

Vitamin D supplementation during pregnancy, risk of asthma, wheezing in offspring

26 January 2016



Two randomized trials in the January 26 issue of *JAMA* examine if vitamin D supplementation during pregnancy would reduce the risk of asthma or persistent wheezing in offspring.

Asthma often begins in early childhood and is the most common chronic childhood disorder. The incidence has increased during the last half-century in westernized societies. Vitamin D deficiency has also become a common health problem in westernized societies, possibly caused by a more sedentary indoor lifestyle and decreased intake of [vitamin D](#) containing foods. Vitamin D possesses a range of immune regulatory properties, and it has been speculated that vitamin D deficiency during pregnancy may affect fetal immune programming and contribute to the development of asthma.

In one study, Hans Bisgaard, M.D., D.M.Sc., of the University of Copenhagen, Denmark and colleagues randomly assigned 623 women daily vitamin D3 (2,400 IU/d; n = 315) or matching placebo tablets (n = 308) from pregnancy week 24 to 1 week postpartum. All women received 400 IU/d of vitamin D3 daily as part of usual pregnancy care. Follow-up of the children (n = 581) was completed when the youngest child reached age 3

years in March 2014.

Of these children, persistent wheeze was diagnosed during the first 3 years of life in 47 children (16 percent) in the vitamin D3 group and 57 children (20 percent) in the control group. Vitamin D3 supplementation was not associated with the risk of persistent wheeze. The authors note that a clinically important protective effect cannot be excluded, and that analyses showed a significant reduction in number of episodes of troublesome lung symptoms. However, the development of asthma, upper and lower respiratory tract infections, allergic sensitization, and eczema was unaffected by the vitamin D3 supplementation.

"Effective preventive strategies to alleviate the large burden of childhood wheezing and related disorders represent a major unmet clinical need. This randomized clinical trial of vitamin D3 supplementation during pregnancy did not show a statistically significant effect on the primary end point of persistent wheeze, although a clinically important protective effect cannot be excluded, and a protective effect is suggested by the observed effect on airway immunology and symptomatic episodes. Therefore, further studies with a larger sample size, higher dose, and potentially earlier intervention during pregnancy and postnatal supplementation should be performed to establish the potential benefits of vitamin D3 supplementation to [pregnant women](#) to reduce occurrence of wheezy disorders in the offspring," the researchers write.

In another study, Augusto A. Litonjua, M.D., M.P.H., of Brigham and Women's Hospital, Boston, and colleagues randomly assigned 881 pregnant women at 10 to 18 weeks' gestation and at high risk of having children with asthma to receive daily

4,000 IU vitamin D plus a prenatal vitamin containing 400 IU vitamin D (n = 440), or a placebo plus a prenatal vitamin containing 400 IU vitamin D (n = 436). The researchers conducted the study to determine whether prenatal vitamin D (cholecalciferol) supplementation can prevent asthma or recurrent wheeze in early childhood.

Eight hundred ten infants were born during the study period, and 806 were included in the analyses for the 3-year outcomes. Two hundred eighteen children developed asthma or recurrent wheeze: 98 of 405 (24 percent) in the 4,400-IU group vs 120 of 401 (30 percent) in the 400-IU group. The absolute reduction (6 percent) was not statistically significant; the authors note that the study may have been underpowered.

"In addition, most of the secondary outcomes were not statistically significantly different between groups, and these analyses should be considered exploratory given the null primary outcome and the absence of adjustment for multiple comparisons. Therefore, whether supplementation of pregnant women with vitamin D will reduce [asthma](#) and recurrent wheeze in their offspring at age 3 years remains unclear," the authors write.

"Larger studies and longer follow-up of the children in this study will be needed to answer the question. If additional studies identify a significant effect, given the high prevalence of low vitamin D levels in pregnant women, the effect of this inexpensive intervention on child health could be substantial."

More information: *JAMA*, [DOI: 10.1001/jama.2015.18318](#)

JAMA, [DOI: 10.1001/jama.2015.18589](#)

Provided by The JAMA Network Journals

APA citation: Vitamin D supplementation during pregnancy, risk of asthma, wheezing in offspring (2016, January 26) retrieved 4 August 2022 from <https://medicalxpress.com/news/2016-01-vitamin-d-supplementation-pregnancy-asthma.html>

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