Eating Blueberries Can Lower Blood Pressure

With hypertension (HTN) affecting nearly 80 million people in the United States and cardiovascular disease (CVD) the leading cause of death, any intervention that can lower blood pressure has the potential to save lives. In a study in the current issue of the *Journal of the Academy of Nutrition and Dietetics*, Florida State University researchers found that daily consumption of blueberries for eight weeks resulted in significant reductions of both systolic and diastolic blood pressure.

Although the prevalence of HTN is associated with aging in both sexes, the increased incidence of high blood pressure, particularly systolic blood pressure (SBP), in women after menopause exceeds that of men. Endothelial dysfunction may play an important role in the increases in blood pressure that occur after menopause. Further, endothelial dysfunction is known to increase arterial stiffness, which is involved in the development and progression of both HTN and CVD. "The recommended intervention for controlling blood pressure in pre- and stage 1-hypertensive individuals is not pharmaceutical interventions, but rather lifestyle modifications including dietary approaches and there is evidence that many cases of HTN can be prevented and treated through diet and lifestyle changes," commented lead author Sarah A. Johnson, PhD, RD, CSO, postdoctoral fellow in the Department of Nutrition, Food and Exercise Sciences and assistant director of the Center for Advancing Exercise and Nutrition Research on Aging, College of Human Sciences, Florida State University. "Considering the prevalence of HTN in the U.S., preventive strategies such as dietary modifications (e.g. functional foods and dietary supplements) that aim to improve HTN and its related complications are warranted."
Forty-eight women who met all inclusion criteria were recruited to participate in an eight-week, randomized, double-blind, placebo-controlled clinical trial. Investigators found that daily incorporation of freeze-dried blueberry powder equating to one cup of fresh blueberries into the diet of postmenopausal women with pre- and stage 1-HTN improved blood pressure and arterial stiffness potentially through enhanced nitric oxide (NO)-mediated vasodilation. Nitric oxide bioavailability is believed to increase endothelial-dependent vasodilation, leading to lower blood pressure.

"To our knowledge, this is the first study to evaluate the effects of blueberries on arterial function as was done in this study, as well as in this study population," said corresponding author Bahram H. Arjmandi, PhD, RD, Margaret A. Sitton professor in the Department of Nutrition, Food and Exercise Sciences and director of the Center for Advancing Exercise and Nutrition Research on Aging, College of Human Sciences, Florida State University. "These findings suggest that blueberries may prevent the progression to full-blown hypertension."
At the conclusion of the study, mean SBP was lower by 5.1 percent and mean diastolic blood pressure (DBP) was lower by 6.3 percent in the subjects in the blueberry group, with no corresponding lowering in the placebo group. In addition, NO measurements were significantly increased in the blueberry group, rising from 9.11 to 15.35 μM, with no change in the control group.

Pulse wave velocity is a non-invasive method for assessing arterial stiffness and has been shown to predict future cardiovascular events. In the current study, brachial ankle pulse wave velocity (baPWV), which is a composite measure of central (aortic) and peripheral arterial stiffness, was

significantly reduced after eight weeks in the blueberry-treated group, whereas there were no changes in the control group. Carotid-femoral pulse wave velocity (cfPWV), the best measure of aortic stiffness, did not change in either group. This suggests that peripheral arteries may be more responsive to dietary interventions than central arteries.

Among all fruits, blueberries are one of the richest sources of phenolic compounds, including flavonoids, phenolic acids, and stilbenes, which are known to have biological activity and high antioxidant capacity. They are a promising functional food with respect to vascular health. "The changes in blood pressure noted in this study are of clinical significance as they demonstrate that blood pressure can be favorably altered by the addition of a single dietary component (e.g. blueberries)," concluded Dr. Johnson.

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