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Calcium Supplementation and Kidney Stones

I am frequently asked if taking supplemental calcium will increase your risk of developing kidney stones. Many patients and individuals that I consult have experienced kidney stones and have been advised by their physician to stop taking any calcium supplements. This newsletter will review the medical literature and I will share some insight into this problem that you normally will not hear from your doctor. Supplemental calcium intake is not a problem, even if you have had kidney stones and may even reduce your future risk of developing a kidney stone. Now I realize that this is contrary to what many of you have heard from the medical community; however, after a thorough review of the medical literature, this is my conclusion. In this issue of the Healthy for Life Newsletter I am going to be sharing with you some of my findings.

Healthy Lifestyles Reduce the Risk of Kidney Stones

There are many chronic degenerative diseases that are prevented when you develop healthy lifestyles; however, many people do not realize that these same healthy lifestyles that decrease your risk of heart disease, cancer, and diabetes can also decrease your risk of developing a kidney stone. The overwhelming majority of kidney stones are made up of calcium and oxalate. These two minerals may crystallize in the pelvis or drainage area of the kidney and develop what are known as calcium oxalate kidney stones. When they become large enough, they potentially can pass down the ureter (the connecting tube between the kidney and the bladder). When this occurs, it causes some of the most severe pain a person can have and is called renal colic. This small calcium oxalate stone tries to pass through this very narrow muscular tube, which is referred to as the ureter. The ureter literally tries to squeeze this stone through via muscular contractions. Not only does this stone block the ureter and create tremendous back pressure up into the kidney, it also causes an irritation to the inside of the ureter. This combination causes some of the most severe pain a person can experience. What is interesting is the fact that when the stone is not moving the pain will subside somewhat. It sometimes leads the patient to not seek the medical help they need; however, when it begins to move again the pain will quickly get their attention again. Now if the stone does pass spontaneously, the pain will subside on its own.

We generally try to control this severe pain and hope that the stone does pass spontaneously. This oftentimes requires hospitalization in order to control the pain. It is also standard care to strain the patient's urine with a filter in an attempt to capture the stone. If the patient is able to pass the kidney stone on their own, they are often impressed how small the stone really is. It is usually the size of a very small grain of sand. They can't believe that something that small has caused them so much pain. If the stone does not pass, it may require surgical intervention to remove the stone. This may be done through a scope that is passed through the bladder; however, it may require open surgery. A more common practice now is to blast the stone with ultrasonic waves in an attempt to break up those larger stones so that they will pass much easier.

Once the stone is retrieved, it is sent off to the lab to be analyzed and to find out what type of stone it really is. There are several types of stones; however, as I mentioned earlier the majority of

stones are made up of calcium and oxalate. Another common type of stone is called a uric acid stone. This occurs in people who have gout, and the treatment is to treat the underlying gout and decrease the uric acid levels in the serum and thus in the kidney. However, if it turns out to be a calcium/oxalate stone, it is common practice to place these individuals on a diuretic called hydrochlorathiazide and begin to restrict their intake of calcium. This seems to make sense to most physicians since these stones are primarily made up of calcium. However, recent studies have begun to question this recommendation and in fact, have begun to show that instead of decreasing their calcium intake, they should be increasing their calcium intake. Following are some abstracts of just a few of these studies:

Review of Several Clinical Trials:
Williams CP, Child DF, et al. "Why oral calcium supplements may reduce renal stone disease." J Clin Pathol 2001Jan;54(1):54-62

The investigators looked at individuals who were stone formers and gave them calcium supplementation (500mg daily) for a 10-week period and then checked their urine calcium output via 24-hour urine collections. They demonstrated that the amount of calcium when compared to the amount of oxalate was actually reduced, which the researchers felt would reduce the chance of forming calcium oxalate stones in the future.

Curhan GC, Willett WC, et. al. "A prospective study of dietary calcium and other nutrients and the risk of symptomatic kidney stones." N Engl J Med 1993 Mar 25;328(12):833-8

The researchers noted that a high dietary calcium intake is strongly suspected of increasing the risk of kidney stones. However, a high intake of calcium can also reduce the urinary excretion of oxalate, which is thought to lower the risk of developing kidney stones. They felt that it was necessary to actually investigate whether or not increased calcium intake would in fact increase the risk of developing kidney stones.

They looked at the calcium intake of over 45,000 men, who were 40 to 75 years of age and had no previous history of kidney stones. They noted that those men that had the highest intake of calcium had a significantly decreased risk of developing a symptomatic kidney stone than those who had the lowest intake of calcium. This went against the conventional thinking of the medical community. The researchers concluded that encouraging calcium intake in their patients would actually decrease the risk of a symptomatic kidney stone.

Sakhaee K; Poindexter JR; et al. "Stone forming risk of calcium citrate supplementations in healthy postmenopausal women." J Urol 2004 Sep;172(3):958-61

These investigators evaluated the effect of calcium citrate supplementation alone or in combination with potassium citrate on the stone forming propensity in healthy postmenopausal women. They noted that calcium citrate does not increase the risk of kidney stone formation.

Another study that appeared in the Journal of Urology in August of 1994, also showed no increased risk in stone formation with long-term use of calcium supplementation.

De Swart PM; Sokole EB, et al. "The interrelationship of calcium and magnesium absorption in idiopathic hypercalciuria and renal calcium stone disease." J Urol 1998 Mar;159(3):669-72

A decreased concentration of magnesium in the urine is a risk factor for renal calcium stone disease, which may be caused by a decreased intake and absorption of magnesium. Calcium increases the absorption of magnesium and at the same time there is not an increased amount of calcium in the urine. These researchers concluded that supplementing our diet with both

magnesium and calcium would decrease the risk of stone formation.

My Comments:

You have two opposing situations involved with the intake of calcium in individuals who have already had a kidney stone. There is the increased absorption of calcium along with the increased absorption of oxalate. It is becoming evident in several well done studies that calcium intake and absorption actually decreases the absorption of oxalate. Oxalate is the most important culprit in the development of kidney stones. When oxalate levels in the serum and urine are decreased there is a substantial decrease in the risk of developing future kidney stones. Therefore, recommending increased calcium intake along with calcium supplementation makes more sense when it comes to the health of our patients. Not only does the increased intake of calcium, vitamin D, vitamin K, and magnesium decrease the risk of osteoporosis and cardiac arrhythmias, but it also decreases the risk of developing future symptomatic kidney stones. It is important to realize that these supplements of calcium should be taken with food.[i] There have been some reports that if calcium is taken on an empty stomach it does not have the beneficial effect of blocking the absorption of oxalate, and therefore may increase your risk of developing a kidney stone. Having a total intake of 1200 mg to 1500 mg of calcium in your diet and supplementation, which needs to be taken with meals, is not only important for your health, but also, decreases your risk of kidney stones. However, in order to further decrease the risk of developing kidney stones, you need to add some additional healthy lifestyles.

First of all, you need to become very committed to increasing your intake of purified water. Everyone agrees that increased intake of purified water will decrease your risk of future kidney stones. I would recommend getting 8 to 10 glasses (at least 8 ounces each) of purified water in each and every day especially if you have previously suffered from kidney stones. Controlling your weight will also decrease your risk of kidney stones. Taylor EN, Stampfer MJ, et al. reported in the Journal of the American Medical Association (2005 Jan 26 issue) that people who were significantly overweight had a much greater risk of developing a kidney stone.

Other studies have shown that intake of too much protein, sodium, sugar, along with reduced intake of fruits and vegetables, can increase your risk of developing kidney stones.[ii] The more alkaline your foods the greater you decrease your risk of developing a kidney stone. Fresh fruits, vegetables, especially greens, are more alkaline and significantly improve your health as you decrease your risk of kidney stones. Therefore, an overall approach of eating a diet that contains those good low-glycemic carbohydrates, good fats, and good proteins must be added to your supplementation along with the increased fluid intake. These are exactly the recommendations found in the Healthy for Life Program located at www.releasingfat.com. Not only do these lifestyle recommendations decrease your risk of developing heart disease and diabetes, but also, they decrease your risk of developing kidney stones.

A Word of Caution

Restriction of calcium supplementation is the main focus of most physicians who are dealing with patients who have developed calcium oxalate kidney stones. As I have pointed out the clinical studies do not support their concerns, and just the opposite is true. The greater your calcium intake with food the less your risk is of developing kidney stones. However, there are studies that show that when you take vitamin C supplements with your food that the vitamin C actually increases your absorption of oxalate[iii]. Now you have learned that it is not good to do anything that increases your absorption of oxalate. Therefore, you need to take your supplemental vitamin C on an empty stomach. If you have not eaten a meal, there is no increased absorption of oxalate.

Conclusion

I feel that it is important that everyone provide cellular nutrition via supplementing their diet with high-quality, complete and balanced nutritional supplements. I personally recommend either the Usana Essentials or Health Pak. I also feel that it is important that the individual who has suffered from kidney stones consume additional calcium and magnesium in the form of Active Calcium; however, the Active Calcium should be taken with meals. As an additional precaution, I would recommend that the Mega Antioxidant be taken on an empty stomach (this is what contains the vitamin C). I would also recommend that you do not take any additional Poly C or vitamin C. The amount of vitamin C that is in the Essentials or Health Pak is adequate. You should also increase your intake of purified water, fruits, and vegetables, as you decrease your overall intake of protein, sugar, and salt. This offers you the best chance of decreasing your risk of developing a kidney stone or a recurrent kidney stone.

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[i] Curhan GC, Willett WC, et al. "Comparison of dietary calcium with supplemental calcium and other nutrients as factors affecting the risk for kidney stones in women." Ann Intern Med. 1997 Apr 1; 126(7):497-504

[ii] Taylor En, Stampfer MJ, et al. "Dietary factors and the risk of incident kidney stones in men." J Am Soc Nephrol. 2004 Dec; 15(12):3225-32

[iii] Ibid.