The Effectiveness of Manual Ventilation in Intubated Helicopter EMS Transported Trauma Patients

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Disclosures

• No disclosures

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Background

• Prehospital intubated trauma patients
  – Mode of ventilation varies
  – No evidence to guide decision

Objective

• Effectiveness of BVM ventilation in severely injured trauma patients
• Hypothesized manual ventilation provides adequate support to maintain physiologic ETCO2

Methods

• Prospective, observational, proof of concept study
  – June 2015 to December 2015
• Inclusion criteria
  – Trauma patients endotracheally intubated on scene and transported by HEMS
• Exclusion criteria
  – Interfacility transfers
  – Non-scene calls
  – Supraglottic devices
Results

- 1,466 time points representing 733 minutes of manual ventilation
- 16 males and 4 females
  - All with blunt trauma
  - 17 with head injuries

Results

- 83.6% adequately oxygenated
  - PO2 > 90%
- 48.7% within physiologic ETCO2
  - 34.6% below 35 mmHg
  - 16.7% above 45 mmHg

PO2 versus Cumulative Time Points
Discussion

- Adequate oxygenation occurred the majority of time
- Inadequate ventilation, though, occurred majority of time
  - Hypocapnia twice as often as hypercapnia
    - Primarily due to hyperventilation

Limitations

- No consideration of power
- Small sample size
- Limited demographic variation
- Geographic isolation
- Provider variation
Limitations

- Multisystem trauma
- Obesity
- Transport
- Consideration of other causes of ETCO2 change

Conclusion

- When controlled for hypoxia and outliers, hyperventilation induced hypocarbia is pervasive
- Manual ventilation does not provide adequate ventilatory support