Do Calcium and Vitamin D Help?

BY SHERRY BOSCHERT
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SAN FRANCISCO — Recent data challenge the long-standing assumption that sufficient levels of calcium and vitamin D are fundamental in preventing and treating osteoporotic fracture, Eric S. Orwoll, M.D., said at a meeting on osteoporosis sponsored by the University of California, San Francisco.

Calcium absorption and vitamin D levels decline with age. A number of studies over the years have solidified the idea that calcium and vitamin D supplements are effective and important in preventing osteoporosis and fractures, said Dr. Orwoll, professor of medicine at Oregon Health and Science University, Portland.

Findings from a large, well-designed study stirred up controversy when results indicated there were no differences in the rates of repeat fractures among patients with a previous fracture who took calcium, vitamin D, or calcium and vitamin D.

The investigators randomly assigned 5,292 patients aged 70 and older to one of four groups—800 IU daily oral vitamin D, 1,000 mg calcium, oral vitamin D combined with calcium, or placebo—and followed them for a median of 45 months (Lancet 2005;365:1621-8).

Among the total, 698 (13%) sustained a new low-trauma fracture. Of these, 183 (26%) were hip fractures. Investigators observed no significant differences in the incidence of new, low-trauma fractures between patients who received calcium vs. those who did not (12.6% vs. 13.7%); between those who received vitamin D_3 vs. those who did not (13.3% vs 13.1%) or between patients who received combination treatment and those who received placebo (12.6% vs. 13.4%).

Importantly, by 2 years into the Randomized Evaluation of Calcium or Vitamin D (RECORD) trial, only 55% of patients were still taking the calcium and vitamin D tablets, Dr. Orwoll noted. "This is more a compliance issue than an efficacy trial, but it's in the real world," he said. Analysis of various subgroups could find no effects on fracture rates from the supplements.

The results contradict earlier findings. A 2003 study of 2,686 people aged 65-85 years who were vitamin D deficient found a 22% lower rate of fractures after 5 years in those who took oral vitamin D (100,000 IU every 4 months) vs. those who took placebo. A 2004 metaanalysis of five randomized, controlled trials of vitamin D for people older than 60 years found a 30% lower risk of falls in those taking vitamin D.

Whether supplements reduce fracture risk, and in which patients, remains to be seen, but they are necessary for bone mass and muscle function.

A 2005 metaanalysis of seven randomized trials of vitamin D supplementation with 9,820 participants showed that people taking higher doses (700-800 IU/day) of vitamin D had lower rates of hip fractures or any nonvertebral fractures than participants who took 400 IU/day. Nearly all studies included calcium supplements (JAMA 2005;293:2257-64).

Differences between the RECORD trial and earlier trials may account in part for the conflicting findings, Dr. Orwoll said. In an earlier trial in France, for example, 800 IU/day of vitamin D significantly reduced fracture risk, compared with placebo in frail, elderly patients with a mean age of 85 years; all resided in group housing and had very low baseline levels of calcium and vitamin D (Osteoporosis Int. 2002;13:257-64).

Patients in the RECORD trial were a bit younger (mean age 77 years), had somewhat higher baseline levels of calcium and vitamin D, and were home-dwelling instead of institutionalized. "So calcium and vitamin D might show the most robust effect in the frailest patients," he suggested.

Whether or not calcium and vitamin D supplements reduce fracture risk, and in which patients, remains to be seen, but they are necessary for maintaining bone mass and muscle function, Dr. Orwoll said. Most adults don't get enough calcium and vitamin D, and current recommendations on adequate vitamin D levels are too low, he added.

The Institute of Medicine in 1997 recommended vitamin D doses of 200 IU/day for adults aged 31-50 years, 400 IU/day for ages 51-70, and 600 IU/ day for older people.

A serum level of 30-35 ng/mL of 25-hydroxyvitamin D (25[OH]D) may be ideal for maximizing GI absorption of calcium and avoiding elevated parathyroid levels, Dr. Orwoll noted. A recent poll of six experts suggested that much higher doses of vitamin D supplements are needed to reach those levels. The experts said that 1,000-1,600 IU/day vitamin D would be needed to reach serum levels of 30-32 ng/mL 25(OH)D.

Vitamin D and calcium supplements are inexpensive and safe, so there's little reason not to use them, he said. Recommended daily calcium requirements are scientifically reasonable, even though they're based more on physiologic data than on clinical outcome studies.

Institute of Medicine guidelines in 1997 recommended calcium doses of 1,000 mg/day for adults aged 25-50, 1,200 mg/day for older adults, and 1,000-1,300 mg/day for pregnant or lactating women.

Vitamin D supplementation should be at least 800-1,000 IU/day, Dr. Orwoll said. For pure nutritional inadequacy, it may be appropriate to treat with a loading dose of 50,000 IU per week for 2 months followed by 1,000 IU/day, depending on baseline vitamin D levels. Vitamin D deficiency due to malabsorption or increased catabolism may require doses as high as 100,000 IU/day, he said. ■

BMD Dips, Then Plateaus Following Gastric Bypass

CHICAGO — In one of the first studies to examine the long-term endocrine effects of gastric bypass surgery, it appears that after a loss in the first year post procedure, bone mineral density recovers in succeeding years, researchers reported at the annual meeting of the Society for Surgery of the Alimentary Tract.

Surgeons at Virginia Commonwealth University in Richmond prospectively collected data on 233 patients who were undergoing gastric bypass surgery. Of those, 82% had a Roux-en-Y procedure, 12% laparoscopically. The average age was 40 years, and the average body mass index was 50 kg/m^2, reported Jason Johnson, M.D., a fellow in the division of minimally invasive and advanced laparoscopic surgery at Virginia Commonwealth University, Richmond.

Dr. Johnson and his colleagues obtained preoperative bone mineral density (BMD) scans and found that most patients were normal at baseline, and remained at normal levels, even after surgery. Fifteen patients were osteopenic at baseline. Three developed osteopenia at 1 year post procedure. One patient with preoperative osteopenia actually had an increase in BMD after surgery.

At 1 year, for all patients, total forearm BMD decreased by 0.55%, and radius BMD increased by 1.85%. Total hip and lumbar spine BMD declined by 9.27% and 4.53%, respectively. These seem like fairly large decreases, but none of the patients developed osteoporosis during this period, Dr. Johnson said. The figures suggest a decline in the first year after gastric bypass, but the clinical significance of this is not yet known, he added.

At 2 years, forearm BMD decreased by 3.62%, but radius BMD remained steady. Both total hip and lumbar spine BMD recovered somewhat in the second year, bringing them to almost the same levels as preoperatively.

At 3 and 4 years after surgery, BMD trended up, but there were too few patients at those time points to determine if the increases were statistically significant, Dr. Johnson said.

About 50%-60% of patients had calcium, parathyroid hormone, and vitamin D levels taken before surgery; all had those elements measured annually thereafter.

The mean serum calcium decreased from 9.8 mg/dL at baseline to 9.2 mg/dL in the first year, and to 8.8 mg/dL in the second year.

Although the study backed other reports showing an initial decline in BMD, the clinical significance is not known, Dr. Johnson said. "We have shown it's not an ongoing process," he added.

—Alicia Ault

Most Steroid Users Aren't on Bisphosphonates

BY MICHELE G. SULLIVAN
Mid-Atlantic Bureau

ST. LOUIS — Bisphosphonates remain underutilized in the prevention of glucocorticoid-induced osteoporosis, despite national clinical guidelines that recommend their use in patients on long-term oral steroid therapy, Rosemarie Liu, M.D., said at the annual meeting of the Society of Investigative Dermatology.

"In 2001, the American College of Rheumatology published guidelines recommending that all patients beginning long-term oral steroid therapy of at least 5 mg/day should receive a prescription for a bisphosphonate, if not contraindicated," said Dr. Liu of Eastern Virginia Medical School, Norfolk. "Despite these guidelines, the vast majority of patients in our study did not receive appropriate prophylaxis for glucocorticoid-induced osteoporosis."

Dr. Liu and her colleagues conducted a cross-sectional study of 35 patients referred to the tertiary dermatology clinic at the Hospital of the University of Pennsylvania, Philadelphia, from 1995 to 2004. Of that group, 60% (21) were female and 83% (29) were white. Their mean age was 54 years (29-86). The mean daily dose of prednisone was 53 mg, with a range of 10-150 mg/day. The patients had been on steroids for a mean of 17 months, with the longest duration of use, 102 months.

Twenty-eight (80%) of the patients were taking prednisone for pemphigus vulgaris; other indications were lupus erythematosus (4), dermatomyositis (2), and arthritis with interstitial granulomatous dermatitis (1). The majority of the patients (80%) were not on any bisphosphonates at the time of their referral. The investigators found that the 2001 publication of the ACR Guidelines for Prevention and Treatment of Glucocorticoid-Induced Osteoporosis had no effect on bisphosphonate prescriptions in this group.

"The guidelines were published in July 2001, but we used January 2002 as the cutoff date, because we wanted to give adequate time for them to be incorporated into clinical practice," Dr. Liu said. Among those referred before 2002, 75% were not on bisphosphonates; among these referred after 2002 (1 year after the guidelines were published), 81% were not on bisphosphonates.

Dual energy x-ray absorptiometry scans were available for 18 patients. The mean time on steroids before DXA scan was 13 months. Seven of those patients had a normal scan, eight had evidence of osteopenia, and three had evidence of osteoporosis. One patient had a vertebral fracture within 5 months of beginning prednisone.

"When patients are started on long-term oral steroids, a bisphosphonate should be prescribed unless contraindicated, Dr. Liu said. Also, a baseline DXA scan should be ordered to provide information about baseline bone health, and should be repeated whenever clinically indicated." ■