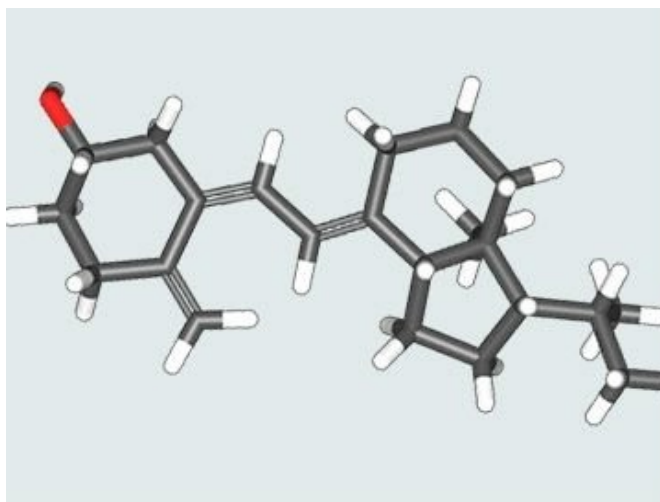


# Study reinforces link between lack of vitamin D and metabolic syndrome

21 March 2018, by Maria Fernanda Ziegler



Over half the study population of postmenopausal women with vitamin D insufficiency or deficiency had metabolic syndrome. Credit: Wikipedia

Results of a study carried out in Brazil show a strong association between vitamin D deficiency and metabolic syndrome in postmenopausal women. Metabolic syndrome (MetS), described as a cluster of conditions that heighten the risk of heart disease, stroke and diabetes, is estimated to affect approximately 50 percent of the female population above the age of 50 in the United States.

Researchers at São Paulo State University's Botucatu Medical School (FMB-UNESP) detected MetS in 57.8 percent of the [women](#) analyzed with vitamin D insufficiency (20-29 nanograms per milliliter of blood) or deficiency (less than 20 ng/ml) and in only 39.8 percent of participants with sufficient vitamin D (30 ng/ml or more).

The results of the study, which was supported by the São Paulo Research Foundation—FAPESP, were published in the journal *Maturitas*.

The study population consisted of 463 women aged between 45 and 75. They were monitored for two years at FMB-UNESP's Climacteric & Menopause Outpatient Clinic. Their last menstruation occurred at least 12 months previously, and they had no existing or pre-existing heart problems.

To indicate whether or not the patient had MetS, the study adopted the typical parameters for MetS diagnosis: waist circumference above 88 cm, high blood pressure (above 130/85 mmHg), high blood sugar (fasting glucose above 100 mg/dL), and abnormal levels of triglycerides (above 150 mg/dL) and cholesterol (HDL below 50 mg/dL). MetS was diagnosed if three or more of these criteria were met.

"We measured the participants' blood vitamin D levels and also analyzed parameters indicating MetS. We found that the lower the level of blood vitamin D, the greater the occurrence of MetS. The results suggest that supplementing and maintaining adequate levels of vitamin D in postmenopausal women can reduce the risk of disease," said Eliana Aguiar Petri Nahas, a professor in FMB-UNESP's Department of Gynecology & Obstetrics and one of the authors of the study.

Previous studies described the existence of several mechanisms that might explain the effect of vitamin D on the components of MetS. According to the article, the most plausible explanation for the association is that vitamin D influences insulin secretion and sensitivity, which play a major role in MetS.

"The vitamin D receptor is expressed in insulin-secreting pancreatic beta cells and in peripheral target tissues such as skeletal muscle and adipose tissue. Vitamin D deficiency can compromise the capacity of beta cells to convert pro-insulin to insulin," wrote the researchers of the FAPESP-funded project.

According to the researchers, however, more studies are needed to confirm the link. "The objective of the study was to evaluate the association between vitamin D deficiency and risk factors for MetS in postmenopausal women," they write in the article.

### Extra-osseous effects

In a previous study, the UNESP researchers also analyzed the association between vitamin D deficiency and breast cancer in postmenopausal women. The survey involved 192 women aged 45-75 with a recent diagnosis of breast cancer and in amenorrhea for over 12 months.

Levels of vitamin D were sufficient in 33.9 percent of the patients and insufficient or deficient in 66.1 percent. A higher proportion of those with vitamin D insufficiency or deficiency had high-grade tumors or metastatic disease.

The researchers on this team are advancing the understanding of the effects of vitamin D on chronic diseases such as obesity, hypertension, diabetes, and consequently MetS, as well as breast cancer.

"The importance of vitamin D to bone mass is well understood, especially in helping absorb calcium into the bones," Nahas said. "Now, we're studying the extra-osseous effects of vitamin D on the cardiovascular system and on the breasts. These are the focus for our current study. In recent years, associations have been proposed between vitamin D deficiency and both inflammation and cardiometabolic diseases. However, more information is needed on the link between vitamin D and cardioinflammatory markers in the general population."

According to Nahas, aging is a key factor in vitamin D deficiency. "Exposure to the sun activates a sort of pre-vitamin D in the adipose tissue under the skin," she explained. "Aging leads not just to loss of muscle mass but also to changes in body composition, and this pre-vitamin D is lost. That's why older people produce less vitamin D even if they get plenty of sunlight."

Forthcoming research planned by the group will

focus on isolated vitamin D supplementation and indicators of cardiovascular disease in postmenopausal women.

"More studies are required in order to make these important associations in terms of the effects of supplementation on cardiometabolic syndrome, the immune and inflammatory mechanisms of cardiovascular disease in postmenopausal women, and their quality of life," Nahas said.

In her view, [postmenopausal women](#) deserve and require more specific care. They should seek medical advice on the need for [vitamin D](#) supplementation. "Hypovitaminosis can have repercussions, be it on [breast cancer](#), vascular disease or [metabolic syndrome](#)," she said.

**More information:** Eneida Boteon Schmitt et al, Vitamin D deficiency is associated with metabolic syndrome in postmenopausal women, *Maturitas* (2017). DOI: [10.1016/j.maturitas.2017.10.011](https://doi.org/10.1016/j.maturitas.2017.10.011)

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