Efficacy of Nebulized Tranexamic Acid for Severe Hemoptysis at a Tertiary Academic Medical Center

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Background
- The management of severe hemoptysis mainly consists of invasive interventional procedures, such as angiographic bronchial artery embolization or various endobronchial interventions.
- There are limited non-invasive medical therapies available for the management of hemoptysis.
- Small studies show benefit with nebulized tranexamic acid (TXA), leading to a faster time to hemoptysis resolution and decreased need for invasive interventions.
- The objective of this analysis was to evaluate the efficacy and safety of nebulized TXA administration compared to conventional management in patients with hemoptysis.

Methods
Design
- Single-center, retrospective, matched cohort study
- All patients with documented hemoptysis (ICD-10 R04.2) within the health record between January 1, 2018 - March 31, 2021.
- Coarsened exact matching (CEM) was used to match up to 5 controls for all patients who received inhaled TXA based on the following severity criteria:
  - Hemoptysis classification:
    - scant (< 5 ml/mild 5 - 30 ml), moderate > 30 ml
  - Respiratory support:
    - noninvasive ventilation, mechanical ventilation, none
  - SDFA score at the time of hemoptysis diagnosis

Major endpoints
- Need for invasive interventions for the management of hemoptysis
  - Interventional bronchoscopy
  - Angiographic embolization
- Invasive surgical management

Minor endpoints
- Time to hemoptysis resolution
- Hemoptysis recurrence
- Duration of mechanical ventilation
- Intensive care unit (ICU) and hospital length of stay (LOS)
- Stroke
- Seizure

Statistics
- Data were analyzed using IBM SPSS Statistics (Version 27) software
- Continuous data were compared using Students’s t-test (parametric) or Mann-Whitney U test (non-parametric)

Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (n = 80)</th>
<th>TXA (n = 15)</th>
<th>Control (n = 65)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoptysis classification</td>
<td>70 (87.5)</td>
<td>15 (100)</td>
<td>55 (84.6)</td>
<td>0.720</td>
</tr>
<tr>
<td>Mild</td>
<td>6 (7.5)</td>
<td>1 (6.7)</td>
<td>5 (7.7)</td>
<td>0.655</td>
</tr>
<tr>
<td>Moderate</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1.000</td>
</tr>
<tr>
<td>Severe</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1.000</td>
</tr>
<tr>
<td>Required respiratory support</td>
<td>66 [51:72]</td>
<td>39 (60.0)</td>
<td>27 (41.5)</td>
<td>0.036</td>
</tr>
<tr>
<td>Mechanical ventilation</td>
<td>5 (33.3)</td>
<td>3 (20)</td>
<td>2 (3.1)</td>
<td>0.079</td>
</tr>
<tr>
<td>Required sedation</td>
<td>88.5 [69.8:106.1]</td>
<td>70.3 [55.3:104.3]</td>
<td>53.3 [20]</td>
<td>0.048</td>
</tr>
</tbody>
</table>

Results (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>TXA</th>
<th>Control</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to hemoptysis resolution</td>
<td>95.5</td>
<td>36</td>
<td>0.061</td>
</tr>
<tr>
<td>Duration of MV (hours)</td>
<td>215 [22.5:227.3]</td>
<td>165 [16.5:77.6]</td>
<td>0.111</td>
</tr>
<tr>
<td>ICU LOS (days)</td>
<td>8.6 [1.8:19.5]</td>
<td>5.9 [2.4:18.7]</td>
<td>0.810</td>
</tr>
</tbody>
</table>

Limitations
- Single-center, retrospective, observational study
- Unmeasured confounders may have impacted matching technique and patient selection
- Cessation of hemoptysis difficult to capture due to the retrospective nature and reliance on documentation

Conclusion
- Inhaled TXA did not have an impact on the requirement of invasive management for severe hemoptysis, however, no increase in adverse events was observed in the TXA group. Larger sample sizes may be warranted to determine the true impact of nebulized TXA for hemoptysis

References