
PURPOSE:
The purpose of the article was to compare resuscitation with normal saline with Plasma-Lyte A a calcium free balanced crystalloid solution. The researchers hypothesized that Plasma Lyte A would better correct the base deficit 24 hours after injury.

DESIGN:
The study was a randomized, double blind parallel group trial of adult trauma patients who required intubation, surgery or blood transfusion within 60 minutes of arriving at the study center (UC Davis). The primary outcome variable was change in base excess from 0-24 hours, with secondary outcomes of arterial pH, serum electrolytes, fluid balance, resource utilization, and in-hospital mortality, between normal saline and plasma-lyte A groups.

SETTING / SUBJECTS:
The study was conducted at the UC Davis Medical Center, an academic urban tertiary care ED in Sacramento, CA. Study population included patients triaged as severe acute injury (including penetrating trauma to neck, chest, abdomen, pelvis, GCS<9, SBP <90) who required intubation, transfusion, or operative intervention in less than 60 minutes. Exclusion criteria included pediatric patients, pregnancy, transfers, those with anticipated death in less than 48 hours, prisoners, and dialysis patients. Ultimately 65 patients were randomized, 33 to the NaCl group, 32 to the Plasma Lyte A group. Eight in the NaCl group, 10 in the Plasma Lyte group were excluded due to lack of consent or patient refusal of blood draws or treatment.

METHODS:
On arrival patients were randomized to one of the two groups and started on treatment; consent was sought later due to the inherent difficulty of obtaining consent in an emergent situation. An unmarked suitcase of crystalloid solution was provided for each patient. There was no set protocol for fluid administration; patients were resuscitated at the discretion of attendings based on blood pressures, CVP, resolution of acidosis, and urine output “per standard practice.” Blood draws were conducted every 6 hours for 4 days for evaluation of electrolytes, creatinine, and base deficit. Clinical outcomes such as
operative interventions, ventilator free days, open abdomen days, organ failure and mortality were evaluated at 30 days.

DATA ANALYSIS:
Mean change in base deficit at 24 hours was compared with students t-test, secondary outcomes with t-test or Mann-Whitney U test. Confounding variables were controlled mainly by randomization of the study subjects.

RESULTS:
Base deficit corrected by 6 hours in the Plasma Lyte group and remained at 24 hours in the NaCl group. Arterial pH also corrected by 6 hours in the Plasma Lyte group, and was also elevated at 24 in the NaCl group. The NaCl group required more magnesium repletion. There was no difference in potassium, calcium or phosphorous between the two groups in the first 24 hours. There were no significant differences between the groups with respect to clinical outcomes listed above. Limitations included sample size—this was a study primarily powered to detect base deficit correction, not clinical outcome differences. In the prehospital setting, many of the patients received fluids from a group they were not randomized to, most of this being NaCl in the Plasma Lyte group. The amount of prehospital fluids was relatively small. Finally, there was no protocolized resuscitation, so variations in individual practice may account for part of the difference in correction of base deficit.

IMPLICATIONS FOR PRACTICE:
The study provides compelling evidence that the use of Plasma Lyte may correct base deficit more quickly; whether this is beneficial or improved clinical outcomes is unclear. At this time there is not sufficiently compelling evidence to incorporate it into practice. The increased cost of plasmalyte compared to normal saline would likely be negligible.