Study finds limited benefit for vitamin D in asthma treatment

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Mario Castro, M.D., listens to the lungs of a patient with asthma. Castro led a clinical trial investigating the effects of vitamin D supplements on asthma control. Adding vitamin D to asthma treatment to improve breathing only appears to benefit patients who achieve sufficient levels of the supplement in the blood. Overall, the ability to control asthma did not differ between a study group that received vitamin D supplements and a group that received placebo, according to new research at Washington University School of Medicine in St. Louis. Credit: Robert Boston

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appears to benefit patients who achieve sufficient levels of the supplement in the blood. Overall, the ability to control asthma did not differ between a study group that received vitamin D supplements and a group that received placebo, according to new research at Washington University School of Medicine in St. Louis.

"Previous studies suggested that if you have asthma and low levels of vitamin D in the blood, you have worse lung function, more asthma attacks and more emergency room visits than asthma patients with higher vitamin D levels," said Mario Castro, MD, the Alan A. and Edith L. Wolff Professor of Pulmonary and Critical Care Medicine. "This is the first randomized controlled trial to investigate whether taking vitamin D supplements can improve asthma control."

The study appears online May 18 in *JAMA*.

Low levels of vitamin D are thought to play a role in many medical problems, from asthma to osteoporosis to diabetes. In this study, the investigators studied 408 adult patients at nine major U.S. medical centers. All patients had a diagnosis of mild to moderate asthma, and all had what is considered deficient blood levels of vitamin D, with an average of 18 nanograms of vitamin D per milliliter of blood. Measures below 30 are considered abnormal. All patients took an inhaled steroid daily to control their asthma, and all had rescue inhalers in the event of an asthma attack.

The patients were randomly assigned to one of two groups. The treatment group received a loading dose of 100,000 international units of vitamin D3 followed by daily doses of 4,000 units, and the placebo group received identical looking but inactive capsules.

The investigators found no differences between the two groups in all major measures of asthma control. The groups showed no significant

differences in the number of treatment failures requiring patients to take more medication, no difference in the number of asthma attacks and no difference in their need for emergency care. Patients taking vitamin D did not report improved quality of life, based on questionnaires.

One way the groups differed, however, was in how successfully they were able to reduce their daily dosages of inhaled steroids. After the first 12 weeks of the study, if the patient's asthma was well-controlled, the investigators cut in half the daily dose of inhaled steroid, reducing it from 320 micrograms per day to 160. Then, after eight more weeks, if the disease remained controlled, they cut the dose in half again. While both groups were able to taper off their doses of inhaled steroid, the vitamin D group was able to reduce its medication more. By the end of the 28-week study, the vitamin D group was taking an average of 111 micrograms per day, and the placebo group was taking an average of 126.

"The difference was small—15 micrograms of steroid per day—but statistically significant," said Castro, who treats patients at Barnes-Jewish Hospital. "Over the long term, even that small amount may have an important impact on reducing side effects of inhaled steroids. Although inhaled steroids work very well in controlling asthma, patients don't like them because they cause weight gain and increase the risk of diabetes and high blood pressure. Anything we can do to reduce the amount they need is important."

The investigators also noted that despite taking large doses of vitamin D, not all patients in the treatment group achieved what are considered sufficient blood levels of the vitamin. After taking the supplements, 18 percent of the treatment group still had blood levels of vitamin D below 30. The reason that some patients did not appear to respond to the vitamin D supplements is unclear. Though the investigators noted that these patients were more likely to be overweight or obese.

When they looked only at the 82 percent of patients who received vitamin D supplements and showed an increase in their blood vitamin D levels above the critical threshold, Castro said they saw some intriguing results.

Compared with placebo, the patients in the treatment group that achieved vitamin D sufficiency in the blood (with an average of 42 nanograms of vitamin D per milliliter) did show improved asthma control. They had 40 percent fewer treatment failures that required more medication and half the number of asthma attacks.

"We're encouraged by this result, but we have to be careful," Castro said. "Our study was designed to look at the entire group that received vitamin D supplements, not just those who achieved higher levels of vitamin D in the blood. We need more studies looking at this question. But I am paying attention to vitamin D levels in my patients.

"We don't know the long-term effects of supplementing vitamin D," he said. "In our study it appears safe. Patients reported no side effects, and it is inexpensive. If I have a patient with a history of multiple asthma attacks, I'll consider looking at vitamin D levels, and if they're low, giving a supplement. But you have to monitor the blood levels to see if it's having an effect."

More information: Castro M, King TS, et al. for the National Heart, Lung and Blood Institute's AsthmaNet. Effect of vitamin D3 supplementation on asthma treatment failures in adults with symptomatic asthma and lower vitamin D levels: The VIDA randomized clinical trial. *JAMA*. Online May 18, 2014. doi:10.1001/jama.2014.5052

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