

Abstract

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Association between serum 25-hydroxyvitamin D level and upper respiratory tract infection in the Third National Health and Nutrition Examination Survey.

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BACKGROUND: Recent studies suggest a role for vitamin D in innate immunity, including the prevention of respiratory tract infections (RTIs). We hypothesize that serum 25-hydroxyvitamin D (25[OH]D) levels are inversely associated with self-reported recent upper RTI (URTI).

METHODS: We performed a secondary analysis of the Third National Health and Nutrition Examination Survey, a probability survey of the US population conducted between 1988 and 1994. We examined the association between 25(OH)D level and recent URTI in 18 883 participants 12 years and older. The analysis adjusted for demographics and clinical factors (season, body mass index, smoking history, asthma, and chronic obstructive pulmonary disease).

RESULTS: The median serum 25(OH)D level was 29 ng/mL (to convert to nanomoles per liter, multiply by 2.496) (interquartile range, 21-37 ng/mL), and 19% (95% confidence interval [CI], 18%-20%) of participants reported a recent URTI. Recent URTI was reported by 24% of participants with 25(OH)D levels less than 10 ng/mL, by 20% with levels of 10 to less than 30 ng/mL, and by 17% with levels of 30 ng/mL or more ($P < .001$). Even after adjusting for demographic and clinical characteristics, lower 25(OH)D levels were independently associated with recent URTI (compared with 25[OH]D levels of $> \text{ or } = 30$ ng/mL: odds ratio [OR], 1.36; 95% CI, 1.01-1.84 for < 10 ng/mL and 1.24; 1.07-1.43 for 10 to < 30 ng/mL). The association between 25(OH)D level and URTI seemed to be stronger in individuals with asthma and chronic obstructive pulmonary disease (OR, 5.67 and 2.26, respectively).

CONCLUSIONS: Serum 25(OH)D levels are inversely associated with recent URTI. This association may be stronger in those with respiratory tract diseases. Randomized controlled trials are warranted to explore the effects of vitamin D supplementation on RTI.

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