

Effect of Diabetes Mellitus on Outcomes of Hyperglycemia in a Mixed Medical Surgical Intensive Care Unit

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Abstract

Background:

Intensive insulin therapy and degree of glycemic control in critically ill patients remains controversial, particularly in patients with diabetes mellitus. We hypothesized that diabetic patients who achieved tight glucose control with continuous insulin therapy would have less morbidity and lower mortality than diabetic patients with uncontrolled blood glucose.

Method:

A retrospective chart review was performed on 395 intensive care unit (ICU) patients that included 235 diabetic patients. All patients received an intravenous insulin protocol targeted to a blood glucose (BG) level of 80–140mg/dl. Outcomes were compared between (a) nondiabetic and diabetic patients, (b) diabetic patients with controlled BG levels (80–140mg/dl) versus uncontrolled levels (>140 mg/dl), and (c) diabetic survivors and nonsurvivors.

Results:

Diabetic patients had a shorter ICU stay compared to nondiabetic patients (10 ± 0.7 vs 13 ± 1.1 , $p = .01$). The mean BG of the diabetic patients was 25% higher on average in the uncontrolled group than in the controlled (166 ± 26 vs 130 ± 9.4 mg/dl, $p < .01$). There was no difference in ICU and hospital length of stay (LOS) between diabetic patients who were well controlled compared to those who were uncontrolled. Diabetic nonsurvivors had a significantly higher incidence of hypoglycemia (BG <60 mg/dl) compared to diabetic survivors.

Conclusion:

The results showed that a diagnosis of diabetes was not an independent predictor of mortality, and that diabetic patients who were uncontrolled did not have worse outcomes. Diabetic nonsurvivors were associated with a greater amount of hypoglycemic episodes, suggesting these patients may benefit from a more lenient blood glucose protocol.

J Diabetes Sci Technol 2011;5(3):731-740

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Abbreviations: (APACHE) Acute Physiology and Chronic Health Evaluation, (BG) blood glucose, (HbA1c) hemoglobin A1c, (ICU) intensive care unit, (IIT) intensive insulin therapy, (NICE-SUGAR) Normoglycemia in Intensive Care Evaluation and Survival Using Glucose Algorithm Regulation, (LOS) length of stay, (OR) odds ratio, (SD) standard deviation, (SEM) standard error of the mean, (TAMC) Tripler Army Medical Center

Keywords: blood glucose, diabetes, hyperglycemia, intensive insulin therapy

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