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Title: Association between dysglycemia and mortality in children receiving parenteral nutrition in pediatric intensive care unit

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Keywords:

Background: One of the most important complications of parenteral nutrition is hyperglycemia.

Objectives: The aim of this study was to assess the effect of parenteral nutrition dysglycemia on clinical outcomes among critically ill children in pediatric intensive care unit (PICU).

Methods: Charts of 201 critically ill children admitted to PICU of Dr. Sheikh pediatric hospital, during 2012-2015 were reviewed retrospectively. Patients who were below age of six and had received at least 60% of total energy from parenteral nutrition (PN) for a minimum of five days in PICU, were included. The exclusion criteria were diagnosis of diabetes mellitus, primary hypoglycemia, inborn metabolic disorders and dialyses. Blood sugar (BS)≥150 mg/dl was defined as hyperglycemia and BS≤60 mg/dl as hypoglycemia. Based on blood glucose, patients were divided into four groups: 1) "Only hyperglycemia": having at least one hyperglycemia episode. 2) "Only hypoglycemia group": having at least one hypoglycemia episode. 3) "Glucose variability": having both hypoglycemia and hyperglycemia episodes. 4) "Normoglycemia": all glucose measurements were in normal range.

Results: Hyperglycemia and hypoglycemia occurred in 52.8% and 24.9% of all children, respectively. Glucose variability occurred in 13.9% of all children. Multiple logistic regression analysis showed that glucose variability (OR=3.1; 95% CV, 1.13-8.43) and hyperglycemia (OR=2.14; 95% CV, 1.1-4.57) were associated with mortality independently. In "only hypoglycemia" group (n=22) there were only three deaths. There were no significant differences in the quantities of macronutrients prescribed via PN among the four groups.

Conclusion: Hyperglycemia and glucose variability are strong predictors of mortality in pediatrics receiving parenteral nutrition.