

Late-Breaking Abstracts

SESSION TITLE: Late-Breaking Abstracts 1

SESSION TYPE: Late-Breaking Abstract Slide

PRESENTED ON: Tuesday, October 31, 2017 at 02:45 PM - 04:15 PM

Balanced Crystalloids vs Saline for Critically Ill Adults

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PURPOSE: Saline is the intravenous fluid most commonly administered to critically ill adults, but may be associated with acute kidney injury and death. The purpose of this study was to determine the effect of balanced crystalloids compared to saline on patient outcomes.

METHODS: In a pragmatic, cluster-randomized, multiple-crossover trial in five intensive care units at a single academic center, we assigned 15802 adults to receive saline (0.9% sodium chloride) or balanced crystalloids (lactated Ringer's solution or Plasmalyte A) for intravenous fluid administration, according to the randomization assignment of the unit to which they were admitted. The primary outcome was Major Adverse Kidney Events within 30 days (MAKE30), the composite of death, new renal replacement therapy, or persistent creatinine elevation $\geq 200\%$ of baseline.

RESULTS: Patients in the balanced crystalloid group received a median of 1470 mL [IQR 100 – 3625 mL] of balanced crystalloid and 0 mL [IQR 0 – 0 mL] of saline ($P < 0.001$), whereas patients in the saline group received a median of 0 mL [IQR 0 – 100 mL] of balanced crystalloid and 1180 mL [IQR 125 – 300 mL] of saline ($P < 0.001$). A total of 1,139 patients (14.3%) in the balanced crystalloid group experienced the primary outcome of MAKE30, compared with 1,211 patients (15.4%) in the saline group (adjusted odds ratio, 0.90; 95% confidence interval, 0.82 to 0.99; $P = 0.04$). A total of 818 patients (10.3%) in the balanced crystalloid group died prior to hospital discharge or 30 days, compared with 875 (11.1%) in the saline group (adjusted odds ratio, 0.90; 95% confidence interval, 0.80 to 1.01; $P = 0.06$).

CONCLUSIONS: Among critically ill adults, use of balanced crystalloids for intravenous fluid administration reduced the composite of death, new renal replacement therapy, and persistent renal dysfunction compared with use of saline. (SMART-MED and SMART-SURG ClinicalTrials.gov numbers, NCT02444988 and NCT02547779.)

CLINICAL IMPLICATIONS: Using balanced crystalloids rather than saline for intravenous fluid administration among critically ill adults can reduce the incidence of death, new renal replacement therapy, or persistent renal dysfunction.

No Product/Research Disclosure Information

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Balanced Crystalloids vs Saline for Noncritically Ill Adults in the Emergency Department

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PURPOSE: The comparative clinical effects of physiologically-balanced crystalloids and saline are uncertain, particularly for non-critically ill patients managed outside an intensive care unit. The purpose of this study was to determine the effect of balanced crystalloids compared to saline administered in the Emergency Department on patient outcomes.

METHODS: We conducted a single-center, pragmatic, cluster-randomized, multiple-crossover trial comparing balanced crystalloids (Lactated Ringer's or Plasma-Lyte A) and saline among adults treated with intravenous fluid in the emergency department and hospitalized outside an intensive care unit. Treatment allocation for fluid type in the emergency department was assigned based on calendar month, with crossover between balanced crystalloids and saline each month during the 16-month trial. Outcomes included hospital-free days (number of days alive and out of the hospital to day 28), and Major Adverse Kidney Events within 30 days (MAKE30), defined as the composite of death, new renal replacement therapy, and persistent creatinine elevation $\geq 200\%$ of baseline.

RESULTS: A total of 13,347 patients were enrolled, with a median fluid volume in the emergency department of 1.1 liters (interquartile range: 1.0 to 2.0 liters) and 88% of patients exclusively receiving the assigned fluid. Compared with saline, treatment with balanced crystalloids resulted in similar hospital free days (median: 25 days vs 25 days; aOR: 0.96, 95% CI: 0.91, 1.02) and lower incidence of MAKE30 (4.7% vs 5.6%, $p=0.02$; aOR: 0.82, 95% CI: 0.70, 0.95).

CONCLUSIONS: Compared with saline, balanced crystalloids resulted in similar hospital-free survival and reduced the composite of death, new renal replacement therapy, and persistent renal dysfunction. These results support the use of balanced crystalloids over saline for intravenous fluid therapy in non-critically ill adults (ClinicalTrials.gov number, NCT02614040).

CLINICAL IMPLICATIONS: Using balanced crystalloids rather than saline for intravenous fluid administration in the Emergency Department can reduce the incidence of death, new renal replacement therapy, or persistent renal dysfunction in patients admitted to the hospital.

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