Should the DASH Diet Be Recommended for Gout Patients?


**Study Overview**

**Objective.** To determine if the Dietary Approaches to Stop Hypertension (DASH) diet is effective for lowering serum uric acid (SUA) levels, and if lower sodium intake as part of the diet would have an effect on SUA.

**Design.** Ancillary study of a randomized, crossover feeding trial.

**Setting and participants.** The original DASH study was an National Institute of Health (NIH)–funded, investigator-initiated trial conducted at 4 university centers in the United States from 1997 to 1999. Participants aged 22 years or older who did not have preexisting renal insufficiency, heart disease, uncontrolled dyslipidemia, or diabetes were recruited. Those on antihypertensives, insulin, or with alcohol intake exceeding daily recommended limits for men (> 14 drinks per week) were excluded. For the current secondary analysis, only subjects from 1 center, where SUA was measured, were studied.

Participants were randomized to a consume a diet consistent with the typical American diet (control diet) or a diet in line with the principles of the DASH diet. For the first 2 weeks, all groups ate the high-sodium control diet. After this 2-week run-in period, the patients in the study then ate the diet they were assigned to for 30 days.

After this 30-day period, participants ate their usual home diet for 5 days. The groups were then crossed over.

**Intervention.** The DASH diet emphasizes fruits, vegetables, and low-fat dairy foods; includes whole grains, poultry, fish, and nuts; and contains smaller amounts of red meat, sweets, and sugar-containing beverages than the typical US diet. It also contains smaller amounts of total and saturated fat and cholesterol and larger amounts of potassium, calcium, magnesium, dietary fiber, and protein than the typical diet. Both diets contained the same number of calories overall. The diets were similar in mg/day of sodium, however, each arm was subdivided to intake either a high (4400 mg/day), intermediate (3000 mg/day), or low (1400 mg/day) level of sodium.

During the study period, all food was provided for participants, including meals and snacks, and was donated by various food vendors in the United States.

**Main outcome measure.** SUA levels, which were measured after each change in diet and at baseline. Other measures were blood pressure, body mass index, renal function, and fasting glucose and lipids.

**Main results.** There were 103 participants with an average blood pressure of 139/87 mm Hg at baseline. Mean
age was 51 years and about half of the patients were women. The majority of patients were overweight (mean BMI, 29.5 kg/m²) and African American (74.8%), with an average SUA level of 5.0 mg/dL. There were 8 participants with a SUA level > 7 mg/dL at baseline. Daily alcohol intake, fasting glucose and triglycerides, renal function, and blood pressure did not differ significantly between the groups.

The DASH diet was effective in lowering SUA levels overall by an average of 0.35 mg/dL ($P = 0.02$). The sodium content had an effect on SUA levels regardless of the diet. The intermediate sodium subset of both the DASH and the control diets resulted in an overall decrease in SUA by 0.34 mg/dL, $P < 0.001$ (0.35 mg/dL for the DASH diet, $P = 0.04$; 0.33 mg/dL for the control diet, $P < 0.001$). There was no difference in SUA between the low- and high-sodium groups. Those participants with the highest SUA at the start of the study had the greatest reduction in SUA. For those with levels > 7 mg/dL, there was a decrease in SUA by 1.29 mg/dL. If the SUA at the start of the trial was lower, reductions were more modest. SUA was reduced by 0.76 mg/dL when the starting level was between 6 and 7 mg/dL. When the participants had a SUA between 4 and 5 mg/dL, the effect of the diet was nonexistent. Other variables such as hypertension and obesity were found not to be confounders.

Conclusion. For participants with SUA levels > 7, an average reduction in serum uric acid of 1.29 mg/dL can reasonably be expected from implementation of a DASH-type diet.

Commentary

SUA is considered an important etiologic factor in gout, but there has been little evidence for success in controlling uric acid with diet. Dietary recommendations for gout patients from the American College of Rheumatology include avoiding organ meats, high-fructose corn syrup, and alcohol in excess, and suggest that beef, lamb, pork, shellfish and sugary beverages should be limited while vegetables and non-fat dairy be encouraged [1].

The DASH diet, promoted by the National Heart, Lung, and Blood Institute to prevent and control hypertension, has been widely disseminated in the popular press and is well known to many Americans. Clinical evidence supporting DASH as first-line nonpharmacologic treatment for high blood pressure is based mainly on the results of 3 trials: DASH Trial [2], DASH-Sodium Trial [3], and PREMIER clinical trial [4]. The DASH diet, while it overlaps with the ACR recommendations of encouraging intake of vegetables and non-fat dairy and discouraging added sugars, recommends as a primary calorie source whole grains, followed by vegetables, fruits, and lean meats, poultry, or fish. One to 2 servings of nuts, seeds, or legumes is also encouraged as well as healthful fats and oils.

The authors’ hypothesis, that the DASH diet would lower uric acid levels as compared with the control diet, was affirmed, with the greater effect seen in patients with higher SUA at baseline. The authors also hypothesized that reducing sodium intake would lower uric acid levels, given its association with high blood pressure. In this study, higher levels of sodium were found to be associated with a decrease in uric acid. The reason for this is unclear and the authors speculate as to why this could be physiologically. The relationship between sodium intake and SUA level is controversial and the authors do not recommend advising an increase in sodium in the diet to lower SUA levels based on their findings.

Long-term dietary change is not easy. It is encouraging that, according to the authors, most of the participants in the study found the DASH diet to be preferable to the typical Western control diet provided and expressed a desire to maintain the DASH style of eating. This is important to consider, as any lifestyle change must be sustained to see continued benefit. The study participants maintained a constant weight, which eliminates this potentially confounding variable as weight reduction alone leads to a reduction in SUA.

While this study showed a positive effect of implementing the DASH diet in those with elevated SUA levels, it excluded those with comorbidities often found in patients with gout, such as cardiovascular disease, diabetes, and renal impairment. This limits generalizability, as does excluding those who consume alcohol beyond the daily recommended quantities—a known risk factor for hyperuricemia. As with any dietary study, it is difficult to know for certain that participants did not eat any foods outside of the study protocol even when the food was provided.

Patients with gout and hyperuricemia are at an increased risk for cardiovascular disease and the metabolic syndrome, making lifestyle interventions and dietary
counselling crucial to the global wellbeing of the patient. Overall, this randomized crossover study provides compelling evidence that the DASH diet should be recommended to patients with hyperuricemia.

Applications for Clinical Practice
For patients with borderline-high SUA (between 6–7 mg/dL), it is reasonable to encourage implementation of the DASH diet with the expectation that SUA will be lowered by about 1.29 mg/dL, getting the patient to goal SUA. As a greater benefit was seen in patients with higher levels of SUA at baseline, it is also reasonable to attempt to lower SUA with a DASH-style diet prior to pharmacologic intervention for higher SUA level if the patient is amenable to trying this tactic.

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References