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SYMPOSIUM

Hypoglycemia in Critically Ill Children

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Abstract

Background:

The practice of glycemic control with intravenous insulin in critically ill patients has brought clinical focus on understanding the effects of hypoglycemia, especially in children. Very little is published on the impact of hypoglycemia in this population. We aimed to review the existing literature on hypoglycemia in critically ill neonates and children.

Methods:

We performed a systematic review of the literature up to August 2011 using PubMed, Ovid MEDLINE and ISI Web of Science using the search terms "hypoglycemia or hypoglyc*" and "critical care or intensive care or critical illness". Articles were limited to "all child (0–18 years old)" and "English".

Results:

A total of 513 articles were identified and 132 were included for review. Hypoglycemia is a significant concern among pediatric and neonatal intensivists. Its definition is complicated by the use of a biochemical measure (i.e., blood glucose) for a pathophysiologic problem (i.e., neuroglycopenia). Based on associated outcomes, we suggest defining hypoglycemia as <40–45 mg/dl in neonates and <60–65 mg/dl in children. Below the suggested threshold values, hypoglycemia is associated with worse neurological outcomes, increased intensive care unit stay, and increased mortality. Disruptions in carbohydrate metabolism increase the risk of hypoglycemia in critically ill children. Prevention of hypoglycemia, especially in the setting of intravenous insulin use, will be best accomplished by the combination of accurate measuring techniques, frequent or continuous glucose monitoring, and computerized insulin titration protocols.

Conclusion:

Studies on hypoglycemia in critically ill children have focused on spontaneous hypoglycemia. With the current practice of maintaining blood glucose within a narrow range with intravenous insulin, the risk factors and outcomes associated with insulin-induced hypoglycemia should be rigorously studied to prevent hypoglycemia and potentially improve outcomes of critically ill children.

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Abbreviations: (BG) blood glucose, (CGM) continuous glucose monitoring, (ICU) intensive care unit, (POC) point of care

Keywords: blood glucose, blood glucose meter, epidemiology, intensive care, outcome, risk factors

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