

## Dietary Soy Can Make a Heart-Healthy Diet Even Better

Welty FK, Lee KS, Lew NS, et al. Effect of soy nuts on blood pressure and lipid levels in hypertensive, prehypertensive, and normotensive postmenopausal women. *Arch Intern Med* 2007;167:1060–7.

### Study Overview

**Objective.** To determine the blood pressure (BP) and lipid level effects of including a half cup of soy nuts per day in the Therapeutic Lifestyle Changes (TLC) diet in postmenopausal women.

**Design.** Randomized controlled crossover trial.

**Setting and participants.** 60 healthy postmenopausal women receiving dietary instruction at a large academic medical center in the United States. At baseline, participants were classified as hypertensive (systolic BP  $\geq$  140 mm Hg or diastolic BP  $\geq$  90 mm Hg) or normotensive (systolic BP  $<$  140 mm Hg and diastolic BP  $<$  90 mm Hg). The normotensive group was further divided into those with systolic BP of 120–139 mm Hg and diastolic BP of 80–90 mm Hg (prehypertensive) and those with systolic BP less than 120 mm Hg.

**Intervention.** A registered dietician provided initial instruction in following the TLC diet currently recommended by the National Cholesterol Education Program. After a 4-week run-in period, study participants who had been adherent to the TLC diet were randomized in a crossover design to 1 of 2 diets: a TLC diet that substituted soy nuts (providing 25 g of soy protein) for 25 g of nonsoy protein or a TLC diet alone consisting of similar protein, fat, and energy levels. The diets were followed for 8 weeks.

**Main outcome measures.** The primary endpoints were changes in systolic and diastolic BP and changes in lipid levels.

**Main results.** Compared with the TLC diet alone, the TLC diet that included soy nuts decreased systolic and diastolic BP by 9.9% and 6.8% in hypertensive women, by 5.5% and 2.7% in prehypertensive women, and by 4.5% and 3.0% in normotensive women. Protein supplementation with soy nuts also reduced low-density lipoprotein (LDL) and apolipoprotein B levels in hypertensive women by 11% and 8%, respectively ( $P = 0.04$  for both); however, it had no effect on lipid levels in the normotensive group.

**Conclusion.** Substituting soy nuts for nonsoy protein in the diet of healthy postmenopausal women results in a significant

reduction in BP levels as well as decreases in lipid levels in those who are hypertensive. These findings may be evidence of an overall cardioprotective effect of soy protein.

### Commentary

Coronary heart disease and stroke are major causes of morbidity and mortality in the United States. Hypertension and hyperlipidemia are the most common modifiable risk factors for these 2 conditions, and billions of dollars are spent each year to reduce BP and cholesterol levels. While drug therapy can be quite effective, diet and lifestyle changes remain a cornerstone of treatment for the long-term reduction of BP and lipid levels. However, most studies of lifestyle modifications have been disappointing due to ineffective or poorly tolerated study designs. Identifying easily adaptable dietary changes that can reduce BP and lipid levels would be immensely helpful in the fight against hypertension and hyperlipidemia.

Taking a cue from the low prevalence of hypertension in populations where soy is consumed in large amounts, Welty and colleagues sought to determine whether dietary supplementation with soy would lower BP and lipid levels. They found that among healthy postmenopausal women, soy supplementation was surprisingly effective, lowering systolic BP by approximately 5% and 10% in the normotensive and hypertensive populations, respectively, and lowering LDL by 11% in hypertensive women. These changes are clinically meaningful and similar to the level of benefit seen from many medications.

The study has 2 important limitations that prevent the findings from being applied to the general population. First, the investigators only examined the effect of soy nuts on healthy, postmenopausal women. Among their exclusions were women with any chronic disease, including diabetes. Individuals with diabetes are at the highest risk for coronary heart disease and stroke and therefore most likely to benefit from strategies to lower BP or lipid levels. It will be critically important to understand whether soy has a similar effect on these patients when compared with the study population. Second, while soy appeared to be effective and well-tolerated in the study, it was tested on a very small number of women who were already on a specialized diet. It is unknown whether most American women would tolerate the addition of soy protein to their diet. Larger studies will be needed to determine if the beneficial effects of soy protein on vessel disease

extend to the diseased population and whether this dietary change will be readily adopted by the general population.

### **Applications for Clinical Practice**

Incorporating soy protein into the diet may be a promising lifestyle modification that can reduce BP and cholesterol levels in healthy postmenopausal women. Whether this

approach is generalizable to men and to those with chronic disease is largely unknown. Based on the study findings, it would be reasonable to encourage women to include soy nuts in their diet for BP and lipid benefits.

—Review by Ashish K. Jha, MD, MPH

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