectable in this group of patients by anti-Xa assay
Macafee B, Campbell JP, Ashpole K, Cox M, Matthey F, Acton L, Yentis SM

Reference ranges for thromboelastography (TEG) and traditional coagulation tests in term parturients undergoing caesarean section under spinal anaesthesia

Anaesthesia 2012; 67: 741-747
Why?

- Difference in anti-Xa activity between different types of low molecular weight heparin

<table>
<thead>
<tr>
<th>Product</th>
<th>Xa: IIa ratio</th>
<th>Mol. Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heparin</td>
<td>1.9: 1</td>
<td>11,400</td>
</tr>
<tr>
<td>Ardeparin</td>
<td>2.7: 1</td>
<td>6000</td>
</tr>
<tr>
<td>Dalteparin</td>
<td>3.8: 1</td>
<td>5819</td>
</tr>
<tr>
<td>Enoxaparin</td>
<td>3.6: 1</td>
<td>4371</td>
</tr>
<tr>
<td>Nadroparin</td>
<td>3.5: 1</td>
<td>4855</td>
</tr>
<tr>
<td>Reviparin</td>
<td>1.9: 1</td>
<td>4653</td>
</tr>
<tr>
<td>Tinzaparin</td>
<td>1.9: 1</td>
<td>4500</td>
</tr>
</tbody>
</table>
Why?

- TEG not sensitive enough to detect a tinzaparin effect - unlikely

- Under dosing of tinzaparin for this population
Summary

• Tinzaparin 4500 units has no detectable effect on anticoagulant activity after caesarean section as assessed by TEG or anti-Xa levels.

• These findings support consensus guidelines which state that it is acceptable to perform neuraxial block insertion at 10-12 hrs post thromboprophylactic tinzaparin.