

## COCHRANE COMMENTARIES

Edited by Angela Webster (angela.webster@sydney.edu.au)

Written by Ruth Jepson (ruth.jepson@stir.ac.uk)

### Cranberries for the prevention of urinary tract infections

#### What is this review about?

The effectiveness of cranberry products (juice, tablets, capsules and syrup) in preventing urinary tract infections compared with placebo or any other treatment.

#### What are the findings?

Data included in the meta-analyses (Fig. 1) showed that, compared with placebo, water or no treatment, cranberry products did not significantly reduce the occurrence of symptomatic urinary tract infection (UTI) overall (RR 0.86, 95% CI 0.71–1.04) or for any of the subgroups: women with recurrent UTI (RR 0.74, 95% CI 0.42–1.31); older people (RR 0.75, 95% CI 0.39–1.44); pregnant women (RR 1.04, 95% CI 0.97–1.17); children with recurrent UTI (RR 0.48, 95% CI 0.19–1.22); cancer patients (RR 1.15, 95% CI 0.75–1.77); or people with neuropathic bladder or spinal injury (RR 0.95, 95% CI: 0.75–1.20). Overall, there were moderate differences in findings across trials (measured by heterogeneity  $I^2 = 55\%$ ). Gastrointestinal side effects were no more or less likely from cranberry products compared with placebo/no treatment (RR 0.83, 95% CI 0.31–2.27). Many studies reported low compliance and high withdrawal/dropout problems which they attributed to palatability/acceptability of the products, primarily the cranberry juice. Most studies of other cranberry products (tablets and capsules) did not report how much of the ‘active’ ingredient the product contained, and therefore the products may not have had enough potency to be effective.

#### What are the findings based on?

This updated review included a total of 24 studies (six cross-over studies, 11 parallel group studies with two arms; five with three arms, and two studies with a factorial design) with a total of 4473 participants. Overall, the quality of the studies was good, but only five studies undertook power calculations which may mean that the others were too small to detect a difference. Ten studies were included in the 2008 update, and 14 studies have been added to this update. Thirteen studies (2380 participants) evaluated only cranberry juice/concentrate; nine studies (1032 participants) evaluated only cranberry tablets/capsules; one study compared cranberry juice and tablets; and one study compared cranberry capsules and tablets. The comparison/control arms were placebo, no treatment, water, methenamine hippurate, antibiotics, or

*Lactobacillus*. Eleven studies were not included in the meta-analyses because either the design was a cross-over study and data were not reported separately for the first phase, or there was a lack of relevant data for the outcomes we were interested in. Prior to the current update it appeared there was some evidence that cranberry juice may decrease the number of symptomatic UTI over a 12-month period, particularly for women with recurrent UTI. The addition of 14 further studies suggests that cranberry juice is less effective than previously indicated. Although some of small studies demonstrated a small benefit for women with recurrent UTI, there were no statistically significant differences when the results of a much larger study were included.

#### Implications for practice

- The current body of evidence suggest that cranberry products (either in juice or as capsules/tablets) compared with placebo provides no benefit in most populations groups, and the benefit in some subgroups is likely to be very small.
- The large number of dropouts/withdrawals from some of the studies indicates that cranberry products, particularly in juice form, may not be acceptable over long periods of time.
- Cranberry capsules or tablets may overcome some issues with treatment adherence, but from current evidence they do not appear to be any more effective than the juice.
- One of the drawbacks of the studies of non-juice products such as capsules is that few of the trialists reported how much ‘active’ ingredients (if any) were in the tablets or capsules they used. Until there are more studies of products containing enough of the active ingredient, measured in a standardized way, cranberry products cannot be recommended for preventing UTI.

#### Clinical perspective

No definitive mechanism of action has been established for cranberry in the prevention or treatment of UTI. However, research suggests that cranberries prevent bacteria (particularly *Escherichia coli*) from adhering to uroepithelial cells that line the wall of the bladder. Without adhesion, *E. coli* cannot cause infection. One of the potential problems in demonstrating effectiveness is that the active ‘ingredient’ in cranberry products (Proanthocyanidin – PAC) is only effective for around 10–12 h. For cranberry juice to be effective, a patient would need to consume two glasses a day for an indefinite

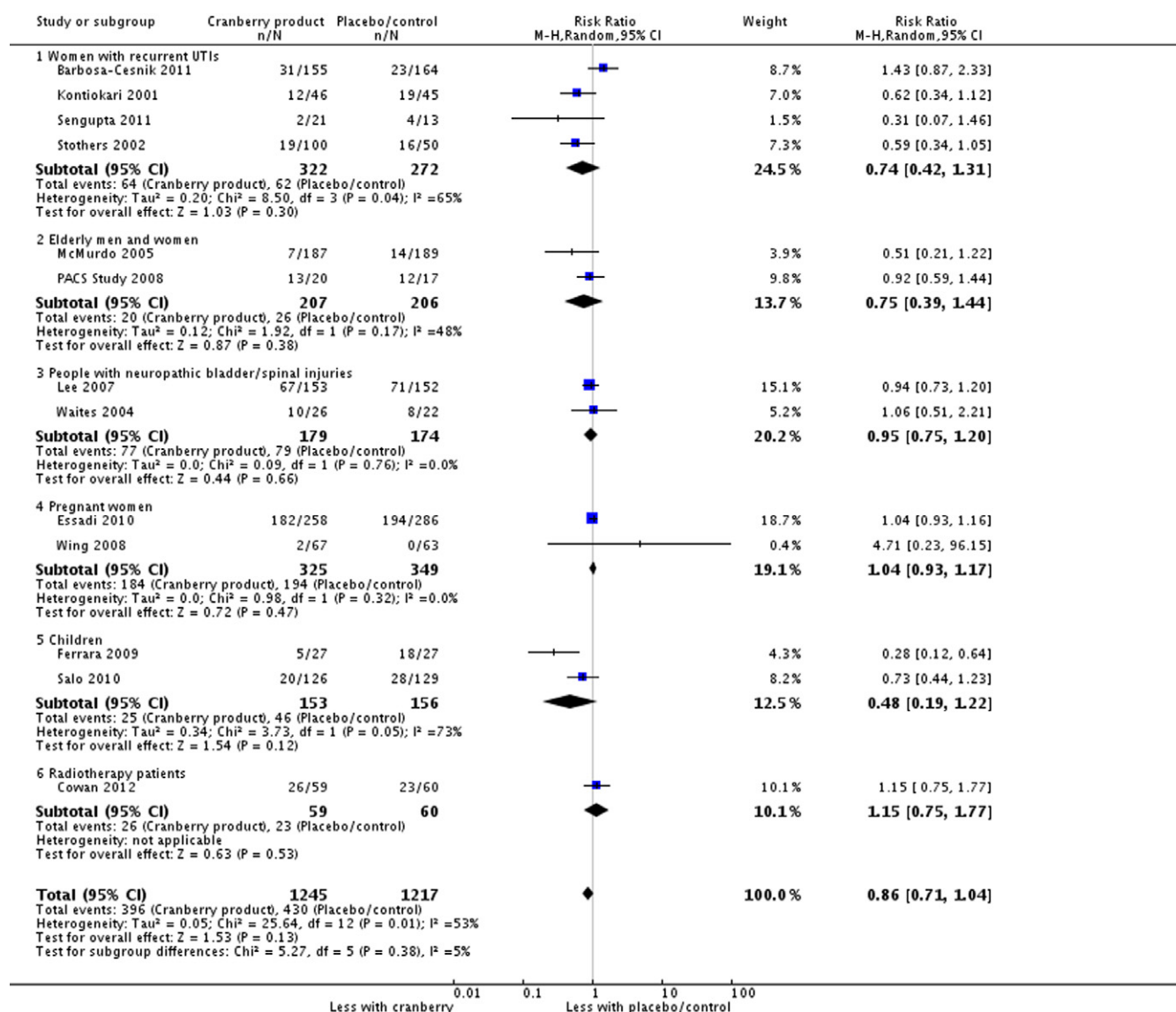


Fig. 1 Risk of one or more UTI during follow up, for trial participants taking cranberry products versus placebo/control.

period of time. Furthermore, cranberry juice is calorific, some people find it unpalatable (and incur side effects such as gastrointestinal upset), and is likely to cost a not insubstantial sum. For cranberry juice to be most effective, a patient would need to be committed to the regimen and not have any other contra-indications (e.g. diabetes). At this time, tablets and capsules should not be recommended unless they clearly contain the recommended amount of PAC (at least 36 mg/day).

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