High Vitamin C Intake May Reduce Hip Fracture Risk

BY JEFF EVANS
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MONTREAL — Consumption of vitamin C at sufficiently high levels is associated with nearly a 50% decrease in the risk of hip and nonvertebral osteoporotic fractures in elderly men and women, according to a 15- to 17-year follow-up of participants in the Framingham Osteoporosis Study.

Previous studies of menopausal and postmenopausal women have shown that dietary intake of vitamin C is associated with increased bone mineral density (BMD), and that a high vitamin C serum level is associated with a decreased prevalence of fracture. Poor dietary intake of vitamin C also has been associated with an increased risk of hip fracture, Marian T. Hannan, D.Sc., said at the annual meeting of the American Society for Bone and Mineral Research.

Vitamin C, an antioxidant, plays an important role in the formation of collagen, which is a major component of connective tissue. Published evidence suggests that oxidative stress may result in increased osteoclast formation, leading to bone resorption, said Dr. Hannan, who presented the study on behalf of Shivani Sahni of Tufts University, Boston. (Ms. Sahni performed the research as a part of her thesis but could not attend the meeting.)

For the study, participants were divided into three groups based on their intake of vitamin C. The relative risk of hip fracture was significantly lower for individuals who had the highest total intake of both dietary and supplemental vitamin C (a median of 305 mg/day) than it was for people with the lowest total intake (median of 97 mg/day). The relative risk was a 44% decrease in relative risk of hip fracture, according to Dr. Hannan of Harvard Medical School’s Institute for Aging Research, Boston.

Those with the highest total intake of vitamin C also had a 36% lower relative risk of vertebral fracture, diabetes, hypertension, metabolic syndrome, smoking, and macrovascular disease. In a multivariate Cox regression analysis that controlled for age and other potential confounders, subclinical hyperthyroidism was independently associated with a 3.4-fold increased risk of all-cause mortality compared with euthyroid status. Subclinical hyperthyroidism conferred a 2.4-fold increased risk.

All-cause and cardiovascular mortality were higher in subjects with more pronounced subclinical thyroid dysfunction than in those with milder abnormalities. For example, the cardiovascular mortality rate was 2.8% in euthyroid subjects, 8.6% in those with a relatively mild subclinical hyperthyroidism as defined by a TSH of 0.1-0.44 mU/L, and more than 27% in participants with a TSH below 0.1 mU/L. But even in individuals with only mildly increased or decreased TSH the increase in mortality was statistically significant.

Subjects with subclinical thyroid dysfunction tended to be older than euthyroid individuals. However, the populations had similar baseline rates of osteoporosis, diabetes, hypertension, metabolic syndrome, smoking, and macrovascular disease.

These data highlight the need to identify and treat individuals with subclinical thyroid dysfunction.

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ROME — A 1.7% reduction in hemoglobin A₁c at 2 years was associated with a 1.9-fold decrease in 54-week phase III trial. This reduction, seen after 104 weeks of total follow-up, was significantly better than the reductions achieved with either drug alone or placebo, and was associated with no more adverse events than metformin monotherapy.

Dr. Debora Williams-Herman of Merck Research Laboratories in Rahway, N.J., presented the data at the annual meeting of the European Association for the Study of Diabetes.

The extension trial involved 454 patients who had already completed 1 year of treatment with the dipeptidyl peptidase-4 (DPP-4) inhibitor sitagliptin alone at a dose of 100 mg/day; twice-daily treatment with metformin alone at a dose of 500 mg or 1,000 mg; both drugs in combination with metformin; or placebo alone and metformin. The results of this investigation were published last year and showed that, at 54 weeks’ follow-up, the mean change from baseline in hemoglobin A₁c (HbA₁c) level was –1.8% in patients given the 50-mg sitagliptin/1,000 mg metformin combination (Diabetes Care 2007;30:1979-87).

Now, at 2 years, the results show a similar and sustained reduction in HbA₁c, compared with both baseline values, with a -1.7% mean change in HbA₁c in the 105 patients who were treated with the sitagliptin and higher-dose metformin combination. A mean change of –1.4% in HbA₁c was reported in the 96 patients who were given the sitagliptin plus lower-dose metformin combination, with mean changes in HbA₁c of –1.3%, –1.1%, and –1.1% in the metformin 1,000 mg/day, metformin 500 mg/day, and sitagliptin 100 mg/day groups, respectively.

Almost two-thirds (60%) of patients given the sitagliptin plus metformin combination achieved an HbA₁c below 7%, compared with 45% for each of the other groups. The percentage of patients with subclinical thyroid dysfunction was not statistically significant. The elevated all-cause mortality in this group was attributed to a combination of cardiovascular, cancer, and infectious disease deaths.

In the subclinically hyperthyroid group, all-cause and cardiovascular mortality rates were significantly increased among both men and women. In those with subclinical hyperthyroidism, however, the elevated mortality risk was present only in men.

The increased mortality associated with subclinical thyroid dysfunction was confined to patients aged older than 60 years. Dr. Orlo H. Clark, an audience member, wondered if the findings could be extrapolated to patients who had surgery for thyroid cancer.

“Are we hurting patients when we purposely suppress their TSH once they’ve had thyroid cancer surgery? Do you think that has an adverse effect on their survival?” asked Dr. Clark, professor and chair of the department of surgery at the University of California, San Francisco, Medical Center at Mount Zion.

Dr. Sagar replied that he believes that’s a reasonable implication, although the study didn’t address that issue.

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