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ARTICLES

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

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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 ≥ 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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