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OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Published online December 27, 2010  
PEDIATRICS (doi:10.1542/peds.2010-0442)

## ARTICLES

### Cord-Blood 25-Hydroxyvitamin D Levels and Risk of Respiratory Infection, Wheezing, and Asthma

Carlos A. Camargo, Jr, MD, DrPH<sup>a,b</sup>, Tristram Ingham, MBChB<sup>c</sup>,  
Kristin Wickens, PhD<sup>c</sup>, Ravi Thadhani, MD, MPH<sup>a</sup>,  
Karen M. Silvers, PhD<sup>d</sup>, Michael J. Epton, PhD, FRACP<sup>d</sup>,  
G. Ian Town, DM<sup>e</sup>, Philip K. Pattemore, MD, FRACP<sup>d</sup>,  
Janice A. Espinola, MPH<sup>b</sup>, Julian Crane, FRACP<sup>c</sup>,  
the New Zealand Asthma and Allergy Cohort Study Group

<sup>a</sup>Center for D-receptor Activation Research and

<sup>b</sup>Department of Emergency Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts;

<sup>c</sup>Wellington Asthma Research Group, Department of Medicine, Wellington School of Medicine and Health Sciences, University of Otago, Wellington, New Zealand;

<sup>d</sup>Canterbury Respiratory Research Group, Department of Paediatrics, Christchurch School of Medicine and Health Sciences, University of Otago, Christchurch, New Zealand; and

<sup>e</sup>University of Canterbury, Christchurch, New Zealand

**OBJECTIVE** Higher maternal intake of vitamin D during pregnancy is associated with a lower risk of wheezing in offspring. The relationship between cord-blood levels of 25-hydroxyvitamin D (25[OH]D) and childhood wheezing is unknown. We hypothesized that cord-blood levels would be inversely associated with risk of respiratory infection, wheezing, and asthma.

**PATIENTS AND METHODS** Cord blood from 922 newborns was tested for 25(OH)D. Parents were asked if their child had a history of respiratory infection at 3 months of age or a history of wheezing at 15 months of age and then annually thereafter. Incident asthma was defined as doctor-diagnosed asthma by the time the child was 5 years old and reported inhaler use or wheezing since the age of 4 years.

**RESULTS** The median cord-blood level of 25(OH)D was 44 nmol/L (interquartile range: 29–78). Follow-up was 89% at the age of 5 years. Adjusting for the season of birth, 25(OH)D had an inverse association with risk of respiratory infection by 3

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months of age (odds ratio: 1.00 [reference] for  $\geq 75$  nmol/L, 1.39 for 25–74 nmol/L, and 2.16 [95% confidence interval: 1.35–3.46] for  $< 25$  nmol/L). Likewise, cord-blood 25(OH)D levels were inversely associated with risk of wheezing by 15 months, 3 years, and 5 years of age (all  $P < .05$ ). Additional adjustment for more than 12 potential confounders did not materially change these results. In contrast, we found no association between 25(OH)D levels and incident asthma by the age of 5 years.

**CONCLUSIONS** Cord-blood levels of 25(OH)D had inverse associations with risk of respiratory infection and childhood wheezing but no association with incident asthma.

**Key Words:** vitamin D • 25-hydroxyvitamin D • cord blood • respiratory infection • wheezing • asthma • New Zealand

**Abbreviations:** 25(OH)D-25 = hydroxyvitamin D • IQR = interquartile range • OR = odds ratio • CI = confidence interval

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Accepted Sep 15, 2010.

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