

The Impact of Fluid Resuscitation with Plasma-Lyte A Versus Lactated Ringers on Acid-base Status in Emergency Department Patients with Acidosis

Background:

Lactated Ringers and Plasma-Lyte A are balanced crystalloid fluids, which are designed to more closely mimic human plasma electrolyte content. Studies have shown these fluids, due to their unique salt content, can prevent worsening and possibly improve acidosis when compared to normal saline. However, these studies have not evaluated the difference in efficacy between these balanced crystalloids. This study will evaluate the impact Plasma-Lyte A or Lactated Ringers have on acidosis when used for fluid resuscitation.

Methods:

This retrospective chart review gathered records from January to June 2019 of patients admitted to Mercy Springfield Emergency Department. Patients that received a Lactated Ringers or Plasma-Lyte A bolus and had a serum pH of less than 7.35 were included. Patients were excluded if they did not have laboratory values required to evaluate the effect of these fluids on serum pH and if they received sodium bicarbonate between the initial pH and the end pH. The primary endpoint was pH change after bolus administration. Statistical analysis was performed using student t-test to determine statistical significance of results.

Results:

Facility reports gathered 51 cases that met criteria. Plasma-Lyte A yielded a mean pH change of 0.09 (N=17). Lactated Ringers yielded a mean pH change of 0.06 (N=36). The difference in pH between groups was neither clinically relevant, nor statistically significant ($p=0.22$). A post-hoc power calculation confirmed that the study did not meet power; it would require 1,130 cases to achieve a 95% power.

Conclusions:

This study did not demonstrate a significant difference between Plasma-Lyte A and Lactated Ringers with regards to improving acidosis. A larger multicenter study, as described by the post-hoc power calculation, will be needed to effectively evaluate any difference between these two solutions.