

Vitamin D Deficiency Associated with Weakness in Older Patients

WINSTON-SALEM, N.C., April 23 -- Vitamin D deficiency in older patients has been associated with poor performance on simple physical tasks, according to investigators here.

Those 65 and older with low physiologic levels of 25-hydroxyvitamin D did significantly less well on physical performance tests and handgrip strength measures their peers with normal vitamin D levels, reported Denise K. Houston, Ph.D., of Wake Forest, and colleagues, in the April issue of the *Journal of Gerontology: Medical Sciences*.

Physical performance and grip strength were about 5% to 10% lower in men and women with low levels of vitamin D, even after the investigators controlled for factors such as body mass index, physical activity, seasonal variation, cognitive abilities, and anemia.

"There is a growing awareness that the prevalence of low vitamin D levels is common among the elderly," they wrote. "Recent findings showing the importance of vitamin D status on multiple health outcomes underscore the need for more research on the effects of low vitamin D status in elderly populations."

Dr. Houston and Italian colleagues evaluated 976 men and women 65 and older who lived in two towns in the Chianti region of Italy, and who were participants in the prospective, population-based InCHIANTI aging study.

The participants had to a short physical performance battery consisting of walking speed, ability to stand from a chair, and ability to maintain balance in progressively more challenging positions. Each test was scored from 0 to 4, with 4 representing the highest level of performance, and the scores were added. The participants were also tested for handgrip strength with a handheld dynamometer.

The authors also collected serum vitamin D and parathyroid hormone levels from blood samples after an overnight, 12-hour fast, and measured levels of 25-hydroxyvitamin D with an immunoassay. They defined vitamin D deficiency as a 25-hydroxyvitamin D level less than 25.0 nmol/L, and vitamin D insufficiency as less than 50 nmol/L.

The investigators also created logistic regression models controlling for age, study site, education, smoking status, BMI, physical activity, total energy intake, cognition, and seasonal fluctuations in sunlight.

They found that about twice as many women as men met the definition for vitamin D deficiency (28.8% of women, versus and 13.6% of men), and three-fourths of all women and half of all men met the criteria for insufficiency (74.9% and 51%, respectively).

Vitamin D levels overall were significantly associated with physical performances scores in men only (β coefficient 0.38 (standard error 0.18), $P=0.04$), and with handgrip strength in both men and women. The β coefficient for handgrip strength in men was 2.44, SE 0.84, $P=0.004$) and in women was 1.33 (SE 0.53,

$P=0.01$).

Both men and women with vitamin D deficiency had significantly lower physical performance scores than those with 25-hydroxyvitamin D levels of 25 nmol/L or more ($P<0.05$) and those with vitamin D insufficiency had significantly lower handgrip strength than those with vitamin D levels of 50 nmol/L or above ($P=0.01$).

When they looked at parathyroid hormone levels, the authors found significant associations only between the hormone and handgrip strength (β coefficient per unit of the natural logarithm of serum parathyroid hormone -2.50 [SE 0.98] for men, and -1.70 [SE 0.67] for women [$P=0.01$]).

The study was designed to explore associations and not causality, so the authors could not determine whether vitamin D levels were the reason for poor physical performance or a marker for some other cause.

"Although it is biologically plausible that low vitamin D levels may result in low muscle strength and poor physical performance, it is also possible that those with poor physical performance had less exposure to UVB rays resulting in low vitamin D levels," the authors wrote.

According to the National Institutes of Health's Office of Dietary Supplements, men and women from the ages of 50 to 69 should get 400 IU of vitamin D per day, and those 70 and older should get 600 IU per day.

"Higher amounts of vitamin D may be needed for the preservation of muscle strength and physical function as well as other conditions such as cancer prevention," Dr. Houston said. "The current recommendations are based primarily on vitamin D's effects on bone health."

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