Evaluation of dexmedetomidine effects on duration of mechanical ventilation and intensive care unit length of stay compared to midazolam and propofol

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Background

• Mechanical ventilation in the Intensive Care Unit (ICU) is often associated with increased length of stay in the ICU, patient readmissions, and complications.1,2
• Mechanically ventilated patients are usually sedated using medications to reduce discomfort, increase tolerance of mechanical ventilation, prevent accidental removal of instrumentation, and to reduce metabolic demands during cardiovascular and respiratory instability.3
• Historically at St. Claire Regional (SCR), propofol and midazolam have been the sedative agents of choice for mechanically ventilated patients in the ICU.
• Dexmedetomidine has some evidence to support its ability to produce lighter levels of sedation, but evidence on whether or not this translates into shorter intensive care unit stays or duration of mechanical ventilation remains mixed.3
• Dexmedetomidine was added to SCR formulary to provide physicians with the option of using the medication for patients.
• SCR is interested in the impact dexmedetomidine use has on mechanically ventilated patients and length of ICU stay

Objective

• Primary
Evaluate the duration of mechanical ventilation and length of ICU stay in patients sedated with dexmedetomidine against mechanically ventilated patients sedated with either propofol or midazolam.
• Secondary
Identify any difference in incidence of ventilator associated pneumonia and delirium between the study groups.

Methods

• A retrospective review of patients receiving either midazolam or propofol for sedation while mechanically ventilated was conducted for October 2013 through April 2014.
• A prospective review will be conducted on patients receiving dexmedetomidine for sedation while mechanically ventilated for October 2014 through April 2015.
• Patient information was obtained from electronic patient records kept on the hospital’s database.

Results

<table>
<thead>
<tr>
<th></th>
<th>Midazolam n = 28</th>
<th>Propofol ± Midazolam n = 21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ± SD</td>
<td>63.28 ± 14.2</td>
<td>59.1 ± 13.7</td>
</tr>
<tr>
<td>Age range</td>
<td>34 – 96</td>
<td>23 – 70</td>
</tr>
<tr>
<td>Male</td>
<td>12 (43%)</td>
<td>9 (42.9%)</td>
</tr>
<tr>
<td>Weight (kg) ± SD</td>
<td>88.8 ± 31.5</td>
<td>76.1 ± 18.4</td>
</tr>
<tr>
<td>Mean duration of mechanical ventilation ± SD (hrs)</td>
<td>138.76 ± 149.42</td>
<td>107.69 ± 82.44</td>
</tr>
<tr>
<td>Mechanical ventilation range (hrs)</td>
<td>24 – 656.75</td>
<td>29.58 – 280.17</td>
</tr>
<tr>
<td>Mean ICU length of stay ± SD (hrs)</td>
<td>244.6 ± 194.98</td>
<td>178.38 ± 107.77</td>
</tr>
<tr>
<td>ICU length of stay range (hrs)</td>
<td>52.27 – 661.07</td>
<td>36.68 – 465.83</td>
</tr>
<tr>
<td>Incidence of VAP</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Incidence of Delirium</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Discussion

• The data collected for the retrospective cohort was fairly close to the medians and means of previous trials for duration of mechanical ventilation and ICU length of stay for midazolam and propofol.
• In the MIDEX trial, the median duration of mechanical ventilation for midazolam was 164 hours with a range of 92-380 and the median ICU length of stay was 243 hours with a range of 140-630.4
• In Ruokonen’s dexmedetomidine versus standard care , standard of care being propofol ± midazolam, standard of care had a median duration of mechanical ventilation of 110.6 hours.5
• Data collected for dexmedetomidine will be compared to the patient data collected for midazolam and propofol ± midazolam to identify any differences in the primary and secondary endpoints.

References


Disclosure

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have direct or indirect interest in the subject matter of this presentation:
• Travis Nash: Nothing to disclose
• Cathy Shely: Nothing to disclose
• Samuel Wornall: Nothing to disclose
• Abigail Hay: Nothing to disclose

Additional Information

- Dexmedetomidine during Long Term Sedation in the ICU: Dexmedetomidine versus midazolam or propofol: a randomized controlled trial. Intensive Care Med. 2012;38:1131–1138