Long-term calcium and vitamin D supplement use may be linked to increased risk of kidney stones

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Calcium and vitamin D supplements are associated with high calcium levels in the blood and urine, which could increase the risk of kidney stones, a new study finds. The results will be presented Tuesday at The Endocrine Society's 94th Annual Meeting in Houston.

"The use of calcium and vitamin D supplementation may not be as benign as previously thought," said principal investigator J. Christopher Gallagher, M.D., professor and director of the Bone Metabolism Unit at Creighton University Medical Center in Omaha, NE. "Pending further information, people should not exceed the guidelines suggested by the Institute of Medicine, which are 800 international units of vitamin D, and 800-1,200 milligrams per day of calcium."

Taking vitamin supplements has become a widespread practice throughout many parts of the world. In the United States alone, it is estimated that nearly two-thirds of women take vitamin supplements, with calcium and vitamin D among the most commonly used. Despite their popularity, the precise health effects of long-term calcium and vitamin D supplementation remain unclear.

Previous research has indicated that high levels of calcium in the urine, or hypercalciuria, may increase the risk of kidney stones. Elevated calcium in the blood, or hypercalcemia, is associated with many complications, including bone and kidney problems.

Gallagher and study lead author Vinod Yalamanchili, M.D., research fellow in Creighton University's Bone Metabolism Unit, studied 163 healthy, postmenopausal women between the ages of 57 and 85 years. All participants were randomly assigned to receive a vitamin D supplement of 400, 800, 1600, 2400, 3200, 4000, or 4800 international units a day, or placebo. Then, their calcium intake was increased from an initial intake of 691 to 1,200-1,400 milligrams per day. Investigators measured blood and urinary calcium levels at the beginning of the study, and then every three months for one year.

They found that approximately 48 participants, or 33 percent, developed high urinary levels of calcium at some time in the study. These participants had 88 episodes of high urinary calcium. Hypercalciuria has been linked to an increased risk of kidney stones identified in previous studies. No incidents of kidney stones were reported during this one-year study, which was funded by The National Institute on Aging.

Additionally, about 10 percent of study subjects developed high blood levels of calcium. This translates into 25 episodes among 16 participants. In both cases, the increases were unrelated to the dosage of vitamin D.

"Because of the unpredictable response, it is not clear whether it is the extra calcium, the vitamin D or both together that cause these problems," Gallagher said. "However, it is possible that long-term use of supplements causes hypercalciuria and hypercalcemia, and this can contribute to kidney stones. For these reasons, it is important to monitor blood and urine calcium levels in people who take these supplements on a long-term basis. This is rarely done in clinical practice."

Provided by The Endocrine Society

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