Low Vitamin D Levels in Kids Tied to Asthma Exacerbations

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PHILADELPHIA — Children with asthma and on treatment with inhaled corticosteroids who had insufficient blood levels of vitamin D had an increased risk of asthma exacerbations during 4 years of follow-up in a study with 305 children. The results are only suggestive, because the study wasn’t designed to assess the impact of vitamin D levels on asthma, but they warrant further study into a possible role that vitamin D might play in asthma management.

The study included 305 children with asthma enrolled in the inhaled-budesonide group of the Childhood Asthma Management Program. It was designed to assess the safety and efficacy of inhaled corticosteroids in children with asthma. The primary outcome was the incidence of severe asthma exacerbations, defined as emergency department visits or hospitalization for asthma exacerbations. In this post hoc analysis, Dr. Litonjua, a pulmonologist at the Children’s Hospital of Philadelphia and Women’s Hospital in Boston, and his associates measured blood levels of serum 25-hydroxyvitamin D (25(OH)D) level, the primary circulating biomarker of vitamin D status, in blood specimens collected from patients 2 weeks before their randomization in the trial. The post hoc analysis did not receive any commercial funding.

Patients in the inhaled budesonide group were dichotomized by their blood 25(OH)D level. Those with a level of 30 ng/mL or less were categorized as having an insufficient level, those with greater than 30 ng/mL were considered to have sufficient vitamin D. Sufficient levels existed in 70% of the 305 patients, and insufficient levels were in 30%; the overall average level of 25(OH)D was about 40 ng/dL. The average age of all children in the inhaled budesonide subgroup was 9 years. About 59% of the children were boys, and 41% were girls.

During follow-up, severe asthma exacerbations occurred in 24% of the children with insufficient vitamin D and in 18% of the children with sufficient vitamin D. In several analytic models that adjusted for potential confounding differences at baseline, the increased rate of exacerbations was significantly linked with vitamin D insufficiency. Adjustments included age, height, gender, pulmonary function, race, ethnicity, seasonality, and history of exacerbations in the year prior to the study.

In these adjusted models, children with insufficient vitamin D were about 70% more likely than those with sufficient vitamin D to have exacerbations. However, in a model that included all of these adjustments plus study center, the increased risk for exacerbations was no longer statistically significant, although it was 60% higher in the insufficient vitamin D group. There are several possible biologic and genetic logic links between vitamin D and asthma severity. Vitamin D acts on bronchial smooth muscle cells and may play a role in asthma outcomes. Patients in the inhaled budesonide group who were 10 years or older had significantly lower mean waist circumference than those with the lowest vitamin D levels in the intervention group.

The researchers disclosed no potential conflicts of interest.