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Outcomes of Sepsis Patients using Noninvasive Cardiac Output Monitoring to Guide Fluid Resuscitation

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Outcomes of Sepsis Patients using Noninvasive Cardiac Output Monitoring to Guide Fluid Resuscitation

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Introduction /Background

- Severe sepsis and septic shock continue to be major healthcare problems in most critical care units.
- Hospitalized patients with sepsis are at high risk for mortality during their stay. Early fluid resuscitation of the septic patient is a mainstay in the early management to improve outcomes (Dellinger, 2013).
- A concern is that patients are not receiving the recommended 30ml/kg due to a concern for fluid overload (Dellinger, 2013).
- The use of a noninvasive cardiac output monitor (NICOM™) has the ability to identify patients who are fluid responsive (i.e. need more fluids) versus those that are not. This monitor may help guide the healthcare team to manage the patient’s fluid balance more effectively.
- The monitor provides continuous readings of the cardiac output, cardiac index, stroke volume, stroke volume index, peripheral vascular resistance and peripheral vascular resistance index (Marik et al., 2011).
- A passive leg raise maneuver or fluid challenge is used to assess the patient’s fluid responsiveness (Marik et al., 2011; Cavallaro et al., 2010).

Specific Aims

- Do critically ill patients with sepsis, severe sepsis, or septic shock who were exposed to the use of a nurse driven protocol for NICOM™ have improved mortality outcomes when compared to similar patients that were not exposed to NICOM™?

Methods

- IRB: April 16, 2014
- Design: Retrospective, matched case-control study.
- Data collection: Chart review.
- Sample:
  - Matched case control
  - Minimum sample size: 200
  - Variables used to match cases and controls: Age, gender, sepsis severity, race, APACHE score, co-morbidities.

Case definition: Adult ICU patients with sepsis, severe sepsis & septic shock who received NICOM-based fluid resuscitation.

Control definition: Adult ICU patients with sepsis, severe, sepsis & septic shock who received fluid resuscitation without the use of NICOM.

Analysis:

- Descriptive statistics and analytical statistics.
- Group comparison tests (Chi-square, T-test or Mann-Whitney U, etc.)
- Multiple logistic regression to determine predictive value of NICOM™ exposure on mortality outcome.

Preliminary Results

- Comparison of APACHE Severity-adjusted Mean Ratios for Hospital Mortality and ICU Mortality by Level of Sepsis

Conclusions

- Study is in the data collection phase.

References


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