516 Phosphorus Requirements in Patients with Severe Thermal Injuries Requiring High-Volume Hemofiltration

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Introduction: Patients with thermal injuries have increased metabolic demands, requiring increased phosphate supplementation. Evidence is scant depicting incidence of hypophosphatemia and repletion requirements in patients with thermal injuries treated with high-volume hemofiltration (HVHF) and a high-flux membrane. The objective of this study was to determine the incidence of hypophosphatemia and characterize repletion requirements in this population.

Methods: This study was a case-control, retrospective chart review. Patients were included if sustained at least 20% total body surface area (TBSA) thermal injuries and required continuous HVHF (prescribed doses ≥ 35 mL/kg/hr). A randomly selected cohort (matched to age, TBSA, and inhalation injury) without acute kidney injury (AKI) was used to compare phosphorus requirements over an initial 14 day period. An a priori sample size was calculated (n = 26) to detect a minimum difference of 0.3 mmol/kg/day. Repeated measures ANOVA was used to compare requirements and concentrations. Demographics, diet, and variables affecting phosphorus concentrations were compared utilizing Fisher's exact, Student's t-test, or Mann-Whitney test depending on type and distribution.

Results: One thousand sixty-six patients were screened. Most were excluded from the HVHF group for TBSA < 20% (58%) or not a burn injury (29%). Sixteen patients were included in each group. The average age was 60.2 ± 15.1 vs 53.3 ± 16.4 (p = 0.22) with median TBSA (p = 0.73) of 30% (23.4, 56.3) vs 29% (26.4, 33.9). All patients in the study group were started on HVHF for AKI, utilizing a 1.6m^2 polyethersulfone membrane (mean delivered prefilter dose of 54.7 ± 1.5 ml/kg/hr), and had statistically higher potassium and phosphorous laboratory values at baseline. Parenteral phosphorus replacements were 2 fold higher in the HVHF group (p = 0.02), but not statistically different after accounting for estimated enteral intake. Despite providing 0.75 mmol/kg/day of phosphorous supplementation (vs 0.66 mmol/kg/day in control, p = 0.45), the HVHF group experienced more days with hypophosphatemia (49.6 ± 12.4 % vs 29.3 ± 16.3 %, p = 0.012). By 72h, every HVHF patient experienced at least one episode of hypophosphatemia. Patients on longer durations of therapy had increasing risk of hypophosphatemia. There was a significant difference in days requiring mechanical ventilation (p < 0.001)

Conclusions: This study demonstrates thermally injured patients receiving HVHF for AKI are at increased risk for hypophosphatemia and require higher phosphate supplementation to maintain lower average serum concentrations, as compared to the controls with similar burns but without acute kidney injury.

517 Outcomes of Patients with Burns Associated with Home Oxygen Therapy: An Institutional Retrospective Review

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Introduction: Home oxygen therapy (HOT) is frequently prescribed for patients with pulmonary dysfunction, which predisposes them to a unique health hazard at home. Prior studies show that HOT burns carry high morbidity and mortality, in large part due to inhalational injury. A significant portion of HOT patients are active smokers, which is the most frequent cause of HOT ignition. We conducted a retrospective review of patients with HOT related burns at our institution to characterize demographics and outcomes in this patient population.

Methods: An IRB-approved single-institution retrospective review was conducted by querying our institutional burn registry for patients diagnosed with head and neck burns between July 2016 and January 2021. Patients with burns due to HOT ignition were included. Patients were separated into three groups: i) discharged from the emergency department (ED), ii) observed for less than 24 hours, and iii) admitted to the hospital. Demographic and clinical outcome data were compared between groups.

Results: We identified 100 patients with HOT burns, who were evaluated from 2016-2021, during which time we treated 3606 patients with burn injuries. Mean age was 66.6 ± 9.3 years with a male to female ratio of 1.3:1 and median TBSA of 1%. In these patients, 97% were on HOT for COPD and smoking caused 87.3% of burns. Thirteen were discharged from the ED, 35 observed for less than 24 hours, and 52 admitted. For admitted patients, 69.2% were admitted to the ICU with a median ICU stay of 1.5 days, 37% required intubation for a median duration of 1 day, and 11.5% required debridement and grafting with an average of 2.6 ± 1.6 procedures. Inhalational injury was found in 26.9% of patients, 3.9% underwent tracheostomy, and 17.3% experienced hospital complications. In-hospital mortality was 9.6% and 7.7% discharged to hospice. Among