Prophylactic Administration of Steroids and the Effect on Post-extubation Stridor: A Scoping Review

Chelsey Benson, BSN, RN; Karlene Ferraro, BSN, RN
Faculty Advisor - Donna Lynch-Smith, DNP, ACNP-BC, NE-BC, CNL
College of Nursing - The University of Tennessee Health Science Center - Memphis, TN

Purpose
The purpose of this DNP project is to answer the following question:

In an adult ICU setting, does the administration of prophylactic steroids decrease the occurrence of stridor and the need for reintubation?

Specific aims:
- Examine clinical and statistical significance of primary outcomes related to a decrease in the occurrence of stridor and the need for reintubation.
- Examine clinical and statistical significance of secondary outcomes related to the duration of mechanical ventilation and subsequent decrease in length of ICU stay.
- Identify the importance of this project in relation to nurse practitioner implications.
- Identify areas of opportunity to conduct more research.

Methods

Study design:
- A scoping review

Critical appraisal of all considered articles in literature search between November 2019 and October 2021, resulting in 11 articles total.

Study population:
- We included only studies conducted in an intensive care unit (ICU) setting involving mechanically ventilated adults.
- Secondary outcomes are also examined including: success in weaning patients from the ventilator, decrease in overall time spent on the ventilator, and decrease in length of ICU stay.

Data collection process:
- We screen each article for study type (level of evidence), sample size, age, cuff-leak testing, administration of steroids, development of post-extubation stridor, and instance of re-intubation.

Data synthesis:
- A table of results was then constructed to compare the outcomes of utilizing prophylactic steroids versus administering no steroids.

Results

<table>
<thead>
<tr>
<th>Study (year)</th>
<th>Study type</th>
<th>Sample size (n)</th>
<th>Sample age (mean ± SD)</th>
<th>Average duration of GS (days)</th>
<th>Steroid</th>
<th>Cuff leak testing</th>
<th>Percentage of patients who experienced an event</th>
<th>Events in group (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baloch et al. (2010)</td>
<td>Randomized controlled trial</td>
<td>2597 (1140/1457)</td>
<td>59.7 ± 17.6</td>
<td>7.7 ± 3.2</td>
<td>Yes</td>
<td>Yes</td>
<td>10.6%</td>
<td>102 (89/113)</td>
</tr>
<tr>
<td>Jaber et al. (2009)</td>
<td>Randomized controlled trial</td>
<td>1846 (419/1504)</td>
<td>65.5 ± 14.8</td>
<td>7.7 ± 3.3</td>
<td>Yes</td>
<td>Yes</td>
<td>43%</td>
<td>92 (37/96)</td>
</tr>
<tr>
<td>Jaber et al. (2009)</td>
<td>Randomized controlled trial</td>
<td>7299 (2597/2702)</td>
<td>51.1 ± 16.4</td>
<td>7.7 ± 3.1</td>
<td>Yes</td>
<td>Yes</td>
<td>45%</td>
<td>341 (134/207)</td>
</tr>
<tr>
<td>Kuriyama (2007)</td>
<td>Randomized controlled trial</td>
<td>1923 (419/1504)</td>
<td>50.0 ± 17.2</td>
<td>7.7 ± 3.2</td>
<td>Yes</td>
<td>Yes</td>
<td>50%</td>
<td>95 (43/52)</td>
</tr>
<tr>
<td>Fan et al. (2008)</td>
<td>Randomized controlled trial</td>
<td>195 (41/154)</td>
<td>67.7 ± 15.3</td>
<td>7.7 ± 3.5</td>
<td>No</td>
<td>No</td>
<td>45%</td>
<td>9 (8/1)</td>
</tr>
<tr>
<td>Baloch et al. (2010)</td>
<td>Randomized controlled trial</td>
<td>195 (41/154)</td>
<td>67.7 ± 15.3</td>
<td>7.7 ± 3.5</td>
<td>No</td>
<td>No</td>
<td>50%</td>
<td>10 (9/1)</td>
</tr>
</tbody>
</table>

Implications for Practice

- As future acute care nurse practitioners, many of us will be treating patients in an intensive care unit setting where we will frequently be assessing patients for ventilator weaning readiness and extubation.
- It is important to provide the most effective evidence-based care for our patients.
- The prophylactic administration of steroids can help decrease the incidence of reintubation due to post-extubation stridor.
- While the use of steroids remains a topic of controversy among healthcare professionals, the evidence supports the implementation of prophylactic steroids to decrease the risk of complications associated with prolonged intubation, laryngeal edema, and decrease the total length of ICU stay.
- Based on the scoping review we performed, we recommend the prophylactic administration of steroids to prevent post-extubation stridor in high-risk patients.
- Opportunities for further research on this topic could include a protocol for prophylactic steroid dosing and frequency of administration.

References