ICU
MANAGEMENT & PRACTICE

Early IV fluid treatment and sepsis mortality

Intravenous (IV) fluids provided by paramedics were associated with reduced in-hospital mortality for patients with sepsis and hypotension but not for those with a higher initial systolic blood pressure. This is the central finding of a large cohort study (n = 1,871 patients) conducted in Canada and published by JAMA Network.

Early IV fluid resuscitation is recommended for the management of sepsis; however, the optimal strategy (i.e., amount of fluids administered) for providing IV fluids remains controversial. Also, a patient's initial blood pressure is a strong indication for providing IV fluids, and initial blood pressure may also influence whether IV fluids have a beneficial or harmful outcome.

Paramedics have a unique opportunity to identify patients with sepsis earlier and provide treatment at the point of first contact. Previous observational studies have found that initiating IV fluid treatment during transportation may reduce the time to achieving resuscitation goals, and improve mortality for patients with sepsis.

Using a large cohort of patients transported to the hospital by paramedics (from a large emergency medical services system in Alberta, Canada), the current study sought to determine whether a patient's initial blood pressure modifies the association with in-hospital mortality of providing IV fluids to patients with sepsis. In testing the association, multivariable logistic regression and a propensity-matched analysis adjusting for baseline patient characteristics were used to minimise confounding by indication.

A total of 1,871 patients with sepsis were identified (955 women and 916 men; median age, 77 years [interquartile range, 64-85 years]), with an overall in-hospital mortality of 28.2% (n = 528). More than half of patients (54.2%) received IV fluids from paramedics; the median volume provided was 400 mL (interquartile range, 250-500 mL). The association of IV fluids with mortality depended on the patient's initial systolic blood pressure (range, 42-222 mm Hg; $P < .001$ for interaction). For example, in a typical patient with an initial systolic blood pressure of 100 mm Hg, IV fluids were associated with decreased mortality (odds ratio, 0.73; 95% CI, 0.56-0.95), but for a typical patient with the median initial systolic blood pressure of 125 mm Hg, IV fluids were not associated with in-hospital mortality (odds ratio, 1.41; 95% CI, 0.81-2.44).

Similar results were obtained in the propensity-matched analysis. The administration of IV fluids was associated with increased prehospital time compared with patients who did not receive IV fluids (median difference, 3.2 minutes; 95% CI, 1.7-4.7 minutes) but was not associated with time to assessment in the emergency department (median difference, 2.4 minutes; 95% CI, –2.4 to 7.3 minutes).

Based on the results, researchers say clinicians may consider administering IV fluids to patients with sepsis when the initial systolic blood pressure is low (e.g., <100 mm Hg) and a more restrictive approach to fluid resuscitation when systolic blood pressure is high.

The researchers note that, given the observational design of this study, they are unable to determine whether early administration of IV fluids has an independent causal association with mortality in patients with sepsis. They explain: "The association we noted may be a surrogate for the true causal factor, the result of residual confounding in our analysis, or both. For example, it is possible that the association we note is because patients with a low blood pressure who are administered IV fluids are recognised as more critical at ED [emergency department] triage and therefore have a shorter time to receipt of antibiotics in the ED."

Planned clinical trials of liberal versus restrictive IV fluid treatment for patients with sepsis should help determine the independent association with sepsis mortality, the researchers add.

Source: JAMA
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