Association of Postoperative Hyperglycemia with Mediastinitis following Pediatric Cardiac Surgery

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Introduction: Mediastinitis is a life-threatening complication that occurs following 1.4% of pediatric cardiac surgical operations (1). Perioperative hyperglycemia is associated with increased morbidity, including infection, in pediatric and adult cardiac surgical patients (2,3). We hypothesized that immediate and early postoperative blood glucose levels would be higher in patients who later developed mediastinitis.

Methods: We examined the medical records of all infants and children diagnosed with postoperative mediastinitis (n=23) from July, 2001 to December, 2005. Data recorded included postoperative blood glucose levels, age, diagnosis, operation, surgical complexity score (4), duration of operation and CPB, delayed sternal closure, perioperative use of steroids and TPN, and duration of postoperative inotropic and ventilatory support. Records of patients without mediastinitis (control group, n=32) matched for age, complexity score, and month of operation were also reviewed. Data were analyzed with t-tests and chi-square tests. Variables with $P < 0.29$ on univariate tests and the presence of hyperglycemia were entered into a multivariate logistic regression model.

Results: Initial postoperative blood glucose levels were elevated but similar in both mediastinitis (175 ± 76 mg/dL) and control (163 ± 97) groups. Persistent hyperglycemia (peak blood glucose level >130 mg/dL) during the first 48 h post-op was significantly associated with the development of mediastinitis.

Multivariate Predictors of Mediastinitis	Odds Ratio (95% CI)	*P* value
Initial post-op glucose > 150 mg/dL	0.7 (0.3-1.5)	0.39
48 h peak glucose > 130 mg/dL	2.4 (1.1-5.5)	0.02
Pre- or intra-op steroids	0.6 (0.3-1.2)	0.14
Pre-op TPN	0.4 (0.2-1.0)	0.04
Post-op TPN	3.3 (1.5-8.7)	0.003
Duration post-op inotropic support	1.0 (0.8-1.1)	0.57

Discussion: Our data support the hypothesis that postoperative hyperglycemia is a risk factor for the development of mediastinitis in infants and children following cardiac surgery. Since the use of insulin to maintain tight perioperative glucose control has been shown to reduce morbidity, including mediastinitis, in adult cardiac patients (3,5), we believe that prospective trials of perioperative glucose control are warranted in pediatric cardiac surgical patients.

References: (1) Long CB et al. Pediatr Infect Dis J 2005;24:315.
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