SOUTHWESTERN NEWS

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CALCIUM CITRATE TRUMPS CALCIUM CARBONATE IN OSTEOPOROSIS STUDIES

DALLAS – November 23, 1999 – Three studies from UT Southwestern Medical Center at Dallas researchers show that calcium citrate is better absorbed than calcium carbonate and is effective at preventing osteoporosis in early post-menopausal women.

Osteoporosis – or brittle-bone disease – is a major health threat to 28 million Americans. About 10 million have the disease, and 18 million more are at increased risk due to declining bone density caused by loss of calcium within the bones. Forty percent of women and 13 percent of men will suffer a bone fracture due to osteoporosis in their lifetime.

"It is well-recognized that calcium supplements taken at the proper time can help prevent bone loss in elderly patients," said Dr. Khashayar Sakhaee, chief of mineral metabolism. "We are interested in seeing which formulation is most beneficial in preventing osteoporosis and in maintaining bone density in early post-menopausal women."

Two of the studies compared calcium citrate with calcium carbonate to see which was better absorbed. Sakhaee and colleagues published their analysis of data from 15 previously published randomized trials evaluating bioavailability (the amount of calcium absorbed from a supplement, rather than the amount of calcium a supplement contains) in the November-December issue of the *American Journal of Therapeutics*. The second study, published by Dr. Howard Heller, assistant professor of internal medicine, and collaborators, in the November issue of the *Journal of Clinical Pharmacology* compared the absorption of two over-the-counter calcium supplements – Citracal (calcium citrate) with Os-Cal (calcium carbonate). The researchers used classic pharmacokinetic techniques of measuring peak and cumulative increase in blood calcium concentration over six hours following a single oral dose instead of the indirect method of measuring change in urine calcium excretion.

A third study, published by Sakhaee, former UT Southwestern faculty member Dr. Lisa Ruml and co-workers, also reported in the November-December issue of the *American Journal*

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of Therapeutics, compared the effect of calcium citrate vs. a placebo in preventing bone loss in early post-menopausal women.

All three studies confirmed the benefits of calcium citrate. The conclusion from the 15-trial analysis was that calcium citrate was absorbed 22 percent to 27 percent better than calcium carbonate when taken either on an empty stomach or with meals. Heller's study of commercial calcium preparations concluded that Citracal was more "bioavailable" than Os-Cal; it was absorbed faster and to a greater extent.

"Our results show that even under the most favorable conditions, calcium carbonate is not nearly as well-absorbed as calcium citrate," Heller said. "We were surprised at the magnitude of the difference in absorption rates – with calcium citrate being absorbed two and a half times better than calcium carbonate."

The third study – the first of its kind – showed the benefits of calcium citrate in early post-menopausal women. During the two-year study, 57 women in early menopause (five years into menopause) and six mid-menopausal women (five to10 years into menopause) took either 800 milligrams of calcium citrate or a placebo daily. Those taking calcium citrate averted bone loss by stabilizing the bone density in their spine, in the top part of the thigh bone (a common site of hip fractures) and in the small bone of the forearm. Women taking the placebo had a significant decrease over the two-year period in the densities of the spine and forearm, but showed no change in thigh-bone density.

"This study shows that calcium-citrate treatment may be used alone in the prevention of skeletal bone loss in early post-menopausal women," said Sakhaee. "The long-term effectiveness of calcium citrate is a particularly exciting therapeutic finding."

UT Southwestern mineral metabolism researchers developed Citracal in conjunction with Mission Pharmacal of San Antonio.

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