



Letters to the Editor

Vitamin C and Kidney Stones: A Comment

Intravenous vitamin C (IVC) has been used for decades by many health care practitioners for a number of indications, particularly cancer and infections.¹ IVC has been shown to be effective at decreasing chemotherapy side-effects and improving overall patient quality of life.² IVC is generally considered to be safe with few adverse effects; however, it has been recommended that IVC be used with caution in patients with renal impairment or failure, or a history of renal oxalate stones.¹

It has frequently been claimed that ingestion of large doses of vitamin C can increase the risk of calcium oxalate kidney stones because vitamin C is converted in part to oxalate. Oxalic acid is an end product of metabolic oxidation of vitamin C. Oxalate nephropathy has been reported after administration of intravenous vitamin C in subjects with renal dysfunction.^{3,4} However, in people with normal renal function, only about 2% of large doses intravenous vitamin C (1.5 g/kg body weight) was found in the urine as oxalic acid six hours after infusion.⁵

The hyperoxaluria associated with the use of high-dose vitamin C has been found to be due primarily to a laboratory artifact, resulting from the conversion of vitamin C to oxalate *ex vivo*, i.e., after it has left the body while it is in the collection bottle.

If there is a small increase in urinary oxalate resulting from ingestion of large doses of vitamin C, that increase might be counterbalanced by other effects of the vitamin. For example, vitamin C binds calcium in the urine, potentially reducing the formation of calcium oxalate crystals; produces a small increase in urinary acidity, thereby increasing calcium oxalate solubility; and possibly decreases urinary stasis by promoting diuresis. Various studies have found either that vitamin C intake is not associated with kidney stone risk or that higher intake is associated with a lower incidence of kidney stones⁶⁻¹² and found no evidence of vitamin C increasing the risk of kidney stone formation.

Moreover, practitioners who have routinely used large doses of vitamin C have not observed kidney stones as a side effect. Despite the apparent safety of vitamin C for the general population with respect to kidney stone risk, there are rare cases in which high-dose vitamin C appeared to cause an increase in urinary oxalate levels. In this population, the risk of oxalate crystallization in the kidney was not increased, in particular since calcium oxalate stones develop over months to years. There is even some evidence that IVC may improve acute kidney injury in critically ill patients and also decrease renal toxicity in oncology patients

receiving chemotherapy.^{13,14}

Among the most important factors in kidney stones is dehydration, especially among the elderly. Ascorbate tends to bind with calcium leaving less calcium to bind with oxalate and, in effect, prevents the formation of calcium oxalate stone.¹⁵

Therefore, we conclude that the statement that high dose intravenous vitamin C causes kidney stones is unsubstantiated and that the concept that high-dose intravenous vitamin C may be contraindicated in people with renal dysfunction and a history of kidney stones should be reviewed.

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Letter to the Editor

References

1. Padayatty SJ, et al. Vitamin C: Intravenous use by complementary and alternative medicine practitioners and adverse effects. *PLoS ONE*. 2010;5:e11414.
2. Carr AC, et al. The effect of intravenous vitamin C on cancer- and chemotherapy-related fatigue and quality of life. *Front Oncol*. 2014;4:1-7.
3. McAllister CJ, et al. Renal failure secondary to massive infusion of vitamin C. *JAMA*. 1984;252(13):1684.
4. Lawton JM, et al. Acute oxalate nephropathy after massive ascorbic acid administration. *Arch Intern Med*. 1985;145(5):950-1.
5. Robitaille L, et al. Oxalic acid excretion after intravenous ascorbic acid administration. *Metabolism*. 2009;58(2):263-9.
6. Heinz-Schmidt K, et al. Urinary oxalate excretion after large intakes of ascorbic acid in man. *Am J Clin Nutr*. 1981;34:305-11.
7. Sutton JL, Basu TK, Dickerson JWT. Effect of large doses of ascorbic acid in man on some nitrogenous components of urine. *Human Nutr*. 1983;37A:136-40.
8. Erden F, et al. Effects of vitamin C intake on whole blood plasma, leukocyte and urine ascorbic acid and urine oxalic acid levels. *Acta Vitaminol Enzymol*. 1985;7:123-30.
9. Tsao CS, Leung PY. Urinary ascorbic acid levels following the withdrawal of large doses of ascorbic acid in guinea pigs. *J Nutr*. 1988;118:895-900.
10. Gerster H. No contribution of ascorbic acid to renal calcium oxalate stones. *Ann Nutr Metab*. 1997;41:269-82.
11. Wandzilak TR, et al. Effect of high dose vitamin C on urinary oxalate levels. *J Urol*. 1994;151:834-7.
12. Gonzalez MJ, Miranda Massari JR. *New Insights on Vitamin C and Cancer*. Springer Briefs in Cancer Research. 2014. Springer New York.
13. Dennis JM, Witting PK. Protective role for antioxidants in acute kidney disease. *Nutrients*. 2017;9:718.
14. Ma Y, et al. High-dose parenteral ascorbate enhanced chemosensitivity of ovarian cancer and reduced toxicity of chemotherapy. *Sci Transl Med*. 2014;6:222ra18.
15. Curhan GC, et al. A prospective study of the intake of vitamins C and B6, and the risk of kidney stones in men. *J Urol*. 1996 Jun;155(6):1847-51.

Re: Dr. Platt and Adrenal Fatigue

Recently I received an email from Dr. Jane Goldberg with some information written by Michael Platt, MD, as an introduction for his new book *Adrenal Dominance*, that I thought may be interesting for *Townsend Letter* readers. Dr. Goldberg writes Dr. Platt's research is fascinating and compelling. While he makes some interesting points, I disagree with his main premise that all adrenal problems are from too much cortisol and that adrenal fatigue is a "misdiagnosis."

He blames false salivary cortisol readings taken by naturopathic physicians for creating a disease that actually does not exist, namely adrenal fatigue. I would think that before anyone came to the conclusion that false salivary cortisol readings were responsible for a false reading, blood cortisol testing would be done at the same time. Also, it may be wise to do the classic 'blood pressure' test.

"Actually does not exist" is pretty conclusive although this is the position of many in mainstream medicine. However from experience over many years and taking into consideration Dr. Plechner's stellar work, there are, in fact, many cases of adrenal fatigue and even adrenal exhaustion.

Dr. Plechner was a veterinarian, and his work with animals (no placebo) and his correlation with humans would conclusively indicate that two-and-a-half to five mgs of prednisone and even better twenty to twenty-five mgs of hydrocortisone (Cortef) may

be "lifesaving." Of course, too much cortisol can lead to Cushing's and too little to Addison's disease.

Also, according to Don Colbert, MD, in his excellent and informative book *Hormone Health Zone*, "excessive cortisol blocks the conversion of T4 to T3. Also increased rT3 production lowers testosterone and increases conversion of testosterone into estrogen." But Dr. Colbert asserts, "the overproduction of cortisol eventually wears the adrenal glands down, resulting in adrenal fatigue and even complete adrenal burnout"; "Cortisol levels plummet, which increases your risk for inflammatory and autoimmune diseases." Symptoms include low blood pressure, weight gain, brain fog, depression, memory issues, as well as constant fatigue.

I'm sure Dr. James L. Wilson would agree. His book *Adrenal Fatigue – The 21st Century Stress Syndrome* is described this way by Amazon: "This is an incredibly informative and reader friendly book about a common debilitating medical condition that very likely affects millions of people."

Also, Dr. Colbert says, "When your adrenals are tired, they produce less of the anti-aging hormone DHEA. Low levels can contribute to chronic infections, Alzheimer's, heart disease, Parkinson's, insomnia, lupus, cancers, accelerated aging, arthritis, wrinkles and sagging skin."

Dr. Norman Shealy knows about the consequences of low DHEA, and at 86 is a fine example of keeping DHEA levels

up. He's written about it in his many books.

However, Dr. Platt does make a good point when he states; "It is important to have the understanding that the primary reason the body is releasing excess adrenaline is simply to raise glucose levels for the brain. However, by giving the brain the fuel it needs, there is a reduced need to use adrenaline. Adrenalin can create stress, stimulating the release of cortisol. Accordingly, there are two fuels the brain uses: glucose and ketones."

If this is true then obviously a ketogenic diet, where the brain runs on ketone bodies instead of glucose, would solve a myriad of health/medical problems. No doubt over-production of adrenaline/cortisol affects millions of people but likewise under-production also affects millions. Would a permanent ketogenic lifestyle largely solve this problem?

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