Day 1 Blood Glucose and Outcome in Critically Ill Children

We analyzed the association between the day 1 glucose values in 209 children admitted to the PICU and the outcome (mortality). 58 (27.7%) children had hyperglycemia while 18 (8.6%) children had hypoglycemia, on day 1 after admission. Hypoglycemia was associated with higher mortality. This is contrary to the prevalent view supporting the association of hyperglycemia with poor outcome in the critically ill children.

Key words: Blood glucose, Child, Critically ill, Outcome.

Hyperglycemia during critical illness is a fairly common observation; the prevalence ranging from 15% to 86%(1-4). Studies have suggested that hyperglycemia in critically ill children is associated with increased mortality and length of stay(1-4). Some studies have documented hypoglycemia in approximately 10% children(3,4). We undertook a retrospective analysis of data of children admitted to our PICU to evaluate association between abnormalities in blood glucose in first 24 hrs of admission with mortality. Hyperglycemia was defined as blood glucose >126 mg/dL while hypoglycemia was defined as blood glucose <60 mg/dL(1).

Data for 209 (134 boys) children aged more than 1 month age were analyzed. 48.8% of our patients were underweight (weight for age ≤2 SD) and 46% had wasting (weight for height ≤2 SD). In 37.2%, the primary indication of admission was severe sepsis/ septic shock; respiratory distress requiring ventilation accounted for the second largest category (25.6%). 70 children died. 58 (27.7%) children had hyperglycemia, while 18 (8.6%) children had hypoglycemia on Day 1 of admission. ***Table* I** shows the characteristics of the 3 groups based on the blood glucose values on day 1. This suggests that hypoglycemia is an important determinant of mortality in critically ill children. On controlling for the severity of illness using PRISM or PIM2, the association was no longer significant (P=0.68 and P=0.23, respectively).

Our observations suggest an association of hypoglycemia with mortality while there was no such association between hyperglycemia and mortality (P=0.13), which is at variance with most published pediatric studies. Our results are similar to those reported by Klein, *et al*.(5). They observed that controlling for disease severity, hyperglycemia

TABLE I CHARACTERISTICS OF STUDY SUBJECTS

	Hypoglycemia (n = 18)	Normoglycemia (n = 133)	Hyperglycemia (n = 58)	P value
Boys	11	83	40	0.66
Age (months), median (95% CI)	14 (4, 36)	18 (11, 27.9)	24 (14, 46.7)	0.74
Infection at admission	13 (72.2%)	97 (72.9%)	42 (72.4%)	0.99
PRISM, median (95% CI)	25.5 (17.8, 40.9)	14 (12.7, 15)	19 (16, 22)	0.34
Probability of death using PIM2 score, median (95% CI)	32.2% (8, 78.4)	8% (7, 9.4%)	13% (8, 26.6)	0.89
PICU stay (days), median (95% CI)	2 (1, 11)	4 (3, 5)	3 (3, 5)	0.32
Survival	6 (33.3%)	97 (72.9%)	36 (62.1%)	0.003

within 24 hours of PICU admission was not independently associated with increased mechanical ventilation time, length of stay, or mortality(5), though they used a cut off of 200 mg/dL for defining hyperglycemia. Our study patients differ from those in other studies in that we did not have post-surgical patients, while in others they constituted a major proportion. Moreover, a considerable number of children had associated malnutrition. The findings reported here should serve as a caution to the prevalent view supporting the association of hyperglycemia with poor outcome in the PICU.

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Intravenous Immune Globulin for Severe Acute Myocarditis in Children

We evaluated high-dose (2g/kg) intravenous immunoglobulin (IVIG) for severe acute myocarditis in 13 children and compared them for survival with 12 children with myocarditis treated with only conventional therapy. Baseline characteristics were similar between the two groups. Both groups had poor left ventricular ejection fraction (LVEF) on admission. *The mortality rate was 8% in the IVIG treated children as compared to 46% in controls (P=0.04).* Our study supports the use of IVIG in severe acute myocarditis in children.

Key Words: *Child, Immunoglobulin, Left ventricular ejection fraction, Myocarditis*.

We conducted this study to assess the effectiveness of intravenous immune globulin (IVIG) in children with acute severe myocarditis. For this, we studied case-records of all infants admitted with clinical diagnosis of acute myocarditis in our PICU between 2004 to 2007. The diagnosis of acute myocarditis was established clinically on the basis of the history combined with supporting physical examination, relevant investigation and evidence of decreased left ventricular function on echocardiography(1). Children with pre-existing structural heart defect, cardiomyopathy, coronary anomaly, sepsis, or Kawasaki's disease were exclu-ded. Endomyocardial biopsy was not done. Patients were divided into two groups: *Group I* – who received aggressive supportive care and high-dose IVIG (*n*=13) (2 g/kg over 16-24 h on day of admi-ssion) and *Group II* – who received only supportive care and no IVIG(*n*=12). The study was approved by the institutional ethical review committee.

Baseline characteristics of the two groups are compared in ***Table* I.** All of them have antecedent illness (either gastrointestinal or respiratory; mean 2 days), tachypnea and tachycardia for age, hepato-megaly, gallop murmur, pulmonary edema and severe metabolic acidosis. Cardiac troponin (cTnI) was done in Group I only and was markedly elevated (mean 2ng/mL) (normal value <1). All of them received mechanical ventilation for cardiores-piratory support. No adverse effect was observed