APRIL 2015 VOLUME #2 ISSUE 10

EM CASE OF THE WEEK

BROWARD HEALTH MEDICAL CENTER DEPARTMENT OF EMERGENCY MEDICINE

In 2011, 3,345 deaths were attributed to asthma. However, deaths due to asthma are rare among children. The number of deaths increases with age. In 2011, 169 children under 15 died from asthma compared to 633 adults over 85

EM CASE OF THE WEEK

EM Case of the Month is a monthly "pop quiz" for ED staff. The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

Ventilation in Critically Ill Asthmatic

A 24 year old male presents to the ED Via EMS with a severe asthma attack. The pt unable to answer questions secondary to his SOB. He appears is diaphoretic and cyanotic. Vital signs are Temp 98.4, HR 104, BP 172/159, RR 40. Which of the following is the preferred induction agent in rapid sequence intubation in asthmatic patients.

A. Ketamine

B. Etomidate

C. Midazolam

D. Propofol

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Induction Agent Doses:

Etomidate	0.2-0.4 mg/kg
Methohexital	1-1.5 mg/kg
Ketamine	1-2 mg/kg IV (2x for IM)
Propofol	1.5-2.5 mg/kg
Thiopental	3-5 mg/kg

Take Home Points

- Slowed Breathing and alterations in consciousness indicating impending respiratory arrest
- No laboratory markers identify patients with near fatal asthma
- BiPAP is not a substitution for endotracheal intubation but can be used in select patients
- Ketamine is an IV dissociative anesthetic with potent bronchodilator effects. Adverse effects include increase airway secretions and emergence reactions

BiPAP and Endotracheal Intubation in Asthma

The correct answer is A. For hemodynamically stable patients with severe bronchospasm requiring intubation, ketamine is preferred for induction because of its bronchodilator properties.

Discussion:

The critically ill asthmatic patient appears agitated, assumes the upright position, and appears to be in severe respiratory distress. The patient may be pale or cyanotic and their speech will be fragmented. Tachypnea, diaphoresis, and accessory muscle use will be evident. Alteration in consciousness and slowed breathing indicate hypercarbia and impending respiratory arrest.

No laboratory markers identify patients with near fatal asthma. Lactic acid levels reflect tissue hypoxemia and anaerobic metabolism, but elevated levels are not predictive of respiratory failure in critically ill asthmatics.

Non-invasive positive pressure ventilation may benefit carefully selected patients. Continuous positive airway pressure improves oxygenation and reduces respiratory muscle fatigue by increasing functional residual capacity and lung compliance as well as providing inflating pressure during inspiration. BiPAP will provide continuous positive airway pressure; however, pressure provided during inspiration is higher than during expiration. BiPAP is well tolerated by children with status asthmaticus and may decrease the need for intubation and mechanical ventilation. The same may be true for adults, but literature is inconclusive. Patient consideration for BiPAP includes alert mental status and intact airway reflex; close monitoring of consciousness and vitals is mandatory. Frequent ABG's will help identify patients that are not responding to therapy.

Endotracheal intubation is required in 2% of all asthma exacerbations; with the exception of apnea or coma, there are no absolute indications for intubation. Exhaustion, hypoxemia, and depression of mental status all mandate prompt intubation. Rapid sequence intubation utilizing induction agents and muscle paralysis is preferred. Ketamine is the preferred agent for induction in the asthmatic patient. Succinylcholine or rocuronium can be used for intubation paralysis. Pretreatment with lidocaine given three minutes prior to ketamine and succinylcholine can help prevent further bronchospasm by upper airways instrumentation and ET tube. After intubation, a benzodiazapine should be given to help keep the patient sedated and prevent ketamine emergence reaction.

If you have a topic you would like to see discussed in a future edition, please send it to Dr. Jason Mansour at jmansourmd@gmail.com

"An investment in knowledge pays the best interest." –Benjamin Franklin