

Low vitamin D levels associated with scarring lung disease

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Reviewing medical information gathered on more than 6,000 adults over a 10-year period, Johns Hopkins researchers have found that lower than normal blood levels of vitamin D were linked to increased risk of early

signs of interstitial lung disease (ILD).

Interstitial [lung disease](#) is a relatively rare group of disorders characterized by lung scarring and inflammation that may lead to progressive, disabling and irreversible lung damage. An estimated 200,000 cases a year are diagnosed in the United States, most of them caused by environmental toxins such as asbestos or coal dust, but it can be caused by autoimmune disorders, infections, medication side effects or, sometimes, from unknown causes. Once diagnosed with the disease, most people don't live longer than five years. In a series of studies, the researchers sought to learn about new, and potentially treatable, factors related to early signs of the disease seen by CT scans—imaging abnormalities that may be present long before symptoms develop—which may help guide future preventive strategies.

Results of the most recent data analysis, published in the *Journal of Nutrition* on June 19, suggest that low [vitamin D](#) might be one factor involved in developing interstitial lung disease. Although the researchers caution their results can't prove a cause and effect, their data support the need for future studies to investigate whether treatment of vitamin D deficiency, such as with supplements or sunlight exposure, could potentially prevent or slow the progression of the disorder in those at risk. Currently, there is no proven treatment or cure once interstitial lung disease is established.

"We knew that the activated vitamin D hormone has anti-inflammatory properties and helps regulate the immune system, which goes awry in ILD," says Erin Michos, M.D., M.H.S., associate professor of medicine at the Johns Hopkins University School of Medicine and associate director of preventive cardiology at the Johns Hopkins Ciccarone Center for the Prevention of Cardiovascular Disease. "There was also evidence in the literature that vitamin D plays a role in obstructive lung diseases such as asthma and COPD, and we now found that the association exists

with this scarring form of lung disease too."

To search for that association, Michos and her research team used data from the Multi-Ethnic Study of Atherosclerosis (MESA), which from 2000 to 2002 recruited 6,814 people from Forsyth County, North Carolina; New York City; Baltimore, Maryland; St. Paul, Minnesota; Chicago, Illinois; and Los Angeles, California. The average age of participants was 62, and 53 percent were women. Thirty-eight percent of participants were white, 28 percent were African-American, 22 percent were Hispanic and 12 percent were Chinese.

At an initial clinical visit, staff took blood samples for each participant and measured, among other things, vitamin D levels. Those with vitamin D levels less than 20 nanograms per milliliter—about 30 percent of participants—were considered vitamin D deficient (2,051 people). Those with vitamin D levels of 20-30 nanograms per milliliter were considered to have "intermediate," although not optimal, levels of the nutrient, while those with 30 nanograms per milliliter or more were considered to have met recommended levels.

All participants underwent heart CT scans at the first visit and some also at later visits, offering incidental and partial views of the lungs.

At 10 years in, 2,668 participants had full lung CT scans evaluated by a radiologist for presence of scar tissue or other abnormalities.

The vitamin D-deficient participants had a larger volume, on average (about 2.7 centimeters cubed), of bright spots in the lung suggestive of damaged lung tissue, compared with those with adequate vitamin D levels. These differences were seen after adjusting for age and lifestyle risk factors of lung disease including current smoking status, pack years of smoking, physical inactivity or obesity.

When looking at the data from the full lung scans, the researchers said those with deficient or intermediate vitamin D levels were also 50 to 60 percent more likely to have abnormalities on their full lung scans suggestive of early signs of interstitial lung disease, compared with those with optimal vitamin D levels.

These associations were still seen after additionally adjusting for other cardiovascular and inflammatory risk factors, such as high blood pressure, high cholesterol, diabetes and levels of high-sensitivity C-reactive protein (another inflammatory marker).

"Our study suggests that adequate levels of vitamin D may be important for lung health. We might now consider adding vitamin D deficiency to the list of factors involved in disease processes, along with the known ILD risk factors such as environmental toxins and smoking," says Michos. "However, more research is needed to determine whether optimizing blood vitamin D levels can prevent or slow progression of this lung disease."

People can boost their vitamin D levels by spending 15 minutes a day in summer sunlight or through a diet that includes fatty fish and fortified dairy products. Supplements may be considered for some people with significant deficiency.

According to the 2013 Global Burden of Disease study, about 595,000 people worldwide develop [interstitial lung disease](#) each year, and about 491,000 die each year from it.

Provided by Johns Hopkins University School of Medicine

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