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High-Dose Vitamin D Supplement May Reduce Risk of Falling Among Older People

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October 1, 2009 — High-dose vitamin D supplementation may reduce the risk of falling among older people, according to the results of a meta-analysis reported in the October 2 Online First issue of the *BMJ*.

"In several trials of older individuals at risk for vitamin D deficiency, vitamin D supplementation improved strength, function, and balance in a dose-related pattern," write H.A. Bischoff-Ferrari, MD, MPH, from the University of Zurich in Zurich, Switzerland, and colleagues. "Most importantly, these benefits translated into a reduction in falls. Overall, however, results have been mixed for fall prevention with vitamin D; for example, several trials of vitamin D have had non-significant results."

The goal of this meta-analysis was to evaluate the efficacy of supplemental and active forms of vitamin D with or without calcium in preventing falls among older individuals. The reviewers searched for relevant articles in Medline, the Cochrane central register of controlled trials, BIOSIS, and Embase up to August 2008, and they found additional studies from bibliographies and abstracts and by consulting clinical experts. When indicated, the reviewers contacted study authors for additional data.

Inclusion criteria were double-blind, randomized controlled trials enrolling groups of individuals of mean age 65 years or older, with sufficiently specified fall assessment. Participants in included trials were given a defined oral dose of supplemental vitamin D (vitamin D₃ [cholecalciferol] or vitamin D₂ [ergocalciferol]) or an active form of vitamin D (1 α -hydroxyvitamin D₃ [1 α -hydroxycalciferol] or 1,25-dihydroxyvitamin D₃ [1,25-dihydroxycholecalciferol]).

There were 8 randomized controlled trials of supplemental vitamin D that met inclusion criteria, enrolling a total of 2426 participants. The investigators observed heterogeneity among trials for dose of vitamin D (700 - 1000 IU/day vs 200 - 600 IU/day; $P = .02$) and for achieved 25-hydroxyvitamin D₃ concentration (25 [OH]D concentration: < 60 nmol/L vs \geq 60 nmol/L; $P = .005$).

In 7 trials enrolling a total of 1921 subjects, use of high-dose supplemental vitamin D was associated with a 19% reduction in fall risk (pooled relative risk (RR), 0.81; 95% confidence interval [CI], 0.71 - 0.92). Achieved serum 25 (OH)D concentrations of at least 60 nmol/L were associated with a 23% reduction in fall risk (pooled RR, 0.77; 95% CI, 0.65 - 0.90).

In contrast, 2 trials enrolling a total of 505 subjects showed that use of low-dose supplemental vitamin D was not associated with a notable reduction in fall risk (pooled RR, 1.10; 95% CI, 0.89 - 1.35). Also, achieved serum 25 [OH]D concentrations of less than 60 nmol/L appeared to affect fall risk significantly (pooled RR, 1.35; 95% CI, 0.98 - 1.84). In 2 randomized controlled trials ($n = 624$) meeting inclusion criteria, active forms of vitamin D were associated with a 22% reduction in fall risk (pooled RR, 0.78; 95% CI, 0.64 - 0.94).

"Supplemental vitamin D in a dose of 700-1000 IU a day reduced the risk of falling among older individuals by 19% and to a similar degree as active forms of vitamin D," the study authors write. "Doses of supplemental vitamin D of less than 700 IU or serum 25-hydroxyvitamin D concentrations of less than 60 nmol/l may not reduce the risk of falling among older individuals."

Limitations of this study include potential publication bias and larger-than-expected variation between trials. "Doses of 700 IU to 1000 IU supplemental vitamin D a day could reduce falls by 19% or by up to 26% with vitamin D3," the study authors conclude. "This benefit may not depend on additional calcium supplementation, was significant within 2-5 months of treatment, and extended beyond 12 months of treatment....Active forms of vitamin D do not appear to be more effective than 700-1000 IU of supplemental vitamin D for fall prevention in older persons."

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