Impact of Ejection Fraction on Fluid Overload in Critically Ill Adults with Sepsis or Septic Shock

Phong T. Ly, PharmD1,2, Joeanna Chastain, PharmD, BCPS2, Susan E. Smith, PharmD, BCPS, BCCCP1, Jiayuan Zhang, PharmD1,2, W. Anthony Hawkins, PharmD, BCCCP1,3

1University of Georgia College of Pharmacy, 2Phoebe Putney Memorial Hospital, Albany, Georgia 3Medical College of Georgia at Augusta University,

BACKGROUND

• Heart failure (HF) is a global pandemic that affects over 26 million people worldwide. 1

• Sepsis accounts for almost one quarter of deaths in people with heart failure. 2

• The Surviving Sepsis Campaign recommends at least 30mL/kg crystalloid fluid bolus within 3 hours of diagnosis. 3

• Chronic heart failure puts patients at risk for fluid overload due to compensatory sodium and water retention to maintain perfusion. 4

• Patients hospitalized for heart failure who received up to 2 liters of fluids had increased rates of hospital death and intubation compared to those that only received diuretics. 5

• Fluid overload in critically ill patients is associated with significant increase in mortality, length of hospital stay, and ventilator use. 6

PURPOSE

Are patients with sepsis or septic shock and a reduced left ventricular ejection fraction (LVEF) more likely to develop fluid overload from initial resuscitation?

METHODS

PATIENT POPULATION

International Classification of Diseases 10 codes
- Sepsis
- Sepsis shock

Exclusion:
- Transferred from an outside hospital
- Diagnosed with acute myocardial infarction,
- Left ventricular assist device
- Care withdrawn within 12 hours of sepsis onset

Inclusion:
- < 18 years of age
- Echocardiogram 12 months prior or up to 48 hours after admission
- Admission to the intensive care unit (ICU)

DEFINITIONS

Fluid overload
• 10% or more increase from baseline (weight prior to resuscitation). 6

Shock survival
• Patient who were discharged before day 28 were assumed to be alive on day 28.

Ventilation free survival
• Patient who were discharged without mechanical ventilation were assumed to be vent free through day 28.

OUTCOMES

Incidence of receiving ≥30 mL/kg of fluids at 3 hours
Percent of weight changed at ICU discharge
Incidence of volume overload at discharge from ICU
In hospital all-cause mortality
Total loop diuretic receive in the ICU
Length of ICU stay
Ventilator free survival

REFERENCES


Statistical Analysis

Continuous data:
• Shapiro-Wilk’s test for normality
• Independent Student’s t-test or Wilcoxon rank sum test for analysis

Categorical data:
• Chi square test or Fishers Exact

Sample size:
• 35% of the normal EF group expected to have FO> at ICU discharge
• 394 in each group needed to detect a 20% absolute difference with an α of 0.05 and power of 80%