

Fruits, Vegetables Cut Metabolic Acidosis in Kidney Disease

Steven Fox

Feb 14, 2013

Adding fruits and vegetables to the diets of people with late-stage chronic kidney disease (CKD) is an effective alternative to sodium-based alkali supplementation therapy, according to findings from a study [published online](#) February 7 in the *Clinical Journal of the American Society of Nephrology*.

The study was authored by Nimrit Goraya, MD, from the Texas A&M College of Medicine in Temple, and colleagues.

Sodium citrate is commonly used to help ameliorate metabolic acidosis in individuals with CKD, the investigators note. Even so, metabolic acidosis shows up most often in patients with CKD who have very low glomerular filtration rates. Such patients are most at risk for adverse effects of alkali therapy, which may include increased hypertension and/or volume control.

"Because diets typical of industrialized societies have high ratios of acid-producing to base-producing proteins, the latter being mostly fruits and vegetables, adding fruits and vegetables might improve metabolic acidosis in CKD and avoid complications of added Na⁺," the authors write.

To test that hypothesis, these researchers randomly assigned 71 patients with hypertensive stage 4 CKD to 1 of 2 groups.

One group added fruits and vegetables to their diets for 1 year. The vegetables were provided free by a food bank and prescribed by a dietitian. Participants in that group received no specific dietary instructions and added the fruits and vegetables to their diets as they wished.

Prescriptions emphasized fruits and vegetables such as apples, apricots, oranges, peaches, pears, raisins, strawberries, carrots, cauliflower, eggplant, lettuce, potatoes, spinach, tomatoes, and zucchini.

The other group was prescribed 1 year of daily oral sodium bicarbonate (1.0 mEq/kg/day).

Both treatment doses were aimed at cutting dietary acid by half.

After a year of intervention, both groups exhibited evidence of similar kidney function, the researchers say. Plasma total carbon dioxide levels increased in both groups, indicating improvement in metabolic acidosis. However, the investigators note, "Plasma [total carbon dioxide level] at 1 year was higher in the [oral sodium bicarbonate] group (21.2 ± 1.3 versus 19.5 ± 1.5 mM; $P<0.01$) and fruits and vegetables group (19.9 ± 1.7 versus 19.3 ± 1.9 mM; $P<0.01$)."

Both groups had lower indices of kidney damage at the end of the intervention.

In addition, the investigators note, although increased consumption of fruits and vegetables might be expected to drive up serum potassium levels, no significant change was evident in either group.

In an [editorial](#) accompanying the study, Muhammad Yaqoob, MD, from the Bartshealth National Health Service Trust and William Harvey Research Institute, London, United Kingdom, says that although the findings are of interest, they are unlikely to lead to widespread changes in clinical practice.

"A small group of highly motivated patients wishing to reduce their pill burden through dietary modification may benefit from the results of this study," he writes. "However, many patients find it difficult to follow a diet high in fruits and vegetables and might therefore be more adherent to a supplement."

This study was supported by the Larry and Jane Woirhaye Memorial Endowment in Renal Research the Texas Tech University Health Sciences Center, the Statistics Department of Scott and White Healthcare, and the Academic Operations Division at Scott and White Healthcare. The authors and editorialist have disclosed no relevant financial relationships.

Clin J Am Soc Nephrol. Published online February 7, 2013. [Article abstract](#), [Editorial](#)