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**File: ■ Black Chokeberry (*Aronia melanocarpa*, Rosaceae)  
■ Urinary Tract Infections  
■ Elderly**

**HC 031666-553**

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**RE: Black Chokeberry Reduces Incidences and Duration of Urinary Tract Infections in Elderly Subjects**

Handeland M, Grude N, Torp T, Slimestad R. Black chokeberry juice (*Aronia melanocarpa*) reduces incidences of urinary tract infection among nursing home residents in the long term—a pilot study. *Nutr Res.* June 2014;34(6):518-525.

Urinary tract infections (UTIs), caused by bacteria, may impact the bladder, kidneys, or other parts of the urinary tract. Symptoms may be troublesome and severe cases can lead to organ failure. UTIs are commonly treated with antibiotics, but with growing concern about antibiotic resistance with chronic usage, alternative treatments are increasingly necessary. Black chokeberry (also known as aroniaberry; *Aronia melanocarpa*, Rosaceae) has been used by Native Americans for upper respiratory infections, and contemporary research suggests it is one of the most potent antioxidant sources among fruits. This randomized, placebo-controlled, double-blind study investigated the effects of black chokeberry juice on UTI occurrence in elderly subjects in Norway.

Included subjects were chosen from 6 nursing homes in Sandnes, Norway. The study was organized into 4 time periods as follows: period 1 (13 months long, no treatment given); periods 2 and 3 (each 3 months long, either placebo or black chokeberry juice consumed); and period 4 (3 months long, no treatment given). The number of UTIs was assessed from number of days on antibiotic medications for UTI treatment, other usage of antibiotics, number of days using prophylactic medication for UTIs, and consumption of cranberry (*Vaccinium* spp., Ericaceae) juice. Black chokeberry and placebo juice were made by TINE SA; Sola, Norway. No information was given on the processing of black chokeberry. Placebo juice consisted of 6.2% maltodextrin, 6.2% sucrose, 250 ppm bilberry (*Vaccinium myrtillus*) aroma, 200 ppm grape (*Vitis vinifera*, Vitaceae) aroma, and coloring agents to match the black chokeberry juice.

In total, 236 subjects were included in the study—160 women and 76 men, with an average age of 85. Subjects were divided into group A and group B, with 110 and 126 subjects in each, respectively. Group A consumed 300 ml of placebo juice in period 2 and 300 ml of black chokeberry juice in period 3, and group B consumed juice in reverse

order. The groups were studied according to a crossover protocol, but not the subjects. Additionally, the chemistry was measured of both juices, including sugars, minerals, and total phenolic content, using high-performance liquid chromatography, among other methods.

In total, group A consumed an average of 156 ml/day of black chokeberry juice and 233 ml/day of placebo. Group B consumed 89 ml/day of black chokeberry juice and 78 ml/day of placebo. It is mentioned that the intake for subjects was less than the intended dosage of 300 ml daily. Group A ingested black chokeberry juice for 65 days and placebo for 80 days. In group B, duration of consumption was 40 and 30 days for black chokeberry and placebo juice, respectively.

Across the study, the average number of courses of antibiotics per subjects was 1.51, with treatment for UTIs accounting for 55%. When comparing the study period of black chokecherry juice consumption with the preceding period, no differences in UTI frequency were noted. Both groups had a significant and/or directional decrease of amount of days on antibiotics for UTIs from black chokeberry consumption to period 4. [Note: While group A seemed to show a  $P < 0.05$  for this comparison, P values and significance of group B are difficult to determine due to a presumed typo in the manuscript.] The number of infections other than UTIs was not different in either group. There were also no effects on the use of prophylactic drugs for UTIs or the consumption of cranberry juice. It is mentioned that at 3 months after juice consumption, no effects of black chokeberry consumption were observed.

The chemistry of the black chokeberry juice was measured according to the 2 batches manufactured for the study. Total anthocyanin concentration in batch 1 was 3 mg/100 ml and 45 mg/100 ml in batch 2, with cyanidin 3-galactoside the prominent compound. Total proanthocyanidins were 60 mg/100 ml for batch 1 and 72 mg/100 ml for batch 2. A greater amount of sugars was present in batch 1. There were no changes detected in either batch across the study.

This study suggests that black chokeberry may be efficacious in addressing UTIs in elderly people; however, it is discussed that the taste of this juice may be a deterrent in its consumption, as subjects consumed less than the given dosage. A major weakness of this study is the lack of UTI diagnosis or biological parameters, such as urine bacterial count. Also, many aspects of this study were unclear and suffered from lack of accurate description. Overall, the efficacy of this botanical must be confirmed with more rigorous studies. This study was financially supported in part by TINE SA.

—Amy C. Keller, PhD

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