Take Home Messages in Critical Care

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Disclosures
• None

Topics for review
• Sepsis
• Glycemic control
• Mechanical Ventilation
• Sedation
• Delirium

Sepsis
• Systemic inflammatory response syndrome (SIRS)
  • T > 38°C or < 36°C
  • HR > 90
  • RR > 20/min
  • WBC > 10,000 or < 4000 or band > 15%
• Sepsis/SIRS + infection
• Severe sepsis: Sepsis + organ dysfunction
• Septic shock: Sepsis + refractory hypotension
Take home messages summarized:
Early goal-directed therapy

- Early aggressive fluid resuscitation
  - CVP goal 8-12
  - MAP ≥ 65 mmHg
- Early antibiotics
  - Within the first hour of recognition
  - Broad spectrum
- Vasopressors if volume alone inadequate
  - Norepinephrine or dopamine first

Glycemic control in the critically ill

- Targeting < 180 mg/dl resulted in lower mortality then 80-110 mg/dl.
- Severe hypoglycemia, ≤ 40 mg/dl, was observed in the 80-110 mg/dl group (6.8%) vs the < 180 mg/dl (0.5%).
- Presently, tight or “intensive” glucose control is not recommended

Take home messages:
Glycemic control in the critically ill

- According to the Surviving Sepsis Campaign, target serum glucose <150 mg/dl. Avoid hypoglycemia!
- Use IV insulin to control hyperglycemia.

Mechanical Ventilation

- Principle #1: Support while sick
  - Address the goals of ventilation
  - Mode of ventilation is only a means to achieving the goal
- Principle #2: Minimize potential harm
  - Avoid ventilator-associated lung injury
  - Apply good preventive care, i.e. “vent bundle”
- Principle #3: Identify earliest opportunity for extubation
  - “Weaning” is rarely necessary and often causes a delay
  - Spontaneous breathing trial coordinated with sedation management
Lung protective strategy
- Low tidal volume
  - 6 mL/kg
  - Maximum plateau pressure <30 cm H2O
- PEEP
  - Optimal PEEP remains unclear
  - Use PEEP to get adequate oxygenation

“Vent Bundle”: evidence-based practices to improve outcomes for mechanically ventilated patients
- “Appropriate” sedation
- DVT prophylaxis
- Stress ulcer prophylaxis
- Elevation of head of bed > 30°
- Oral care

Mechanical Ventilation
Efficacy and safety of a paired sedation and ventilator weaning protocol for mechanically ventilated patients in intensive care (Awakening and Breathing Controlled trial): a randomised controlled trial

Take home messages summarized: Mechanical ventilation
- Establish goals of ventilation
- First do no harm
- “Vent Bundle”
  - Lung protective strategy
    - Tidal volume 6 mL/kg, Ppl < 30 mmHg, PEEP adjusted to maintain oxygenation
- Identify extubation-readiness
  - Daily spontaneous breathing trial coupled with sedation “holiday”

Sedation
- Titrated to goal with use of validated scales
  - Goals usually include: awake, interactive, calm.
- Choices include:
  - Benzodiazepines
  - Relationship with delirium
  - Propofol
    - Propofol infusion syndrome: Metabolic acidosis, elevated lactate, elevated CPK and myoglobin, hyperlipidemia
  - Dexmedetomidine
    - Expensive but a different kind of sedation

Delirium
- Hallmarks of diagnosis
  - Acute onset, fluctuating (waxing/waning) course
  - Change from baseline mental status
  - Inattention
  - Disorganized thinking
  - Multiple phenotypes: hyperactive, hypoactive, mixed
- Implications for prognosis
  - Associated with 6-month mortality
  - Associated with lasting cognitive impairment
- Treatment is prevention
  - There is no FDA-approved drug for delirium

- Etiology: multifactorial
  - Medication
  - ICU environment
  - Sleep deprivation
  - Medical illnesses
  - Pre-existing condition: age, cognitive decline, sensory impairment, etc.
Brain dysfunction syndrome

- Sedation
- Sleep deprivation
- Medication
- Hypoperfusion
- Metabolic dysregulation
- Medical illness/"septic encephalopathy"