Vitamin D in Pregnancy and Attention Deficit Hyperactivity Disorder-like Symptoms in Childhood.


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Abstract
BACKGROUND: Vitamin D status during prenatal brain development may influence risk of attention deficit and hyperactivity disorder (ADHD) symptoms in childhood. However, there are no prospective studies addressing this hypothesis. We aimed to examine whether maternal vitamin D status in pregnancy is associated with risk of ADHD-like symptoms in offspring.

METHODS: We conducted a prospective study analyzing data from 1,650 mother-child pairs from five birth cohorts embedded in the INMA Project (Spain, 1997-2008). Maternal vitamin D status in pregnancy was estimated by measuring plasma concentration of 25-hydroxyvitamin D3 [25(OH)D3] at 13 weeks of gestation. Children were assessed by teachers for ADHD-like symptoms at ages 4-5 years using the Diagnostic and Statistical Manual of Mental Disorders ADHD form list.

RESULTS: After adjustment, the number of total ADHD-like symptoms in children decreased by 11% per 10 ng/ml increment of maternal 25(OH)D3 concentration (incidence rate ratio [IRR] = 0.89; 95% confidence interval [CI] = 0.80, 0.98). Similarly, the number of symptoms in the ADHD subscales decreased in relation to higher maternal 25(OH)D3 concentration (IRR per 10 ng/ml increment = 0.89; 95% CI = 0.79, 0.99 for the inattention scale; and IRR = 0.88; 95% CI = 0.78, 0.99 for the hyperactivity-impulsivity scale). Using diagnostic criteria, we found an association of increasing maternal 25(OH)D3 with a lower risk of ADHD DSM-IV (relative risk ratio per 10 ng/ml increment = 0.87; 95% CI = 0.72, 1.06) and ICD-10 hyperkinetic disorder (relative risk ratio = 0.72; 95% CI = 0.49, 1.04) in children.

CONCLUSION: Higher maternal circulating levels of 25(OH)D3 in pregnancy are associated with lower risk of developing ADHD-like symptoms in childhood.