Prenatal, perinatal, and childhood vitamin D exposure and their association with childhood allergic rhinitis and allergic sensitization


Background
The role of early-life vitamin D in childhood allergy is controversial.

Objective
We sought to assess vitamin D exposure in early life by multiple modalities and ascertain its association with childhood allergic rhinitis and allergic sensitization.

Methods
One thousand two hundred forty-eight mother-child pairs from a US prebirth cohort unselected for any disease were studied. Vitamin D exposure was assessed by measures of maternal intake during the first and second trimesters of pregnancy and serum 25-hydroxyvitamin D (25(OH)D) levels in mothers during pregnancy, cord blood, and children at school age (median age, 7.7 years; interquartile range, 1.0 years). Tests for associations between vitamin D exposure with ever allergic rhinitis, serum total IgE level, and allergen sensitization at school age were conducted.

Results
The correlations between maternal intake of vitamin D during pregnancy and serum 25(OH)D levels in pregnant mothers, cord blood, and children at school age were weak to moderate (r = -0.03 to 0.53). Each 100 IU/d of food-based vitamin D intake during the first and second trimesters (equivalent to the amount of vitamin D in an 8-ounce serving of milk) was associated with 21% and 20% reduced odds of ever allergic rhinitis at school age (odds ratios of 0.79 [95% CI, 0.67-0.92] and 0.80 [95% CI, 0.68-0.93]), respectively. There were no associations between maternal supplemental vitamin D intake or serum 25(OH)D levels at any time point with ever allergic rhinitis. There were no associations between any vitamin D exposure and serum total IgE level or allergen sensitization at school age.

Conclusions
Inclusion of foods containing vitamin D in maternal diets during pregnancy may have beneficial effects on childhood allergic rhinitis.

Key words:
Allergic rhinitis, vitamin D, atopy, prenatal, perinatal, childhood, sensitization, food, supplement, allergy

Abbreviations used:
FFQ (Food frequency questionnaire), 25(OH)D (25-Hydroxyvitamin D), OR (Odds ratio)
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