Medication Use Evaluation of Sugammadex in a Community Hospital

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Background

- Acetylcholinesterase inhibitors such as neostigmine or edrophonium have been standard of care reversal agents for paralysis secondary to neuromuscular blockade (NMB) induced by non-depolarizing agents.¹,²
  - Adverse cholinergic effects and slow/incomplete reversal:
    - Delayed or unsuccessful extubation
  - Residual paralysis³,⁴
- Sugammadex is a cyclodextrin molecule that binds steroidal neuromuscular blocking agents rocuronium and vecuronium
  - Rapid decrease in serum levels of rocuronium or vecuronium
  - No cholinergic adverse effects
- FDA labeled indications:
  - Reversal of rocuronium or vecuronium induced NMB in adult surgical patients
  - Rescue during emergent cannot intubate cannot ventilate (CICV) situations
- Approved sugammadex dosing is based on actual body weight (ABW) and is dependent upon depth of NMB as measured by the train-of-four (TOF):³
  - Moderate (TOF > 2 twitches) → 2 mg/kg
  - Deep (TOF < 2 twitches) → 4 mg/kg
  - Emergent CICV situations → 16 mg/kg

Objective

- Evaluate sugammadex prescribing and dosing habits for compliance with FDA approved indications at Memorial Hermann Memorial City Medical Center

Methods

Study Design:
- This is a single-center, retrospective chart review of adult patients who received at least one dose of sugammadex at Memorial Hermann Memorial City Medical Center from October 2016 to December 2016.

Definitions:
- Clinically appropriate use:
  - Surgical patients who received rocuronium or vecuronium prior to sugammadex administration
- Clinically appropriate dosing:
  - Doses based on ABW
  - Could be rounded to nearest ± 50 mg increment
  - Pre-dose TOF within 1 hour of dose

Results

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Variable</th>
<th>n = 68</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years, mean</td>
<td>53.7</td>
<td></td>
</tr>
<tr>
<td>Sex, female, n (%)</td>
<td>50 (74)</td>
<td></td>
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<tr>
<td>Actual Body Weight, kg, mean ± SD</td>
<td>88 (31)</td>
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</tbody>
</table>

Surgical Characteristics

- Laparoscopic surgery, n (%) | 38 (56)
- Length of Anesthesia, min, mean ± SD | 144 (97)

Paralysis and Reversal

- Rocuronium or Vecuronium, n (%) | 68 (100)
- Concurrent paralytic, n (%) | 37 (54)
- Prior neostigmine, n (%) | 15 (22)

Figure 1. Dose of Sugammadex, n = 68
Figure 2. Appropriateness of Dose, n = 68
Figure 3. Appropriateness of Dose by Weight, n = 68

Conclusions

- Use of sugammadex at this institution was exclusively within the approved patient population
- Almost half of the doses utilized were deemed inappropriate by study criteria with another large proportion being indeterminate due to inconsistent documentation
- Sugammadex was commonly rounded to the nearest vial (200mg) which caused underdosing in larger patients and overdosing in smaller
- Further education may be required to ensure for the proper weight based dosing and documentation of TOF in this institution

References

3. BRIOSIN(R) Intravenous Injection, sugammadex intravenous injection. Merck Sharp & Dohme Corp. (per FDA); Waltham, MA, 2015.

Disclosures