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Systematic review and meta-analysis

Updated systematic review suggests that cranberry juice is not effective at preventing urinary tract infection

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Commentary on: **Jepson RG**, Williams G, Craig JC. Cranberries for preventing urinary tract infections. *Cochrane Database Syst Rev* 2012;**10**:CD001321.

Implications for practice and research

- Not all cranberry products contain enough active proanthocyanidins (PACs) for clinical efficacy. Consumers should look for products containing 36 mg of PACs.
- Cranberry is nearly as effective as low-dose antibiotics for urinary tract infection (UTI) prevention in women and children and does not cause antibiotic resistance.

- If cranberry products are being recommended to patients, conclusions of this one review do not provide sufficient reasons to change current practices.

Context

UTIs are a significant public health challenge with more than 15 million cases in the USA each year, with their treatment accounting for 15% of all community-prescribed antibiotics at a cost of \$500 million annually. For decades, cranberry juice and powders have been routinely recommended by healthcare practitioners for

the prevention of UTIs. Meta-analyses of the clinical studies on cranberry are occasionally published by various researchers and organisations. The current review was undertaken by the Cochrane Collaboration as an update to previous reviews published in 1998, 2004 and 2008, and includes some additional studies. The purpose of this review was to assess the effectiveness of cranberry products in preventing UTIs in susceptible populations.

Methods

A total of 24 randomised controlled trials (RCTs) or quasi-RCTs of cranberry products (4473 total participants) were compared for the prevention of UTIs. The types of interventions were cranberry juice or a cranberry product (eg, cranberry capsules, tablets or extract) taken by participants for at least 1 month. The amount taken per day, concentration of the cranberry product and length of treatment were taken into account in the subgroup analyses. The control arms were placebo, no treatment, water, methenamine hippurate, antibiotics or lactobacillus. Information was collected on methods, participants, interventions and outcomes (incidence of symptomatic UTIs, positive culture results, side effects and adherence to therapy). Risk ratios were calculated when appropriate. Quality was assessed using the Cochrane risk of bias assessment tool.

Findings

There was a small trend towards fewer symptomatic UTIs in people taking cranberry products, but they did not significantly reduce overall occurrence, compared with those given placebo or no treatment (RR 0.86, 95% CI 0.71 to 1.04) or in subgroups. The greatest effect was in the two studies in children, but the results did not achieve significance (RR 0.48, 95% CI 0.19 to 1.22). Jepson and colleagues concluded that cranberry was not statistically different from low-dose antibiotics for prevention of UTI in both women (RR 1.31, 95% CI 0.85 to 2.02) and children (RR 0.69 95% CI 0.32 to 1.51).

Commentary

Historically, Cochrane review methodologies have been used to evaluate how drug therapies can treat disease, but they may not be the most effective way to review RCTs on food products.¹ Unlike single-compound drugs, cranberry is a food that comes in different forms (juice, powder, dried, etc) making it difficult to compare results from the different trials using different forms. To further

complicate the meta-analysis, most of the studies used cranberry products that were not standardised to the active bacterial antiadhesion compounds (A-type proanthocyanidins) and may not have had sufficient amounts to achieve clinical efficacy. Compliance in some studies was low, but may have been confounded by the use of poor compliance measures.

Based on the results of their review, Jepson and colleagues recommended that no additional studies be conducted on cranberry juice, as the results would likely be negative. However, the issues with standardisation and compliance in some of the studies strongly suggest that additional trials be conducted using more rigorous methods. Further, results of the Cochrane review need to be put into perspective and weighed against results of other meta-analyses that use different analytical criteria, such as the recent review by Wang and colleagues² in which cranberry use is recommended. Several other studies have been published since the Cochrane review that show significant reductions in UTI recurrence rates in women³ along with associated reductions in antibiotic use in children.⁴ Results of this review suggest there is an opportunity to use cranberry as an alternative to low-dose antibiotics in UTI prophylaxis, and was recommended to consumers by several study authors because of the avoidance of substantial antibiotic resistance issues. Therefore, additional clinical research on UTI prevention using cranberry products is clearly warranted.

Competing interests The author is employed by Rutgers University, Marucci Center for Blueberry Cranberry Research. This Center is focused on researching all aspects of the blueberry and cranberry, including entomology, plant pathology, plant breeding and health benefits.

References

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