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# Getting to the Heart of the Matter: What We Know About Fluid Resuscitation in Septic Heart Failure Patients

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## To the Editor:

Perceived volume overload risk in septic patients with heart failure (HF) have led clinicians to adopt conservative fluid approaches but with largely unelucidated ramifications (1).

In their recently published article in *Critical Care Medicine*, Kuttab et al (2) demonstrated the effectiveness of liberal fluid use in the acute resuscitation phase of sepsis: failure to receive 30 mL/kg in 3 hours (30by3) among all patients, including those with HF, increased mortality (odds ratio [OR], 1.52; 95% CI, 1.02–2.24; $p = 0.035$). They also observed substantial disparity in initial resuscitation volume administered to HF and non-HF patients (14.3 vs 30 mL/kg) and that patients with HF had more delayed hypotension (OR, 1.48; 95% CI, 1.02–2.16; $p = 0.038$), a possible consequence of receiving less fluid resuscitation. Although mortality was not associated with achievement (or nonachievement) of 30by3 in septic HF patients (OR, 1.48; 95% CI, 0.68–3.21), the study was notably underpowered to examine this subgroup. The study by Kuttab et al (2) presents compelling evidence supporting compliance with guideline recommended fluid resuscitation goals; however, little is known regarding the consequences of high-volume fluid resuscitation in septic patients with HF.

HF syndromes are markedly heterogeneous with multiple phenotypes (e.g., preserved, borderline, and reduced ejection fraction [EF]). Effects of these different HF phenotypes on sepsis management have not been characterized. The current report does not provide information on severity (e.g., New York Heart Association class) or characterization of HF

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(e.g., EF, diastolic vs systolic) (2). Reporting these demographics has not been commonplace in critical care but may be yield insight into specific HF populations.

Ishak Gabra et al (3) demonstrated increased risk of 28-day mortality among septic shock patients with HF reduced EF even after adjusting for severity of illness (OR, 1.88; 95% CI, 0.98–3.63; $p = 0.06$). This finding was not observed in HF patients with preserved EF (EF > 40%) (OR, 1.56; 95% CI, 0.73–3.35; $p = 0.25$). However, Leisman et al (1) demonstrated fluid resuscitation initiated within 30 minutes in patients with HF reduced mortality, mechanical ventilation, and length of stay. Recently, the Restrictive IV Fluid Trial in Severe Sepsis and Septic Shock (RIFTS) pilot study (4) examining restrictive versus usual care of fluid resuscitation in septic shock sparked interest in conservative fluid strategies for sepsis; however, the study observed no difference in initial resuscitation fluids from the time of triage to randomization (~9 hr) in which both groups received approximately 35 mL/kg of fluid. No analyses were performed among patients with HF ($n = 31$). In contrast, a retrospective review showed patients with severe sepsis and EF less than 40% that received at least 3 L of fluid had higher mortality than patients who met the same criteria but had an EF greater than 40%; however, results were not adjusted for severity of illness (5). Unfortunately, these conflicting data do provide limited evidence guiding acute resuscitation due to lack of data described in those initial stages of the encounters.

Consistent with Kuttab et al (2), current evidence does not support withholding guideline recommended fluid resuscitation in septic HF patients, but trials examining acute resuscitation in patients with known EFs stratified by severity (e.g., < 40%, < 30%, < 15%) are pivotal in fully answering the question of fluid resuscitation goals in HF.

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