

Retrospective Outcomes of Glucose Control in Critically Ill Children

Sarah B. Kandil, M.D.,¹ Debra Spear, R.N., C.C.R.N.,² Neal J. Thomas, M.D., M.Sc.,²
Stuart A. Weinzimer, M.D.,³ and Edward Vincent S. Faustino, M.D.¹

Abstract

Background:

Hyperglycemia is a significant problem for critically ill children. Treatment for hyperglycemia remains controversial. This study explores the effect of controlling blood glucose (BG) in hyperglycemic critically ill children.

Methods:

A retrospective cohort of nondiabetic critically ill children (defined as requiring mechanical ventilation and/or vasopressors) with BG persistently ≥ 150 mg/dl and treated with insulin (treatment group) were compared with a historical cohort of similar children who did not receive interventions to control hyperglycemia (baseline group).

Results:

There were 130 children in the treatment group and 137 children in the baseline group. Mean BG in the treatment group was 140 ± 24 mg/dl compared with 179 ± 47 mg/dl in the baseline group ($p < .001$). After adjusting for patient characteristics, cointerventions, and glucose metrics, patients in the treatment group had 2.5 fewer intensive care unit (ICU)-free days (i.e., number of days alive and discharged from ICU within 28 days after inclusion) than the baseline group ($p = .023$). Glucose control was not independently associated with duration of ICU stay, ventilator-free days, vasopressor-free days, or mortality.

Conclusions:

Blood glucose control appears associated with worse outcomes in critically ill children. Our data combined with conflicting results in adults leads us to strongly advocate for the conduct of randomized trials on glucose control in critically ill children.

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Author Affiliations: ¹Department of Pediatrics, Section of Pediatric Critical Care Medicine, Yale University School of Medicine, New Haven, Connecticut; ²Department of Pediatrics, Division of Pediatric Critical Care Medicine, Pennsylvania State University College of Medicine, Hershey, Pennsylvania; and ³Department of Pediatrics, Section of Endocrinology, Yale University School of Medicine, New Haven, Connecticut

Abbreviations: (BG) blood glucose, (CI) confidence interval, (GVI) glucose variability index, (ICU) intensive care unit, (ICUFD), intensive care unit-free days, (PIM2) Pediatric Index of Mortality, (PSHCH) Penn State Hershey Children's Hospital, (VFD) ventilator-free days, (VFPD) vasopressor-free days, (YNHCH) Yale New Haven Children's Hospital

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Corresponding Author: Sarah Kandil, M.D., 333 Cedar St., P.O. Box 208064, New Haven, CT 06520-8064; email address sarah.kandil@yale.edu