



E739

JACC March 27, 2012

Volume 59, Issue 13



Congenital Cardiology Solutions

VITAMIN D STATUS IN NEONATES UNDERGOING CARDIAC OPERATIONS: RELATIONSHIP TO CARDIOPULMONARY BYPASS AND OUTCOMES

ACC Oral Contributions

McCormick Place South, S105a

Saturday, March 24, 2012, 10:45 a.m.-11:00 a.m.

Session Title: From Targeting Errors to UNOS: How Quality and Databases Can Impact Clinical Care

Abstract Category: 27. Congenital Cardiology Solutions: Pediatric

Presentation Number: 901-4

Authors: *Eric Matthew Graham, Sarah N. Taylor, Sinai Zybelski, Bethany Wolf, Scott Bradley, Bruce W. Hollis, Francis X. McGowan, Jr, Andrew Atz, Medical University of South Carolina, Charleston, SC, USA*

Background: Emerging evidence suggests that altered vitamin D metabolism has a role in multiple disease processes including ischemia-reperfusion and inflammation. Vitamin D status and its association with outcomes have been unexplored in children with congenital heart disease or cardiac surgery and cardiopulmonary bypass (CPB). The objective of this study is to test two hypotheses: 1) Neonates with congenital heart disease have a high incidence of vitamin D deficiency that differs by race; 2) Postoperative outcomes are negatively associated with 25-hydroxyvitamin D [25(OH)D] levels.

Methods: A secondary analysis of a prospective randomized controlled trial in 70 neonates undergoing cardiac surgery involving CPB was performed. 25(OH)D levels were collected at 3 time points: in the operating room prior to skin incision (baseline), at the cessation of CPB and 24 hours post-operatively. Associations between these levels and clinical outcomes were explored. Vitamin D deficiency was defined as a 25(OH)D level <20 ng/ml.

Results: Mean (standard deviation) levels of 25(OH)D were 14.4 ± 5.8 , 17.0 ± 4.3 and 14.1 ± 4.8 ng/ml at the 3 time points respectively. Vitamin D deficiency was present in 84% (59/70) of these neonates at baseline; concentrations in African-Americans ($n = 20$) were significantly lower than Caucasian/other ($n = 50$) (10.2 ± 4.2 ng/ml vs. 16.0 ± 5.6 ng/ml, $p < 0.0001$). The 24 hour postoperative 25(OH)D level correlated with a reduced postoperative inotropic requirement ($r = -0.316$, $p = 0.008$).

Conclusion: The unique findings of this study are 3-fold. First, vitamin D deficiency is prevalent in neonates with congenital cardiac defects, regardless of race. Second, 25(OH)D levels are not altered by CPB. Third, higher 24 hour postoperative 25(OH)D levels are associated with a reduction in inotropic requirement in neonates undergoing cardiac operations with CPB. These findings provide support that vitamin D may play a role in myocardial injury and postoperative recovery. The role of vitamin D in postoperative pediatric cardiac operations warrants further investigation, and supplementation of mothers and/or newborn infants with congenital heart disease may be in order.