719 Effects of Obesity on Outcomes of Adult Burn Patients at a Single Institution

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Introduction: Obesity is a global epidemic that continues to worsen. In 2016, more than 1.9 billion adults were considered overweight worldwide and over 650 million were obese. It is well-known that excess adipose tissue may alter inflammatory and immune mediator regulations, which can lead to challenges in managing resuscitation efforts, respiratory support, and thromboprophylaxis of burn patients. The objective of this study was to evaluate the outcomes of burn patients with obesity at our institution.

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, 2013 and June 30, 2021 who were classified as obese (i.e., body mass index > 30.0) were included in this study. All adult patients who were classified as underweight, normal weight, or overweight were also included for comparative purposes. Variables of interest included demographics, burn mechanism, length of stay (LOS), cost of hospitalization, and mortality.

Results: There were 7,626 patients included in this study, with the largest percentage of patients included in the obese category (38.4%). Among the obese population, most of the patients (53.2%) were classified under 'Obesity Class I' (i.e., body mass index 30.0 – 34.9). The majority of patients in each category were male, except in the 'Obesity Class III' category (i.e., body mass index > 40.0) where 54.8% of the population were female. The mean age of the entire study sample was 44.9 years +/- 17.5 years, while the mean total body surface area (TBSA) involvement was 5.1% +/- 10.0%. The mean LOS of the entire study population was 10.3 days +/- 22.6 days, with patients in the 'Obesity Class III' category having the longest LOS with 14.0 days +/- 36.5 days. The cost of hospitalization was lowest in the overweight group with $82,661, while the highest cost was in the 'Obesity Class III' group with $130,683. The overall hospital mortality for the entire study population was 3.0% with the highest mortality noted in the 'Obesity Class III' group (4.7%).

Conclusions: Obesity affects all aspects of a burn patient's care throughout their hospitalization. In our study, obesity was associated with longer LOS, cost of hospitalization, and mortality; therefore, it is imperative to understand the negative effects that obesity can have on burn patients, not just in terms of their acute management, but also their continued care after hospitalization.

720 Intensive Insulin Therapy in the Burn Intensive Care Unit: A Systematic Review of Literature

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Introduction: The significant burden of burn-related morbidity and mortality is partly due to the complex pathophysiological derangements that occur in the acute post-burn period. Critical care literature has pushed for tighter glycemic control, but these studies often use heterogenous groups of medical and surgical patients. Furthermore, some of these studies present conflicting evidence of whether there is true mortality benefit. Providers must balance the risks associated with hyperglycemia such as infection, inflammation, and pour wound healing against the risks associated with severe hypoglycemia, most notably coma and death. This study aims to review the literature on outcomes in tight glucose control regimens (glucose < 150mg/dL) in the burn ICU population to help guide further research and practice guidelines.

Methods: A systematic review of literature utilizing PubMed was conducted for any article published at any time. Searches used the AND function to identify articles with a burn term (***burn injury*** OR ***burn care*** OR ***burn ICU*** OR ***burn*** OR ***thermal injury*** OR ***burned***) and a glucose control related term (***glucose control*** OR ***glycemic control OR glucose management*** OR ***insulin*** OR ***metformin*** OR ***glipizide***). Inclusion criteria were English studies that describe intensive care unit (ICU) glucose management in adult burn patients. Exclusion criteria were involvement of children, animals, and settings outside of the ICU. Case reports, editorials, and position pieces were also excluded.

Results: The search identified 2,154 articles. Full text review of 61 articles identified 8 that met inclusion criteria. Two randomized control trials, 3 retrospective case-control studies, 2 retrospective cohort studies, and 1 systematic literature review. Only 1 study showed mortality benefit of tighter glucose control (< 150 mg/dL) compared to controls (< 200 mg/dL), while 3 studies showed no difference in mortality between cases and controls. Three studies demonstrated a reduction in infectious complications including sepsis, pneumonia, urinary tract infection, and bacteremia. Nearly all studies (6/8) showed increased rates of hypoglycemia with tight control, but very few instances of adverse sequela following hypoglycemia were noted.

Conclusions: Like the broader critical care population, tighter glucose control may be beneficial to burn patients but with some variability. Balancing the complications of hypoglycemia with hyperglycemia continues to be a challenge with no clear guidelines. Further research in a burn specific population would help create a safe and effective treatment algorithm which could be adapted widely.