Shorts

This study measured cadmium and protein HC (±1-microglobulin) in the urine of 1021 people living in two Swedish communities with nickel-cadmium battery factories. (One plant had closed in 1974; the other was still operating.) Protein HC, a low molecular weight protein, indicates the development of cadmium-induced renal lesions in the renal tubules. Over time, tubular dysfunction can lead to glomerular damage and a decreased glomerular filtration rate. After making an adjustment for age-related protein in the urine, the Swedish researchers found "a positive, highly significant, linear relation...between dose (cadmium in urine) and effect (urinary protein HC)." They discovered that people with urine-cadmium levels of 1 nmol/mmol creatinine (the upper part of normal range) showed a "threefold increase in risk of having increased urinary protein HC." (Creatinine, formed from the metabolism of creatine, is an indicator of kidney function used in blood and urine tests.) An expert group at the World Health Organization set a 'health-based limit' of about 5 nmol Cd/mmol creatinine.

The researchers also found that bone density decreased as urinary cadmium and urinary protein HC increased. They state that other studies have found an increased incidence of kidney stones, osteoporosis, and urinary excretion of calcium among cadmium-exposed workers. Because of the health consequences of cadmium intake, the researchers believe that "measures should be taken to reduce exposure to cadmium in the general population, including lowering of current standards for intake of cadmium in food."


Calcium Intake & Kidney Stones

Recent studies offer conflicting advice about dietary calcium intake and its contribution to kidney stone formation. About 80% of all kidney stones are composed of calcium phosphate or calcium oxalate. The headline for a widely-publicized, 2005 press release from the University of Texas Southwestern Medical Center of Aging recommends restricting calcium intake. A 2004 study, however, that used data from the Nurses' Health Study II found that women with a higher dietary calcium intake had less risk of developing kidney stones.

"UT Southwestern Researchers Find Calcium Intake Contributing Factor In Formation Of Kidney Stones" reads the headline for the university press release and corresponding article at www.sciencedaily.com. The article refers to two studies. The first looks at formation of calcium oxalate stones and appears in Kidney International (November 2004). The other focuses on calcium phosphate stones and appears in the Journal of Urology (December 2005). Both conclude 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." Both studies use data from UT Southwestern's kidney stone registry: 667 patients with predominantly calcium oxalate stones for the first and 133 patients with predominantly calcium phosphate stones for the second. Using "a newer, lower stability constant [mathematical formula]," the researchers found that urinary calcium is as important as oxalate or phosphate in kidney stone formation. However, neither study looked specifically at how much calcium the patients actually consumed. Several conditions lead to increased blood levels of calcium (affecting urinary calcium levels), including primary parathyroid dysfunction, sarcoidosis, hyperthyroidism, and renal tubular acidosis. Yet, two of the authors quoted in the press release take the leap that people with stones "may need to carefully monitor their calcium dietary intake."

In the 2004 study, Gary C. Curhan, MD, ScD, and colleagues examined dietary factors and risk of kidney stone among 96,245 female nurses (age 27 to 44 years) in the Nurses' Health Study II (Arch Intern Med. 2004; 165:885-891). None of these women had a history of kidney stones. The researchers documented the development of 1,223 kidney stones over an eight-year period. "Women who consumed the most calcium (top 20% of calcium intake) had a 27% lower risk of developing kidney stones compared to women who reported consuming the least amount of calcium (lowest 20% of calcium intake)."

In the Background section of the Nurses' Health Study II article, Curhan and colleagues said that previous studies involving older women and men showed that "greater intakes of dietary calcium, potassium, and total fluid reduce the risk of kidney stone formation, while supplemental calcium, sodium, animal protein, and sucrose may increase the risk." This study, involving younger women, showed no association between calcium supplementation and kidney stone risk. The researchers also found that "[w]omen who consumed the most phytate (top 20% of phytate intake) in the study group had a 37% lower risk of developing kidney stones compared to women who consumed the least amount of phytate (lowest 20% of phytate intake)." Phytate inhibits mineral absorption and is found in whole grains, pulses (peas, beans, lentils), and soy beans.

Dietary Calcium Associated with Reduced Risk of Kidney Stones in Younger Women.
www.sciencedaily.com 27 April 2004
UT Southwestern Researchers Find Calcium Intake Contributing Factor in Formation of Kidney Stones. www.sciencedaily.com 19 January 2005

Kidney Disease & Diabetes

Kumar Sharma, MD, at Thomas Jefferson University (Philadelphia, Pennsylvania) and Erwin Böttinger, MD, of Mount Sinai School of Medicine (New York) have identified a protein that may explain why kidney disease is so common among people with diabetes. One in three people with type 1