



Store hours:
Thurs. 9AM - 8PM
Fri. 8AM - 8PM
Sat. 8AM - 6PM



OSTEOPOROSIS:

Visit our internet store at: www.shaffervitamins.com We feature over 700 Brand Names Featuring over 14,000 Products! **SAVE at least 30%-40%** on Every Order! **NO COMPUTER - NO PROBLEM!** Call (484) 695-9496 if you need assistance or if you would like us to place the order for you! We are listed at <http://www.fairgroundfarmersmkt.com> listed under Merchants — Specialty Shops. Check out our in store monthly specials!

PREVENTING AND REVERSING OSTEOPOROSIS

Calcium is important, but it's not the whole story

For years, both the medical profession and the public have focused almost exclusively on calcium as the nutrient for building bones. After all, as the argument goes, bones contain a lot of calcium; so if we just take more calcium, our bones will be stronger. Calcium is just one of the many nutrients involved in the prevention and treatment of osteoporosis. Furthermore, taking calcium supplements alone, particularly in large amounts, may not do much good and, in some cases, could even cause harm. The reality is that bone tissue is complex, dynamic, and alive and, like other tissues in the body, has a wide range of nutritional needs. That diversity of nutrient requirements is best illustrated by two studies, one published in 1981, the other in 1990. In the first study, a nutritional supplement containing calcium plus "all known micronutrients" increased the bone density of healthy women two or three times more effectively than did calcium alone. In the second study, a comprehensive program that included diet, hormones, and a broad spectrum of vitamins and minerals produced an astounding 11 percent increase in the bone mineral content of postmenopausal women in less than one year. Neither calcium



alone, nor calcium plus hormones, has ever come close to producing an improvement that great in so short a period of time.

While calcium deficiency is unquestionably one cause of osteoporosis, and while calcium supplementation has preventive or therapeutic value in certain circumstances, we

cannot just drink more milk or take more calcium supplements and expect our bones to turn out perfectly fine. But at the same time, ingesting an adequate quantity of absorbable calcium is one of the goals of an osteoporosis prevention program. Studies on the relationship between calcium intake and osteoporosis are many and varied, and have produced conflicting and confusing results. The consensus of opinion about calcium has changed several times over the years, from effective, to ineffective, to partially effective.

Studies on osteoporosis

An earlier study, published in 1964, demonstrated that the intestinal absorption of calcium supplements was markedly lower in people with osteoporosis than in healthy people. Increasing the calcium intake of osteoporotic individuals would, in theory,

compensate for this reduced absorption, thereby improving bone mass. It would be a number of years before the technology would be available to measure small changes in bone mass. However, when that technology did become available, the first thing many investigators looked at was calcium.

Calcium and bone mass

In 1977 study, 72 postmenopausal women were given either calcium supplements (800 mg/day), estrogen, or no treatment. Untreated women continued to lose bone, while those given estrogen did not. Bone loss in the calcium treated group was intermediate. In another study several years later, 20 elderly women were given 2.25 ounces of cheese per day and a daily supplement containing 350 mg of calcium, 270 mg of phosphorus, and 399 units of vitamin D. After six months, the average bone density had increased significantly. Eleven women had an increase in bone density, three had no change, and six had decreased bone density at the end of the study. Other reports have also shown that calcium improves bone mass. In one such report, calcium supplements reduced the number of



vertebral crush fractures in women with postmenopausal osteoporosis by about 50 percent. Whereas untreated women were suffering an average of nearly one collapsed vertebra every year, calcium treatment reduced this figure by half. When calcium and estrogen were given together, the incidence of vertebral fractures fell by 82 percent. In a more recent study, 169 women ages 35 to 65, received 1,500 mg/day of calcium or a placebo for four years. The calcium group lost less bone mineral than did the placebo group. The results of calcium supplementation were more pronounced in postmenopausal than in premenopausal women.

Another study of a group of 76 healthy postmenopausal women investigated the relationship between dietary calcium intake and osteoporosis. Bone mineral density of the lumbar spine was measured at the time the dietary survey was taken and was then repeated seven months later. Women whose daily calcium intake was less than 405 mg lost bone at a significantly greater rate than did those whose calcium intake was greater than 777 mg/day.

However, a number of other studies have shown that calcium has little or no value in the prevention or treatment of osteoporosis. In a study by B. Lawrence Riggs, M.D., of the Mayo Clinic, 106 healthy women, ages 23 to 84 years, were observed for periods of 2.6 to 6.6 years. During that time, there was no correlation between dietary calcium intake (which ranged from 260 to 2,035 mg/day) and the rate of bone loss. In another study, women in the early postmenopausal period who received 2,000 mg/day of supplemental calcium had approximately

the same rate of bone loss as those given a placebo. Other research has shown that, in people with osteoporosis, a high calcium intake has no effect either on bone formation or bone resorption.

These conflicting results are consistent with the viewpoint that calcium deficiency is only one of many causes of osteoporosis and that not everyone who has osteoporosis is actually deficient in calcium. In one study, the prevalence of skeletal calcium deficiency was assessed in fifty-six osteoporotic patients, using a combination of three measurements: (1) total mineral content per gram of bone, (2) bone density, and (3) sodium/calcium ratio in bone. The results of these measurements suggested that only 25 percent of the patients had a skeletal calcium deficiency, even though all of them had osteoporosis. Supplementation with calcium and vitamin D for two years corrected the skeletal calcium deficiency in all cases but did not improve bone mass in 75 percent of osteoporotic individuals who had initially normal skeletal calcium levels.

Too much calcium

Although there is no proof that taking these larger doses is harmful, there are some concerns about possible adverse consequences of taking too much calcium. Specifically, taking too much calcium might interfere with the absorption or utilization of other essential nutrients. Studies have shown that calcium interferes

with the absorption of iron. This inhibition is more pronounced with increasing calcium doses, but can occur even at intakes of calcium commonly found in the diet. Oral administration of excess calcium also de-

creased the absorption and tissue levels of zinc in rats. Although short term studies (up to 45 days) in healthy male rats failed to find that 2,000 mg/day of calcium affected zinc balance, it is possible that taking high doses of calcium for years could deplete zinc.

Perhaps the most significant concern about taking too much calcium is that it might lead to magnesium deficiency. Magnesium deficiency appears to be one of the most widespread and most clinically significant nutritional problems in the United States. Taking excessive amounts of calcium might further compromise what is already, for many individuals, a rather precarious situation with respect to magnesium status. The adverse effect of calcium supplementation on magnesium levels has been demonstrated in animal studies. Rats that were fed a diet containing 1.5 percent calcium had lower levels of magnesium in various tissues of their body than rats fed only one third that much calcium.

Magnesium deficiency

Calcium and magnesium have a number of chemical similarities and interact in many important ways in biochemical systems. For example, magnesium has been shown to prevent the formation of calcium oxalate crystals, the most common cause of kidney stones. In fact, in people who suffer from recurrent stone formation, administering 500 mg/day of magnesium reduced the recurrence rate by as much as 90 percent. Magnesium also functions as nature's calcium channel blocker, preventing the transfer of calcium into places within the cell where it could do harm. In animal studies, magnesium deficiency causes calcium deposits in the kidney, a condition known as nephrocalcinosis. There is also evidence that magnesium deficiency promotes athero-



sclerosis (hardening of the arteries), which is characterized by, among other things, calcification of arterial tissue. These studies indicate that magnesium deficiency can cause various abnormalities of calcium metabolism, resulting in the formation of calcium deposits in places where calcium does not belong.

This calcium-magnesium interaction presumably extends to bone tissue as well. Osteoporotic women who were deficient in magnesium had abnormal (and presumably more fragile) calcium crystals in their bones, whereas osteoporotic women with normal magnesium status had normal calcium crystals in bone. This effect of magnesium deficiency on bone could be considered yet another example of abnormal calcification, similar to that induced in the urinary tract, kidney, and aorta by magnesium deficiency.

Why such high doses?

Doctors who recommend 1,500 mg/day of calcium do so because of a study that showed that such a large dose is necessary for elderly women to maintain calcium balance. However, few doctors who prescribe 1,500 mg/day of supplemental calcium have stopped to consider what maintaining calcium balance actually means. In nutritional studies, the term balance refers to the difference between the amount of a nutrient entering the body and the amount leaving. If someone is in positive calcium balance, they are excreting less than they are taking in, and their total body calcium content is increasing. If they are in negative calcium balance, they are excreting more than they are taking in, and their total-body calcium content is declining. For a person in calcium balance (also called zero calcium balance), the intake and output are the same and the total body calcium content remains steady. Doctors assume

that maintaining calcium balance is the same as preventing bone loss. Unfortunately, that assumption may not be correct. In an elderly individual with chronic degenerative diseases, the arteries and joints may be slowly calcifying, and additional calcium deposits may be developing in muscle or other soft tissue. That type of calcium retention is not exactly desirable; on the contrary, it is a manifestation of disease progression. So, if someone is losing a little bit of bone while, at the same time, calcifying their soft tissues, their total body calcium content might remain the same, even though their body is falling apart. There is no way of knowing to what extent this type of scenario actually occurs.

What I am concerned about, however, is that taking excessive amounts of calcium without adequate magnesium could accelerate both osteoporosis and soft tissue calcification. Furthermore, this unhealthy situation might be misinterpreted as desirable, if calcium balance is the sole criterion upon which results are based. It is interesting to note that human autopsy studies have shown a close correlation between osteoporosis and calcification of the abdominal aorta. Since magnesium deficiency can promote both osteoporosis and aortic calcification, it is possible that magnesium is the primary factor and that calcium is secondary.

Balance calcium with magnesium

Therefore, if someone chooses to take large doses of calcium, I strongly urge them to increase their magnesium intake as well. There are many different opinions among nutrition oriented practitioners concerning the proper ratio of calcium to magnesium. The traditional ratio is 2 mg of calcium for every 1 mg of magnesium. Many nutri-

tional supplement programs provide 800 to 1,000 mg of calcium and 400 to 500 mg of magnesium daily. Some doctors, however, are of the opinion that these minerals should be provided in equal amounts. Other practitioners actually recommend a reversal of the ratio: 2 mg of magnesium for every 1 mg of calcium.

Surprisingly, there is virtually no research aimed at determining the optimal calcium/magnesium ratio in the diet. The osteoporosis study by Dr. Abraham, which reported such a dramatic improvement in bone mass, did supply more daily magnesium (600 mg) than calcium (500 mg). In practice, I have seen an occasional patient with premenstrual syndrome or other symptoms who clearly responded better to 800 mg of magnesium and 400 mg of calcium than to the reverse ratio. Perhaps our best bet at present is to follow the lead of those who have reported the best results and keep the calcium level low to moderate, while raising the magnesium intake. We just do not know yet what the best approach is. Additional research in this area is urgently needed. One thing we do know is that taking calcium by itself, particularly large amounts, may not do a whole lot of good, and has the potential to cause harm.

Editor's Note: The above article was excerpted from the book, Preventing and Reversing Osteoporosis by Dr. Alan Gaby.



HEALTH SCENE

Vitamin K and preventing osteoporosis

Vitamin K has long been known as the blood clotting vitamin. However, vitamin K is also important for bone metabolism and preventing osteoporosis.

In his book, *Preventing and Reversing Osteoporosis*, Alan Gaby, M.D., states, "Vitamin K is required for the production of osteocalcin, a protein found in large amounts in bone." Osteocalcin provides structure and order to bone tissue.

According to Dr. Gaby, protein molecules do not attract the necessary calcium ions; however, vitamin K is capable of changing that.

"Vitamin K plays a key role in the formation, remodeling, and repair of bone, by helping to build the protein matrix upon which calcium crystallizes. Without adequate vitamin K, bones would lack structure and order and would, like chalk, be fragile and easily broken, Dr. Gaby stressed.

According to the *Annual Review of Nutrition*, "Several studies have demonstrated that a poor vitamin K status is associated with an increased risk of osteoporotic bone fractures." Vitamin K deficiencies are often found in people who frequently use antibiotics, as they destroy the friendly bacteria in the intestines. These bacteria naturally produce Vitamin K.

Those with gastrointestinal disorders or poor fat absorption also tend to be vitamin K deficient. The body also releases calcium through the urine. Vitamin K reduces that release of calcium, sometimes by as much as 50 percent.

Vitamin K is found in a wide variety of vegetables, especially leafy green vegetables. It can also be found in alfalfa, kelp, yogurt, egg yolks, fish liver oils, and milk.

A very good source of vitamin K is fat-soluble chlorophyll capsules. Vitamin K can also be taken as a supplement with the recommended dosage being 150 to 500 mcg/day. Some multivitamin supplements contain vitamin K in the recommended dosage range. For best absorption, take vitamin K supplements with a meal.