
528 Evaluation of phosphate replacement practices in burn patients

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Introduction: Burn injury causes acute shifts in phosphorus leading to hypophosphatemia and negative sequelae, such as motor neuropathy, muscle weakness, cardiac failure, and respiratory failure. These patients require frequent phosphorus level monitoring and repletion beyond the needs of a general critical care patient. Data suggests patients with normal phosphorus levels have lower incidence of ventilator wean failure and positive clinical outcomes. There is limited data evaluating phosphate replacement practices in burn patients for their intensive care unit (ICU) length of stay while also evaluating those who concomitantly receive continuous renal replacement therapy (CRRT) as it is the primary mode of renal replacement therapy in this population and further depletes phosphorus levels.

Methods: This was a single-center, retrospective, observational study of patients with a burn injury admitted and discharged from a burn intensive care unit (BICU) from January 1, 2016 to June 30, 2020 who received phosphate. Patients less than 18 years of age and those admitted to the BICU for non-burn injuries were excluded. Burn injury type, number of phosphorus doses per day, and phosphorus levels were collected. Normal phosphorus was defined as 2.5-4.9 mg/dL and hypophosphatemia as < 2.5mg/dL. Patient data was evaluated in 24-hour time intervals as defined as midnight to midnight. Phosphorus lab values were included in data analysis if there was corresponding phosphate administration in that 24-hour interval. The primary objective was to assess the temporal dose-response to phosphate replacement in burn patients.

Results: There were 291 patients who met criteria, 116 were selected in chronological order by admission date and were included in data analysis. The mean age was 51.51 years and the mean total body surface area burned was 21.48%. Flame burn accounted for 83.6 % (n=97) of patients and 37.06% (n=43) of patients had concomitant inhalation injury. The mean amount of phosphate given to a patient per day was 28.38 mmol and patients on CRRT received a mean amount of phosphate of 33.34 mmol per day. In response to phosphate administration, the mean change in phosphorus was 0.334 ± 1.08 mg/dL. In patients on CRRT, the mean change in phosphorus was 1.4 ± 1.89 mg/dL. Patients experienced hypophosphatemia 69.63% of the days that they received phosphate repletion and patients on CRRT had hypophosphatemia 87.39% of the days they received phosphate repletion.

Conclusions: Hypophosphatemia is common in the burn injury population and current phosphate replacement practices are insufficient to replete phosphorus in burn injury patients.

529 Outcomes of Total Parenteral Nutrition Use in Burn Patients at a Single Institution

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Introduction: Total parenteral nutrition (TPN) has been widely used among critically ill patients. Some of the controversy surrounding parenteral nutrition stems from its early use in the 1980s, which primarily focused on hyperalimentation. In burn patients, nutritional support is a critical aspect of treatment. The metabolic rate in this patient population can be greater than twice the normal rate, and this hypermetabolic response can last more than a year after the burn injury has occurred. The objective of this study was to evaluate the outcomes of patients in our Burn Center who received TPN during their hospitalization.

Methods: This was a single-site, retrospective review using our institutional Burn Center registry. All adult patients (18 years or older) admitted to our Burn Center between July 1, 2015 and June 30, 2021 who had received TPN during their hospitalization were included in this study. Adult patients who had not received TPN were included for comparative purposes. Variables of interest included demographics, burn mechanism, length of stay (LOS), ICU and ventilator days, and mortality.

Results: There were 20 burn patients who received TPN during their hospitalization. Of those patients who received TPN, 90% were male. The mean age was 45 years, and the mean total body surface area (TBSA) involvement was 32%. The mean resting energy expenditure (REE) was 3,084. On average, the time from day of admission to initiation of TPN was 40 days, and the mean length of TPN administration was 20 days. The overall decrease in patient weight from admission to discharge was 10%. The mean LOS for the TPN group was 118 days. The mean LOS in the ICU was 92 days. The mean ventilator days were 89 days. The overall hospital mortality of patients who received TPN was 20%. When matched with patients who had similar TBSA involvement and who had not received TPN, there was no difference in mortality. However, there was a significant difference in weight loss (4% for non-TPN group), overall LOS (63 days), ICU LOS (29 days), and ventilator days (31 days).

Conclusions: Burn patients who received TPN during their hospitalization had a greater decrease in their overall weight, had a longer hospital and ICU length of stay, and were ventilated longer than those patients who did not receive TPN. These findings are to be expected given that patients who receive TPN tend to be more critically ill, and therefore, require more nutritional support.