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File: ■ Cranberry (*Vaccinium* spp.)
■ Cardiovascular Disease Risk
■ Type 2 Diabetes

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RE: Cranberry Juice Consumption Lowers Cardiovascular Disease Risk by Altering Glucose and Lipid Profiles in Patients with Type 2 Diabetes

Shidfar F, Heydari I, Hajimiresmaiel SJ, Hosseini S, Shidfar S, Amiri F. The effects of cranberry juice on serum glucose, apoB, apoA-I, Lp(a), and paraoxonase-1 activity in type 2 diabetic male patients. *J Res Med Sci*. 2012;17(4):355-360.

In Tehran, Iran, lifestyle and dietary changes are associated with an increase in the occurrence of type 2 diabetes (T2D), which is a risk factor for dyslipidemia (lipid disorders) and cardiovascular disease (CVD). Cranberry (*Vaccinium* spp.) products are readily available in Iran and offer potential health benefits for people at risk for CVD. Studies have indicated that compounds from cranberries have the potential ability to inhibit low-density lipoprotein (LDL) oxidation and platelet aggregation, as well as induce the expression of the LDL receptor and reduce blood pressure. However, there is limited information available about the effects of cranberries on other combinations of risk factors of CVD in patients with T2D, such as lipoprotein(a) [Lp(a)], paraoxonase-1 (PON1; an antioxidant enzyme associated with high-density lipoprotein [HDL] that is linked to atherosclerosis), and apolipoproteins. Therefore, this double-blind, randomized clinical trial of parallel design aimed to assess the effects of cranberry juice (CJ) on serum glucose, apolipoprotein B (apoB), apolipoprotein A-1 (apoA-1), PON1, and LP(a) in male patients with T2D who take glucose-lowering drugs.

A total of 60 nonsmoking patients with T2D were recruited for the study at Tehran University of Medical Sciences in Tehran, Iran. The inclusion criteria were: patients who had been diagnosed with T2D within the past 5 years; a body mass index (BMI) <30 kg/m^2; glycosylated hemoglobin (HbA1c) <9%; serum triglycerides <400 mg/dl; serum total cholesterol <240 mg/dl; and the use of glucose-lowering drugs (not including insulin). Patients were excluded if they had heart problems or any other health condition that interfered with the study. For the 2-week baseline period, patients consumed a normal diet without any cranberries. Following this period, patients were divided into 2 groups: 1 of which consumed 1 cup (240 mL) of CJ (manufacturer unknown); while the other consumed a placebo drink (strawberry-flavored mineral water; Tazehnoush Company; Shiraz, Iran). Patients maintained their normal diet and physical activity level throughout the study. Dietary compliance was assessed by weekly telephone calls, and

a 24-hour dietary recall questionnaire was completed at the beginning of the study, week 6, and week 12. Blood samples were obtained from the patients at day 0 and at the end of week 12.

A total of 58 male patients with T2D (average age: 54.8 ± 9.1 years; average BMI: 28.8 ± 3.6 kg/m^2) were included in the study (2 noncompliant patients were excluded). There were no significant differences between the 2 groups in body measurements at baseline, nor were there any significant differences in total energy or nutrient intake at the beginning, week 6, or week 12 of the study. At the end of the study, the CJ group had a significant decrease in serum glucose and apoB compared to the starting values ($P<0.01$ and $P<0.05$, respectively) and the control group ($P<0.05$ and $P<0.05$, respectively). There was also a significant increase in PON1 activity and apoA-1 in the CJ group compared to the initial values ($P<0.01$ and $P<0.01$, respectively) and the control group ($P<0.0001$ and $P<0.05$, respectively); however, there was no significant change in Lp(a) at the end of the study compared to the control group or the initial values.

The authors conclude that consuming 1 cup of CJ for 12 weeks effectively reduced serum glucose and apoB, as well as increased apoA-1 and PON1 in patients with T2D who were taking glucose-lowering drugs. The authors state that both apoA-1 and apoB are especially good predictors for CVD. Although the results of this study are encouraging, the mechanisms need to be elucidated. The authors suggest that CJ reduces oxidative stress, a risk factor for CVD, partially by reducing serum glucose and triglycerides, as well as by the direct antioxidant effects of cranberry compounds (e.g., the prevention of LDL oxidation). Therefore, it would have been interesting to also measure plasma antioxidant activity in this study. Surprisingly, the glucose effects of this study were not consistent with previous studies; although, those studies used CJ powder extracts, so the inconsistencies may be due to the heat-altered chemistry of those extracts.[1,2]

—Laura M. Bystrom, PhD

References

[1]Lee IT, Chan YC, Lin CW, Lee WJ, Sheu WH. Effect of cranberry extracts on lipid profiles in subjects with type 2 diabetes. *Diabet Med*. 2008;25(12):1473-1477.

[2]Chambers BK, Camire ME. Can cranberry supplementation benefit adults with type 2 diabetes? *Diabetes Care*. 2003;26(9):2695-2696.

Referenced article can be found at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3526129.