

Vitamin D Levels Predict Depression

Liam Davenport | March 25, 2015

Low serum levels of vitamin D are associated with clinically significant symptoms of depression in otherwise healthy individuals, new research shows.

Making a series of assessments of healthy women during a 1-month period, investigators found that more than one third of participants had depressive symptoms, that almost half had vitamin D insufficiency, and that depressive symptoms were predicted by vitamin D levels.

"Vitamin D deficiency and insufficiency occur at high rates in healthy young women, and lower vitamin D3 levels are related to clinically significant depressive symptoms," say the researchers, led by David Kerr, PhD, School of Psychological Science, College of Liberal Arts, Oregon State University, Corvallis.

Noting that vitamin D supplementation is a low-cost, simple, and low-risk intervention, they add: "Given the lifespan health risks associated with insufficiency, supplementation is warranted whether or not the modest role of vitamin D in depression observed here generalizes more broadly."

The study was published online March 6 in *Psychiatry Research*.

Predictive

Explaining the background, Dr Kerr said that it is popularly believed that vitamin D levels may contribute to depression.

"I think people understandably think that, because they've heard that maybe depression could change with the seasons," he told *Medscape Medical News*.

"They've also heard that vitamin D levels can change with the seasons, since we make vitamin D through our skin when it's exposed to sunlight."

Although previous research has not shown a conclusive link between vitamin D and depression, Dr Kerr noted that many of these studies focused on special medical populations, such as older individuals and those with obesity.

For the current study, the investigators examined 185 female undergraduates living in the Pacific Northwest of the United States, administering the Center for Epidemiologic Studies Depression (CES-D) scale at baseline and then every week for 4 weeks.

In addition, serum vitamin D3 and C levels were measured at baseline and at the end of the study period.

Between 34% and 41% of participants reported clinically significant depressive symptoms, defined as a CES-D score of ≥ 16 , during the study period. Vitamin D3 insufficiency (< 30 ng/ml) was recorded in 42% and 46% of participants at the beginning and end of the study, respectively.

After taking into account season, body mass index, race/ethnicity, diet, exercise, and time outside, the researchers found that lower vitamin D3 levels across the study period predicted clinically significant depressive symptoms ($P < .05$). The only other factor to predict depressive symptoms was use of antidepressants.

Unknown Factor at Play?

Commenting on the findings for *Medscape Medical News*, E. Sherwood Brown, MD, PhD, professor of psychiatry and director of the Psychoneuroendocrine Research Program at the University of Texas Southwestern Medical Center, Dallas, said the study highlights the importance of assessing vitamin D levels in individuals at risk for depression.

He also noted that the findings "probably strengthen the argument about the direction of the relationship."

For a causal relationship to be established, it would need to be shown that vitamin D supplementation was able to have a therapeutic or preventive effect on depression.

So far, results of studies that looked at causality have been mixed, and Dr Kerr pointed out that, again, the available studies have focused on special populations.

Both Dr Kerr and Dr Brown agreed that at this stage, further research is required before it can be recommended that individuals at risk for depression or those already suffering from symptoms take vitamin D supplements.

"I think one challenge with using it as a treatment is that, if you start someone on vitamin D, it takes quite a while to see much of a change in their blood vitamin D levels. It's certainly not going to be a rapid treatment," Dr Brown added.

It is also possible that the association between vitamin D levels and depression may be underpinned by another, as yet unknown, factor.

"There's always a possibility with epidemiological-type studies, or almost any study, that it's really just a consequence of an unknown third factor," Dr Brown pointed out.

Dr Kerr and colleagues did, however, take into account potential confounding factors, an aspect that Dr Brown noted, adding: "I thought this study did a good job trying to control for other possibilities."

Giving an example, Dr Kerr said: "People might say, 'Well, maybe spending less time outside is the common link, because depressed people are maybe more withdrawn and so they don't spend so much time outside, [which] means that they have lower vitamin D levels.'"

"We tried to account for that, but there may be other factors that are common links that are really the better explanation. That's why we would need an experimental design like a clinical trial," he added.

In conclusion, Dr Kerr stressed that the findings do not suggest that vitamin D supplementation should replace other types of treatments, nor that individuals with depression do not need to take antidepressants.

"Vitamin D, if anything, makes a small, preventative contribution, and it's certainly not a substitution for some of the other very well-known, effective treatments for depression. That's important to me as a public health message," he said.

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