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**FILE: ■ Cranberry (*Vaccinium macrocarpon*)
■ Urinary Tract Infections**

HC 040371-327

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RE: Preventing Urinary Tract Infections with Cranberry Extract

Bailey DT, Dalton C, Daugherty FJ, Tempesta MS. Can a concentrated cranberry extract prevent recurrent urinary tract infections in women? A pilot study. *Phytomed.* 2007;14:237-241.

Common in women, the elderly, and infants, urinary tract infections (UTIs) are defined as the "presence of a certain threshold number of bacteria in the urine (usually greater than 100,000 per mL)." One in four women who have a UTI will have a recurrence. Cranberry (*Vaccinium macrocarpon*) products are often used to prevent UTIs. The authors report on a study to test the effects of concentrated cranberry extract on women with recurrent UTIs.

Most UTIs are caused by one type of bacterium -- *Escherichia coli*. The *E. coli* strains that cause UTIs have proteinaceous macromolecules (fimbriae) that facilitate the adhesion of bacteria to uroepithelial cells in the urinary tract. In vitro and ex vivo studies indicate that cranberry products prevent adhesion of bacteria to the cell walls of the urinary tract, thus preventing UTIs.^{1,2} Further, biochemical studies have revealed that in addition to causing the fimbriae on the surface of the bacteria to become compressed, reducing their adhesion, the proanthocyanidins in cranberry may change the shape of the bacteria from rods to spheres and cause chemical changes in their surface membranes.³

The authors conducted an open-label pilot study for 4 months at Helios Integrated Medicine, PC in Boulder, Colorado. Twelve women aged between 25 and 70 years with a history of 6 UTIs in the past year took 1 cranberry capsule twice daily for 12 weeks. Each capsule contained 200 mg cranberry extract standardized to 30% total phenols (much higher than dried cranberries and dried juices), produced by Phenolics, LLC (El Granada, CA), by selective extraction of the berries. The total cranberry proanthocyanidin intake during the study was approximately 100 mg per day.

All of the women completed a medical history questionnaire at the beginning of the study and were asked to update it with any changes. The women had urinalysis within 24 hours before starting on the cranberry extract and monthly afterward for 4 months.

None of the women developed a UTI during the study, based on symptoms or laboratory results.

After 2 years, a follow-up was done, and the same medical history questionnaire was reviewed with each woman. At that time, eight of the women reported no changes in their health since the study began. They all continued to take various cranberry supplements prepared by different manufacturers in doses ranging from 150 to 300 mg per day, and they continued to be free from UTIs. Four women stopped taking cranberry supplements for various unrelated medical reasons. Of those, one remained free of UTIs and two developed symptoms, which resolved after resuming the supplementation. The fourth developed a UTI confirmed by urinalysis and was treated with antibiotics. She then resumed the cranberry supplements and did not have any further symptoms.

This study adds evidence to three previous studies cited by the authors that indicate the effectiveness of cranberry products in preventing UTIs in women. These study results are unique, however, in that none of the women had a recurrent infection during the study period. Also, this study used a unique cranberry product standardized to 30% phenolics.

The authors suggest that more studies are needed to determine an optimal dose and to compare this product with cranberry juice and other cranberry products containing lower concentrations of proanthocyanidins. Patients who ingest cranberry concentrate products should be cautioned about the risk for nephrolithiasis (kidney stones): urinary oxalate level in 5 volunteers were found to increase by an average 43.4% while receiving cranberry concentrate tablets.⁴

—Shari Henson

References

¹Di Martino P, Agniel R, David K, Templer C, Gaillard JL, Denys P, Botto H. Reduction of *Escherichia coli* adherence to uroepithelial bladder cells after consumption of cranberry juice: a double-blind randomized placebo-controlled cross-over trial. *World J Urol.* 2006;24(1):21-27.

²Liu Y, Black MA, Caron L, Camesano TA. Role of cranberry juice on molecular-scale surface characteristics and adhesion behavior of *Escherichia coli*. *Biotechnol Bioeng.* 2006;93(2):297-305.

³Camesano TA. In: Proceedings of 232nd ASC Meeting, San Francisco, Calif.; September 11, 2006.

⁴Terris MK, Issa MM, Tacker JR. Dietary supplementation with cranberry concentrate tablets may increase the risk of nephrolithiasis. *Urology* 2001; 57(1): 26-29.

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