PHARMACY TO DOSE
THE CRITICAL CARE PODCAST

Rapid Sequence Intubation Show Notes

Special Guest: Haley Peters, PharmD, BCCCP

I. Overarching considerations
   a. Ultimate goal is "First pass success"
      i. Ensure providers are comfortable with medications we're recommending and using
      ii. Work with team to determine the safest approach for the airway (e.g., RSI v. awake)
   b. Then focus on what is the best for the patient
      i. Provide adequate sedation for the patient post-intubation
   c. Give induction agents prior to neuromuscular blockade
II. Neuromuscular blockade
   a. Depolarizing v. Non-depolarizing
      i. Depolarizing – Acetylcholine receptor agonist, which causes the action potential
         1. Action potential occurs, seen clinically as fasciculations, then paralysis follows
      ii. Non-depolarizing – Acetylcholine receptor competitive antagonists, binding to the receptor for a longer period of time
         1. Don't get the fasciculations you see with depolarizing NMBA
   b. Succinylcholine
      i. Depolarizing NMBA that is short acting with a rapid onset
         1. Useful in situations where long-term paralysis isn't ideal
            a. Difficult airway
            b. Young, head injury trauma patients where neuro exam is needed ASAP
            c. Status epilepticus?
      ii. Not a perfect agent as succinylcholine has some less desirable ADE
         1. Hyperkalemia (depolarization causes K shift): Increase ~0.3-0.5 mmol/L
         2. Malignant hyperthermia
   c. Rocuronium and Non-Depolarizing NMBA
      i. Longer acting agents
      ii. Biggest difference is the onset of action between rocuronium and other non-depolarizing NMBA
   d. Pharmacist considerations with bag-valve mask ventilation ("bagging the patient")
      i. Think about sedation and know how long it lasts, especially if the sedative has a shorter duration than the paralytic
         1. Be proactive and ask, because the medical team is likely thinking about other important things
   e. NMBA Reversal in RSI
      i. If this is an emergent airway, you likely still need to intubate the patient
      ii. Try to focus on giving sedation rather than reversing their NMBA

f. Non-depolarizing dosing
    i. Try to create an environment where you can pre-oxygenate the patient
    ii. Doesn't necessarily fit into the general RSI flow
        1. Patient may become completely paralyzed with the smaller dose and then the team isn't ready to intubate

III. Pre-induction agents
a. May only give these in a delayed sequence or awake intubation
b. Fentanyl
    i. Indicated to blunt the sympathetic response
        1. Sympathetic response results from the ET tube going into the patient's throat
    ii. Typically give standard pain doses, avoid doses > 100 mcg
c. Lidocaine
    i. Indicated to prevent vagal nerve stimulation (which can create coughing)
        1. Not blunting gag reflex, but cough reflex
        2. May be beneficial in patients with elevated ICP
    ii. Dosing is generally 1.5 mg/kg IV but can also use 4% inhaled lidocaine to numb the area
    iii. Avoid in patients with known cardiac/rhythm disturbances
d. Esmolol
    i. Indicated to blunt the sympathetic response
        1. May be useful in a patient with a type A dissection or acute aortic dissection where a spike in the BP may be catastrophic
    ii. Dosing: 1000-2000 mcg/kg given 3 min prior to intubation
        1. Has the potential for errors related to dosing or timing

IV. Induction agents
a. Properties to consider when picking an induction agent:
    i. Drug-specific properties: Analgesic? Amnestic? Hemodynamic Effects?
    ii. Pharmacokinetic properties: Time to onset and duration of action
b. Etomidate
    i. Generally considered hemodynamically neutral
        1. BP dropping likely is a result of blocking the patient's sympathetic response
    ii. Dose: 0.3 mg/kg
    iii. Is amnestic, has no analgesic properties, and has a short duration of action
        1. Be ready with post-intubation sedation
    iv. Can interfere with cortisol production but won't see any potential adverse effects from this (e.g., adrenal insufficiency) for 24-48 hours
c. Propofol
    i. Dose: 1-2 mg/kg
        1. Can't use smaller doses in RSI since we are rapidly giving the neuromuscular blocker immediately afterwards

ii. In volume depleted patients (e.g. sepsis), has a higher incidence of hypotension
    1. Maybe a role in status epilepticus
    2. Commonly used in procedural sedation

d. Midazolam
    i. For monotherapy induction, the dose is very high and may have a higher rate of ADE associated with administration
    ii. Dose: 0.2 mg/kg (20mg for 100 kg patient)

e. Ketamine
    i. Provides analgesia, amnesia, and doesn't cause hemodynamic instability
        1. Doesn't blunt respiratory drive – may be good for awake airways
    ii. Similar onset and closer duration of action with rocuronium
    iii. ADE:
        1. Hypertension/tachycardia – avoid in cardiac emergencies
        2. Hypersalivation – consider pre-treatment with awake intubations

V. Obesity Dosing Considerations
a. Know if the weight is the actual weight (ideally from a weigh bed) compared to an estimated weight
b. Literature shows that as patient weight increases, they have a lower chance of receiving an appropriate paralytic dose
    i. 54% first pass success in patients >120kg who received <1 mg/kg succinylcholine
c. Patient-specific factors such as hemodynamics may play a part in determine if you give the full dose for induction agents (e.g., etomidate)

VI. Difficult Airways
a. LEMON acronym can help identify patients who may have a difficult airway
    i. L – Look externally
    ii. E – Evaluate (geometric assessment)
    iii. M – Mallampati score
    iv. O – Obesity/obstruction
    v. N – Neck mobility

VII. Take-home points
a. Leverage your expertise in pharmacokinetics when choosing medications
b. Don't force medications on providers that they aren't comfortable using during emergent airways
c. Don't forget about post-intubation sedation, it's critical
d. Be proactive
e. Ensure all syringes are labeled when brought into the room for safety
f. Educate the team when the time is right