

Average Daily Risk Range as a Measure of Glycemic Risk Is Associated with Mortality in the Intensive Care Unit: A Retrospective Study in a Burn Intensive Care Unit

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Abstract

Background:

Although tight glycemic control has been associated with improved outcomes in the intensive care unit (ICU), glycemic variability may be the influential factor in mortality. The main goal of the study was to relate blood glucose (BG) variability of burn ICU patients to outcomes using a sensitive measure of glycemic variability, the average daily risk range (ADRR).

Method:

Data from patients admitted to a burn ICU were used. Patients were matched by total body surface area (TBSA) and injury severity score (ISS) to test whether increased BG variability measured by ADRR was associated with higher mortality risk and whether we could identify ADRR-based classifications associated with the degree of risk.

Results:

Four ADRR classifications were identified: low risk, medium-low, medium-high, and high. Mortality progressively increased from 25% in the low-risk group to over 60% in the high-risk group ($p < .001$). In a *post hoc* analysis, age also contributed to outcome. Younger (age < 43 years) survivors and nonsurvivors matched by TBSA and ISS had no significant difference in age, mean BG or standard deviation of BG; however, nonsurvivors had higher ADRR ($p < .01$).

Conclusions:

Independent of injury severity, glycemic variability measured by the ADRR was significantly associated with mortality in the ICU. When age was considered, ADRR was the only measure of glycemia significantly associated with mortality in younger patients with burns.

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Abbreviations: (ADRR) average daily risk range, (BG) blood glucose, (FAC) single factor, (GV) glucose variability, (ICU) intensive care unit, (ISS) injury severity score, (POC) point of care, (SD) standard deviation, (TBSA) total body surface area

Keywords: average daily risk range, burn, critical illness, glucose control, glucose variability, glycemic risk

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