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Increased Mortality Rates Associated With Vitamin D Deficiency

Scientists from the German Cancer Research Center and the Epidemiological Cancer Registry of the German state of Saarland have conducted a large study to analyze the link between vitamin D deficiency and mortality. Study participants with low vitamin D levels were more likely to die from respiratory diseases, cardiovascular diseases and cancer. Overall mortality in this group was increased, too. These findings underpin the need to carefully assess the effectiveness of taking vitamin D supplements as a preventive measure.

Vitamin D deficiency has been known for many years to be a risk factor for osteoporosis. Recent studies suggest that vitamin D, due to its hormonal effect, may also influence other chronic diseases such as respiratory diseases, cancer and infections. If this was true, then an inadequate supply of vitamin D should also have an impact on mortality in a population.

Scientists are looking into this question in the ESTHER* study. The German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) conducts the study in collaboration with the Saarland Epidemiological Cancer Registry, Saarland Ministry of Social Affairs, Health, Women and Family. The study includes almost 10,000 participants from the whole of Saarland, a German state. Professor Hermann Brenner from DKFZ is the study director.

Vitamin D levels in the blood of many study participants were particularly low in winter. In January, for example, twenty-four percent of participants had very low vitamin D levels, and 71 percent had low vitamin D levels**. In July, for comparison, the proportion of ESTHER participants with very low and low vitamin D counts was only 6 percent and 41 percent, respectively.

The particularly low vitamin D levels in winter time are explained by the fact that the body produces most of the vitamin D it needs from exposure to UVB radiation. The low amount of UVB light in Germany during the dark winter months is often not enough to stimulate sufficient vitamin D production.

The mortality rate in ESTHER study participants with very low and low vitamin D levels was statistically significantly higher than in participants with higher blood vitamin D counts. Taking account of all confounders, the mortality rate over the eight-year observation period was increased 1.7-fold in participants with very low vitamin D levels and 1.2-fold in participants with low vitamin D levels.

In particular, study participants with very low vitamin D levels had an increased risk of dying from respiratory diseases (2.5-fold increase in mortality risk). They were also more likely to die from cardiovascular diseases (1.4-fold increase) or cancer (1.4-fold increase).

Does that mean that everybody should take vitamin D supplements for prevention? There is controversy among scientists about this question: Randomized controlled studies on the impact of vitamin D supplementation on mortality show that effects are generally rather low. Large studies are currently being conducted on the effectiveness of vitamin D supplements, but they require another couple of years of follow-up. “However, the results of the ESTHER study show that these research efforts may well be worthwhile, because low vitamin D levels are very common in Germany,” says Dr. Ben Schöttker, first author of the article.

Until there are confirmed findings about vitamin D supplementation, the scientist recommends that people should get moderate doses of sunlight during the warm months of the year to make sure they get enough vitamin D and create a deposit for winter time. It is usually not possible to meet one's vitamin D needs through food alone. However, the duration of sun exposure should be limited – depending on skin type – to a level that does not increase the risk for skin cancer. The German Nutrition Society (Deutsche Gesellschaft für Ernährung) recommends that for most people in Germany, depending on their skin type, it should be sufficient to expose face, hands and forearms to sunlight for five to 25 minutes per day during the months of March through October to produce enough vitamin D.

*ESTHER = **E**pidemiologische **S**tudie zu Chancen der Verhütung, Früherkennung und optimierten **Th**erapie chronischer **Er**krankungen in der älteren Bevölkerung (Epidemiological study assessing chances of prevention, early detection and optimized treatment of various chronic diseases among older adults)

**Definition of vitamin D levels:

- very low: <30 nmol/L serum 25 hydroxyvitamin D
- low: <50 nmol/L serum 25 hydroxyvitamin D

Schöttker B, Haug U, Schomburg L, Köhrle L, Perna L, Müller H, Holleczek B, Brenner H.
Strong associations of 25-hydroxyvitamin D levels with all-cause, cardiovascular, cancer and respiratory disease mortality in a large cohort study.
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