Introduction:

Adequate calorie and protein intake is vital to the post-burn recovery process. Indirect calorimetry is considered the gold standard in estimating calorie needs post-burn injury. However, there are no recent randomized, controlled clinical trials to show improved health outcomes when compared to using mathematical formulas to calculate needs. In this study, we evaluated the effectiveness of implementing a practice change of using routine indirect calorimetry for patients who require nutrition support post-burn. Patients fed using routine indirect calorimetry were compared to historical controls fed using mathematical equations, namely Harris Benedict Equation and Curreri Formula. The goal of this study was to identify relationships between method of calorie estimation and health outcomes including weight loss, length of stay, ventilator dependency, wound infection, sepsis, pneumonia, and mortality.

Methods:

Methods: Data was collected prospectively on 12 patients recruited between September 22, 2008 and July 31, 2009 who were fed using indirect calorimetry to estimate caloric needs. Retrospective data was collected on 12 historically matched controls who also received nutrition support post-burn. Matches were based on age, sex, percent total body surface area burn, and burn severity index score. Mathematical equations were used to calculate controls' calorie needs. Statistical analysis was completed using SAS software by performing t-tests with significant values defined as a p-value <0.05.

Results:

Analysis showed no statistically significant differences between study groups. The mean age for the experimental group was 50 years, compared to the control group of 56 years. Groups were similar in burn size, Burn Severity Index Score, number of days to first operative procedure, and Body Mass Index. It is notable that the indirect calorimetry group experienced a higher percentage of significant dry, or edema-free, weight loss (67% versus 33%), with significant weight loss defined by the American Dietetic Association as >5% in 30 days, >7.5% in 90 days, or >10% in 180 days. However, this was not statistically significant when compared to health outcomes. In fact, there were no statistically significant relationships between study groups and health outcomes.

Conclusions:

For this small sample of patients, no significant improvements in health outcomes were noted by including routine indirect calorimetry in nutrition support management. Applicability of Research to Practice: Based on this study, it is reasonable for burn centers to use mathematical calculations to estimate caloric needs post-burn. A larger, multi-center study is warranted before practice guidelines can be implemented.

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