

# Abstract

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## Serum vitamin D levels and markers of severity of childhood asthma in Costa Rica.

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**RATIONALE:** Maternal vitamin D intake during pregnancy has been inversely associated with asthma symptoms in early childhood. However, no study has examined the relationship between measured vitamin D levels and markers of asthma severity in childhood.

**OBJECTIVES:** To determine the relationship between measured vitamin D levels and both markers of asthma severity and allergy in childhood. **Methods:** We examined the relation between 25-hydroxyvitamin D levels (the major circulating form of vitamin D) and markers of allergy and asthma severity in a cross-sectional study of 616 Costa Rican children between the ages of 6 and 14 years. Linear, logistic, and negative binomial regressions were used for the univariate and multivariate analyses.

**MEASUREMENTS AND MAIN RESULTS:** Of the 616 children with asthma, 175 (28%) had insufficient levels of vitamin D (<30 ng/ml). In multivariate linear regression models, vitamin D levels were significantly and inversely associated with total IgE and eosinophil count. In multivariate logistic regression models, a log(10) unit increase in vitamin D levels was associated with reduced odds of any hospitalization in the previous year (odds ratio [OR], 0.05; 95% confidence interval [CI], 0.004-0.71; P = 0.03), any use of antiinflammatory medications in the previous year (OR, 0.18; 95% CI, 0.05-0.67; P = 0.01), and increased airway responsiveness (a < or =8.58-mumol provocative dose of methacholine producing a 20% fall in baseline FEV(1) [OR, 0.15; 95% CI, 0.024-0.97; P = 0.05]).

**CONCLUSIONS:** Our results suggest that vitamin D insufficiency is relatively frequent in an equatorial population of children with asthma. In these children, lower vitamin D levels are associated with increased markers of allergy and asthma severity.

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