

Vitamin D Status May Impact Breast Cancer Risk, According to Recent Study

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Breast cancer is highly prevalent, with about 1 in 8 women developing the disease in the course of their lifetime. As of March 2017, over 3.1 million women have a history of breast cancer in the US alone.

Breast cancer mortality has been slowly decreasing since 1989. However, a total of 40,610 women are expected to die from the disease this year in the US, making breast cancer the second leading cause of cancer related death among women. Therefore, preventative action is important to protect the lives of women throughout the world.

Researchers theorize vitamin D plays a crucial role in cancer prevention. One of vitamin D's functions in the body is regulating cell differentiation and cell growth. Cancer cells are non-differentiated, enabling them to divide at an uncontrolled rate. Vitamin D can initiate cell apoptosis, or programmed cell death, when cells become dysfunctional. In addition, about 80% of all breast cancers grow in response to the presence of estrogen. Vitamin D down regulates estrogen receptors, providing another plausible mechanism by which vitamin D helps prevent breast cancer tumors from forming.

However, the current observational research on vitamin D and breast cancer risk has yielded conflicting findings. Therefore, researchers recently conducted a large prospective cohort study, hypothesizing vitamin D intake is associated with breast cancer risk.

The researchers assessed the role of vitamin D status in breast cancer development over a period of five years among 50,884 women between the ages of 35 and 74 years old from the Sister Study. Although the participants had no personal history of breast cancer, all had a sister who was diagnosed with the disease. Those who have a sister with breast cancer are twice as likely to develop the disease than those with siblings without breast cancer.

The participants received a phone interview to obtain information regarding their vitamin D intake, sun exposure habits, reproductive, medical and residential histories. Trained medical staff visited the participant's homes to obtain blood samples, body measurements and self completed questionnaires regarding dietary habits. The researchers contacted the participants annually to evaluate any major health changes.

A total of 3,392 participants from the Sister Study were randomly selected to join a substudy to evaluate the participant's vitamin D status. Those who developed invasive breast cancer within 5 years of their initial blood draw were considered cases ($n = 1,616$), while those with no history of breast cancer were identified as controls (1,844). The participants had their vitamin D levels sent to Heartland Assays for analysis (the lab the Vitamin D Council uses for measuring 25(OH)D levels).

Here is what the researchers found:

- At baseline, 54% of participants reported supplementing with vitamin D at least 4 times per week.
- Participants with 25(OH)D levels higher than 38 ng/ml were associated with a 21% reduced risk of breast cancer (HR = 0.79; CI: 0.63, 0.98).
- The participants who reported supplementing with vitamin D at least 4 times per week experienced an 11% decreased risk for developing breast cancer (HR = 0.89; CI: 0.81, 0.99).
- The role of vitamin D status and vitamin D supplementation in breast cancer risk was strongest among postmenopausal women (HR = 0.72; CI: 0.57, 0.93 and HR = 0.83; CI: 0.74, 0.93, respectively)($p = 0.02$).

The researchers concluded,

“In this prospective observational study of vitamin D and breast cancer, high 25(OH)D serum levels were associated with lower risk of developing breast cancer over the ensuing 5 years.”

They continued,

“The association with lower risk was only evident for women with serum levels in the highest quartile (>38.0 ng/mL) and appeared to be strongest in postmenopausal women and obese women. The association remained strong even after excluding the first 2 y of follow-up, suggesting that it is unlikely to be explained by reverse-causal effects of occult tumors on 25(OH)D.”

The researchers addressed the study's limitations. Self reported data on vitamin D intake, sun exposure and time spent outdoors is a notoriously weak predictor of 25(OH)D status due to the many factors that affect vitamin D production. Additionally, the majority of the participants were caucasian, leaving the researchers unable to determine whether these findings would remain consistent across ethnicities. However, the large population size and study duration increase the strength of these findings.

The average adult requires 5,000 IU vitamin D3 per day to reach levels between 40-60 ng/ml. The Vitamin D Council recommends maintaining levels at this range, as this is what our bodies would naturally maintain through safe, sun exposure. Since this dosage is considered completely safe, and research is suggesting vitamin D may significantly reduce the risk of developing cancer, what do you have to lose?

Citation

Sturges, M. & Cannell, JJ. Vitamin D status impacts breast cancer risk, according to recent study. *The Vitamin D Council Blog & Newsletter*, 8/2017.

Source

O'brien, K. et al. Serum Vitamin D and Risk of Breast Cancer within Five Years. *Environmental Health Perspectives*, 2017