In defense of early prophylaxis...

Venous thromboembolism prophylaxis in traumatic brain injury

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March 28, 2013
240,000 Americans hospitalized for TBI annually\(^1\)

Without prophylaxis 130,000 develop DVT

Post-Thrombotic Syndrome seen in 40,000

Nearly 4,000 new patients annually with severe PTS: quality of life lower than age-matched patients with angina, cancer, & CHF\(^3\)
CONSISTENT EVIDENCE SUGGESTS THAT EARLY VTE PROPHYLAXIS IN HEAD INJURY IS SAFE
THE BENEFITS OF EARLY VTE PROPHYLAXIS FAR OUTWEIGH THE RISK OF PROGRESSION OF INTRACRANIAL HEMORRHAGE
Timing of Pulmonary Embolism After Traumatic Injury$^4$
Timing of Intracranial Hemorrhage Progression after Traumatic Injury

![Graph showing the timing of ongoing hemorrhage over time.](image-url)
SYSTEMATIC REVIEW

0 randomized trials
1 prospective observational (no control group)
3 retrospective cohort (early vs late)
2 retrospective review (1 early vs late, 1 early vs none)
1 descriptive study
<table>
<thead>
<tr>
<th>AUTHORS (yr)</th>
<th>METHODS</th>
<th>N</th>
<th>GROUPS</th>
<th>VTE RESULTS</th>
<th>INCREASE ICH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kim 2002⁶</td>
<td>Retrospective Cohort</td>
<td>64</td>
<td>EARLY = UFH&lt;72hrs LATE = UFH&gt;72hrs</td>
<td>EARLY: 8.7% LATE: 5.9%</td>
<td>none</td>
</tr>
<tr>
<td>Depew 2008⁷</td>
<td>Retrospective Cohort</td>
<td>124</td>
<td>EARLY = ppx&lt;72hrs LATE = ppx&gt;72hrs</td>
<td>EARLY: 14% LATE: 11%</td>
<td>EARLY: 3.4% LATE: 3.8%</td>
</tr>
<tr>
<td>Norwood 2008⁸</td>
<td>Prospective Observational</td>
<td>525</td>
<td>Enoxaparin &lt;48hrs</td>
<td>1.4% DVT, no PE</td>
<td>3.4%</td>
</tr>
<tr>
<td>Dudley 2010⁹</td>
<td>Retrospective Review</td>
<td>287</td>
<td>Dalteparin&lt;72hrs Enoxaparin&lt;72hrs</td>
<td>Dalteparin: 7.5% Enoxaparin: 7%</td>
<td>0.35%</td>
</tr>
<tr>
<td>Koehler 2011¹⁰</td>
<td>Retrospective Cohort</td>
<td>669</td>
<td>EARLY enox&lt;72hrs LATE enox&gt;72hrs</td>
<td>EARLY: 6.7% LATE: 12.4%</td>
<td>EARLY: 1.5% LATE: 1.5%</td>
</tr>
<tr>
<td>Salottolo 2011¹¹</td>
<td>Retrospective Review</td>
<td>255</td>
<td>EARLY:LMWH&lt;72hr LATE:LWMH&gt;72hrs</td>
<td>EARLY: 5.6% LATE: 2.7%</td>
<td>EARLY: 6.5% LATE: 14%</td>
</tr>
<tr>
<td>Scudday 2011¹²</td>
<td>Retrospective Review</td>
<td>812</td>
<td>PPX &lt;72hrs vs none</td>
<td>PPX 1%/none 3%</td>
<td>PPX 3%/no 6%</td>
</tr>
</tbody>
</table>

*Meta-Analysis 2284 1666 EARLY 618 LATE* | EARLY: 3.8% LATE: 9.9% | EARLY: 3.1% LATE: 4.7% |
DECISION ANALYSIS

Assumptions:
Incidence of TBI 240,000\(^1\)
Probability of VTE and ICH progression as calculated
  Mortality from VTE = 0.01, from ICH progression = 0.1\(^{13}\)
Mortality

ICH progression

VTE

PPX

TBI

240,000 annually

EARLY (<72hrs)

Yes

9,600

No

230,400

LATE (>72hrs)

Yes

24,000

No

216,000

VTE

Yes

9,600

No

230,400

ICH progression

EARLY

Yes

288

No

288

LATE

Yes

9,312

No

1,200

Mortality

EARLY

730

LATE

1,200
SUMMARY

- Risk of progression of ICH is short lived, while risk for VTE persists.
- Multiple retrospective studies have shown that LMWH given within 72hrs of ICH is just as safe as delayed prophylaxis.
- Overall, early VTE prophylaxis saves nearly twice as many lives due to fatal PE than late prophylaxis would save from halting ICH progression.
THANK YOU!
REFERENCES