

SOUTHWESTERN NEWS

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UT Southwestern researchers find calcium intake contributing factor in formation of kidney stones

DALLAS – Dec. 28, 2004 – Individuals with either calcium oxalate or calcium phosphate kidney stones should not take extra calcium on their own as suggested by previous research, but should check with their doctors to determine the dietary guidelines that work best for them, researchers at UT Southwestern Medical Center at Dallas have found.

Articles published by UT Southwestern researchers in the November issue of *Kidney International* and the December issue of the *Journal of Urology* showed that urinary calcium – the amount of calcium in a person’s urine – is an important contributing factor in the formation of both types of kidney stones. Earlier studies had downplayed the significance of calcium when compared to the levels of oxalate in urine, and even encouraged kidney stone patients to increase their dietary intake of calcium.

“We often see patients who tell us they have been advised to take more calcium; however, that could be a dangerous recommendation for some individuals,” said Dr. Margaret Pearle, an author of the first study, professor of urology and internal medicine at UT Southwestern.

“While we want to be cautious in asking anyone to restrict calcium intake because of the risk of bone disease, we also realize that urinary calcium has about the same influence as urinary oxalate in calcium oxalate stone formation, and we may want to recommend calcium restriction in patients who have moderately to severely elevated intestinal calcium absorption and urinary calcium levels,” she said.

The same is true for patients with calcium phosphate stones, said Beverley Adams-Huet, an author of both studies, a faculty associate in internal medicine and a biostatistician in UT Southwestern’s General Clinical Research Center (GCRC). “The second study reaches a similar conclusion, which is that the level of urinary calcium has an important influence in the formation of calcium phosphate stones,” she said. “This offers supportive evidence that people with calcium phosphate stones may need to carefully monitor their calcium dietary intake.”

An estimated 10 percent of Americans will have a kidney stone some time in their lives, with men typically affected more frequently than women.

Kidney stones are solid deposits that form in the kidneys from substances excreted in urine. When waste materials in urine do not dissolve completely, microscopic particles begin to form and over

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time grow into kidney stones. The most common type of kidney stone contains calcium in combination with either oxalate or phosphate, with calcium oxalate stones accounting for about 60 percent and calcium phosphate about 20 percent of kidney stones.

Both studies looked at data from patients in UT Southwestern's kidney stone registry, a computer database of medical information gleaned from more than 2,200 kidney stone patients evaluated at the GCRC during the past 27 years. The first study looked at data from 667 patients with predominantly calcium oxalate stones; the second considered data from 133 patients with predominantly calcium phosphate stones.

Calcium was not regarded as important as oxalate in kidney stone formation in earlier studies because a different "stability constant," or mathematical formula, was used to calculate urinary saturation of calcium oxalate, with results showing that less attention should be focused on calcium. Researchers at UT Southwestern, however, used a newer, lower stability constant, today regarded as the "gold standard" in the industry, yielding data that pointed to calcium's more essential role.

Dr. Charles Y.C. Pak, lead author on both studies and former director of the Charles and Jane Pak Center for Mineral Metabolism and Clinical Research at UT Southwestern, urged patients to seek their physician's advice before deciding whether to limit or increase calcium in their diets.

"For the patient, the message of these studies is that the recommendation for calcium intake cannot be generalized since the effect of calcium intake on stone formation depends on the type of stone, oxalate intake, presence of stones and the efficiency of calcium absorption from the bowel," said Dr. Pak. "Our future challenge is to understand various factors that modify the effect of calcium restriction on urinary calcium and stone-forming propensity, and to determine how best to use diet and drugs to control hypercalciuria (high urinary calcium) and stone formation."

Also participating in the first study were Dr. Orson W. Moe, director of the Charles and Jane Pak Center for Mineral Metabolism and Clinical Research; Roy D. Peterson, nurse administrator; and John R. Poindexter, software systems supervisor.

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