

Value of Postoperative Hyperglycemia in Prediction of Low Cardiac Output State after Open Cardiac Surgery in Children

*Peiravian F., Azadvar A.R., Amirghofran A.A.
Islamic Azad University, Kazeroon Branch, Shiraz, Iran*

Background: Hyperglycemia is common in critically ill children including those who had repair of different types of congenital heart defects (CHD). Value of hyperglycemia in prediction of outcome in these patients is controversial.

Methods: During February 2009- January 2010, 78 consecutive children underwent repair of CHD using cardiopulmonary bypass. Blood sugar levels were checked every 6 hours for the first 48 hours after ICU entry and values above 150 mg/dl considered hyperglycemia. Low cardiac output state (LCOS) defined as need for any inotropes more than 10 mcg/kg/min of dopamine for maintaining hemodynamic stability. Then correlation of postoperative hyperglycemia with LCOS and death in these patients studied.

Results: Median age was 15.5 months (7 days-17 years) and median weight 8.8 kg (3- 66 kg). 24 patients (30.8%) developed LCOS and 4 (5.1%) died. Mean BS in 1st and 2nd postoperative days were 161.98 and 119.95 mg% respectively. In the first 24 hours, 44 patients (56.4%) and in the second day 6 (7.7%) developed hyperglycemia. There was no significant correlation between postoperative hyperglycemia and sex, age, weight, type of CHD, RACHS complexity score and duration of mechanical ventilation. Hyperglycemia in day 1 was correlated with number of inotropes ($p=0.005$) and in day 2 with bypass time ($p=0.004$). In the first postoperative day, 40.9% of the patients with hyperglycemia developed LCOS compared with 17.6% in those without hyperglycemia ($p=0.027$) [OR: 3.23, 95% CI: 1.1-9.3]. Hyperglycemia in second day was not accompanied with risk of LCOS ($p=0.069$), but it had a significant correlation with risk of death, 33.3% vs. 2.8% in those without hyperglycemia ($p=0.020$) [OR: 17.5, 95% CI: 1.9-158.5]. Mixing types of CHD ($p=0.007$) and pump time ($p=0.001$) were independent risk factors for LCOS and death. ROC curve analysis showed that $BS > 134.8$ mg/dl in the first postoperative day and bypass time > 68.5 min were cut off points for development of LCOS and death.

Conclusion: In this study hyperglycemia in the first postoperative day was common and a predictor of LCOS and in the second day, although not common, it was a predictor of death after open cardiac surgery in children.