Understanding the Mechanism and Chemical Properties of Tranexamic Acid and Its Applications in Orthopedics, Specifically Trauma Patients

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My disclosure is in the Final AOFAS Mobile App. I have no potential conflicts with this presentation.
Background

- Tranexamic acid (TXA) is a safe and cost effective antifibrinolytic agent
- Utilized for decades during surgical procedures to minimize blood loss
- Early administration of TXA in trauma patients have decreased mortality rates and need for blood product transfusion
- No increase in thrombolytic events
- TXA well documented in the orthopaedic literature as being efficacious in decreasing blood loss during total knee arthroplasty.
**Materials + Methods: CRASH-2**

<table>
<thead>
<tr>
<th>All Patients</th>
<th>Mortality post TXA Administration</th>
<th>Mortality post Placebo Administration</th>
<th>Risk Ratio (99% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20,211</td>
<td>1463/10,060 (14.5%)</td>
<td>1613/10,067 (16.0%)</td>
<td>0.91 (0.85 to 0.97)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2p= 0.0035</td>
</tr>
</tbody>
</table>
### Materials + Methods: MATTERs

<table>
<thead>
<tr>
<th>Total patients admitted to Camp Bastion with combat injuries requiring transfusion</th>
<th>Received TXA</th>
<th>Did not receive TXA</th>
</tr>
</thead>
<tbody>
<tr>
<td>896</td>
<td>293</td>
<td>603</td>
</tr>
<tr>
<td>Received TXA and massive transfusion</td>
<td>125</td>
<td>196</td>
</tr>
</tbody>
</table>
Materials + Methods: Meta-analysis review reduction in blood loss w/ TXA

<table>
<thead>
<tr>
<th></th>
<th>TKA w/ TXA</th>
<th>THA w/ TXA</th>
<th>Major Orthopedic Surgery w/ THA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yang et al</td>
<td>-504.90 mL p&lt;0.00001 95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhou et al</td>
<td>-305.27 mL p&lt;0.001 95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Huang et al</td>
<td></td>
<td></td>
<td>-408.33 mL p&lt;0.00001 95% CI</td>
</tr>
</tbody>
</table>
Results

TXA is most efficacious when given within an hour of injury and to those patients with more severe injuries with the highest concern for hemorrhage and hyperfibrinolysis.
Conclusion

XA leads to statistically significant decrease in blood loss in both trauma and orthopedic settings and could be beneficial in the field of trauma orthopedic
References