



Can cranberry juice prevent recurrent urinary tract infections?

KONTIOKARI T, SUNDQVIST K, NUUTINEN M, ET AL. RANDOMIZED TRIAL OF CRANBERRY-LINGONBERRY JUICE AND *LACTOBACILLUS* GG DRINK FOR THE PREVENTION OF URINARY TRACT INFECTIONS IN WOMEN. *BMJ*. 2001;322:1571.

OBJECTIVE: To determine whether recurrences of urinary tract infection can be prevented with cranberry-lingonberry juice or with *Lactobacillus* GG drink.

DESIGN: Open, randomized-controlled, 12-month follow-up trial.

SETTING: Health centers for university students and university hospital staff.

PARTICIPANTS: 150 women with urinary tract infection caused by *Escherichia coli* randomly allocated into 3 groups.

INTERVENTIONS: 50 mL of cranberry-lingonberry juice concentrate daily for 6 months or 100 mL of lactobacillus drink 5 days a week for 1 year, or no intervention.

MAIN OUTCOME MEASURE: First recurrence of symptomatic urinary tract infection, defined as bacterial growth $\geq 10^5$ colony-forming units/mL in a clean, voided midstream urine specimen.

RESULTS: The cumulative rate of first recurrence of urinary tract infection during the 12-month follow-up differed significantly between the groups ($P=.048$). At 6 months, 8 (16%) women in the cranberry group, 19 (39%) in the lactobacillus group, and 18 (36%) in the control group had at least 1 recurrence. This is a 20% reduction in absolute risk in the cranberry group compared with the control group (95% confidence interval, 3% to 36%, $P=.023$; number needed to treat=5, 95% confidence interval, 3 to 34).

CONCLUSION: Regular drinking of cranberry juice but not lactobacillus seems to reduce the recurrence of urinary tract infection. (Reprinted with permission from the British Medical Journal.)

EXPERT COMMENTARY: The American cranberry has long been associated with beneficial effects on urinary tract health. It was once thought that this was due to the highly acidic fruit's ability to "acidify" the urine, thereby inhibiting bacterial growth. While some early studies supported this mechanism of action, later investigations determined that the

quantities of cranberry juice needed to significantly lower urine pH were well beyond normally consumed volumes. In 1959, Bodel et al demonstrated that urine pH was only marginally affected after subjects consumed up to 4 L of cranberry juice cocktail daily.¹

Still, research continued to suggest that drinking cranberry juice could reduce the incidence of bacteriuria and urinary tract infections (UTIs). While the methodology of these clinical trials was suboptimal, the search for how cranberry juice could prevent UTIs continued in the laboratory. A breakthrough occurred in 1984 when Sobota demonstrated that in vitro cranberry juice interfered with the adherence of *E. coli* to uroepithelial cells.²

Subsequently, a more precise understanding of the cranberry's mechanism of action has been elucidated. Bacteria, including *E. coli*, have different types of adhesins on their pili, or fimbriae, allowing the organism to adhere to epithelial cells and proliferate. Cranberries contain compounds called proanthocyanidins (PACs) that inhibit the mannose-resistant (P-fimbriated) adhesins found in strains of *E. coli* from binding to the uroepithelium.³

Although Kontiokari et al's recent investigation only included patients with *E. coli* UTIs, it provides a clinical component to the microbiological and biochemical evidence discovered in the laboratory. Furthermore, while it seems that the addition of lingonberry introduces an unknown variable, the wild plant, known as mountain cranberry, actually is a type of cranberry.

BOTTOM LINE: Patients can decrease their risk of recurrent *E. coli* UTIs in vivo by consuming cranberry juice. Therefore, physicians should advise their patients to drink 10 to 16 oz of cranberry juice cocktail daily.

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