

Re: Effect of Vitamin C Supplementation on Serum Uric Acid in Patients Undergoing Hemodialysis: a Randomized Controlled Trial

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Dear Editor,

I read with interest the recent contribution by Biniiaz and colleagues,¹ which reported the existence of a significant relationship between vitamin C supplementation and serum uric acid (SUA) levels in hemodialysis patients and found that SUA levels were higher in half of these patients. Hyperuricemia is associated with hypertension and chronic kidney disease. Large epidemiological studies have shown that hyperuricemia is associated with an increased incidence of coronary artery disease and increased mortality in those with and without preexisting coronary artery disease.^{2,3} Hemodialysis patients are exposed to oxidative stress which contributes to cardiovascular disease. A study performed in our center demonstrated that plasma malondialdehyde levels were significantly higher and serum paraoxonase activity, SUA, and albumin levels were significantly lower in hemodialysis patients with cardiovascular disease compared to those of the patients without cardiovascular disease.⁴ However, the Dialysis Outcomes and Practice Patterns Study revealed that higher SUA levels were associated with lower risk of all-cause and cardiovascular mortality in the hemodialysis population in contrast to the association of hyperuricemia with higher cardiovascular risk in the general population.^{2,5} In a recent study, we found that median vitamin C and SUA levels of 34 maintenance dialysis patients who were not given vitamin C treatment were 0.25 mg/dL (range, 0.17 mg/dL to 2.17 mg/dL) and 7.05 mg/dL (range, 4.7 mg/dL to 9.6 mg/dL), respectively, and there was no significant correlation between vitamin C and SUA levels ($r = -0.042$, $P > .05$).⁶

Interference with the results of laboratory tests has been well-documented with ascorbic acid, because as a reducing agent, it interferes with colorimetric redox assays.⁷ Biniiaz and colleagues¹

measured SUA levels by the Sigma enzymatic procedure using colorimetric methods. In our previous study, we investigated the effect of different doses of vitamin C usage on laboratory tests in hemodialysis patients for 3 months.⁸ Ascorbic acid artifactually decreases SUA values assayed by the uricase dye oxidation procedure used on autoanalyzer II.^{7,9} In our study, the effect of the lowest dose of vitamin C (100 mg) led to a net positive interference in SUA levels whereas higher doses (1000 mg and 2000 mg) produced a net negative interference. Besides, we observed a decrease in SUA level with the highest doses of vitamin C which started to increase with the prolongation of the treatment.⁸ Although clinicians have some concerns about active use of higher doses of vitamin C due to the risk of oxalosis, the optimal dosage and duration of vitamin C therapy remain to be established.¹⁰

As a result, the relationship between vitamin C supplementation and SUA levels can be either due to the physiological changes in urate production and elimination or analytical interferences. Detailed investigations are needed to evaluate controversial results.

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