

Can drinking more water prevent urinary tract infections? The evidence says yes.

Although it is widely recommended to drink more water to prevent recurring urinary tract infections, there has been no clear clinical evidence to support this recommendation. This is the first randomised controlled trial that shows the benefits of drinking more water to prevent these infections.

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EBM Verdict on: Effect of Increased Daily Water Intake in Premenopausal Women With Recurrent Urinary Tract Infections: A Randomized Clinical Trial. JAMA Intern Med. 2018; 178(11):1509-1515. doi: 10.1001/jamainternmed.2018.4204.

To prevent recurrent urinary tract infections the NHS recommends to ‘drink plenty of fluids’ [1], as it helps to “flush out” the bacteria or does it? There is limited evidence to support this recommendation. Clinical studies done in the 1960s, 70s and 80s suggested that increased fluid intake may be beneficial in preventing recurrent urinary tract infections (UTIs), but the evidence was limited to case-control and observational studies, generally from small groups of patients [2]. Some of the evidence was *in vitro* and suggested beneficial effects because of the dilution effect: bacteria nutrition in the urine is reduced rather than a "flushing effect" of more fluids [3]. A recent randomised controlled trial aimed to address the lack of clear, clinical evidence on this topic by assessing the effect of increased daily water intake on recurrent UTIs in premenopausal women [4].

What did they do? The study included 140 premenopausal women (mean age 35.7) who had had recurrent UTI episodes (mean episodes in the previous year was 3.3). Participants were randomly assigned to either drinking 1.5L of water daily in addition to their usual fluid intake or no additional fluids and were followed up over 12 months. The important outcomes, analysed with an intention to treat, were total UTIs and antimicrobial use.

What did they find? On average there were 1.5 fewer UTIs (95% CI, 1.2 to 1.8) in the water group (1.7; 95% CI, 1.5-1.8 vs. 3.2, 95% CI, 3.0-3.4 in the control group). The difference in the mean number of antimicrobial regimens used to treat cystitis episodes was 1.7 (95% CI, 1.3-2.1). There was no difference in adverse events between the groups - the most common was a headache (12 in each group) and gastrointestinal symptoms (8 in each group).

How secure is the evidence? This was a randomised trial, powered to detect a reduction of at least 20% of cystitis episodes in the intervention group - a reduction judged to be clinically

meaningful. It should be noted that this was an open label study and fluid intake was self-reported (objective measures - 24-hour urine volume and osmolality - were assessed at 6 and 12 months). The study is therefore subject to potential observer and/or reporting bias, which may impact on the effect size.

Study participants were selected based on self-reported low daily fluid intake of less than 1.5L, and to be eligible for the study participants had to have a 24-hour urine volume of less than 1.2L. Therefore it could be argued that these results may apply only to women who usually drink less than 1.5L per day. However, one study in 13 countries has shown that on average 40% of women report drinking less than 1.6L daily [5]. Given the demographics of the included population, it is also unclear whether these results apply to a more elderly population, and also whether they apply to men.

It should be noted that the study was funded by Danone Research, which sells bottled water, including the water that was used in the study. Employees of the funder were involved in the design of the study and participated in the interpretation of the data, manuscript preparation, approval and submission.

Overall this was a well-conducted trial, powered to detect a clinically important difference, which has shown that increased water intake is an effective strategy to aid in preventing recurrent cystitis and has the potential to reduce antimicrobial use. Given the potential biases noted and the involvement of the funder in the study, it is possible that the effect size may be overestimated [6], however, even a smaller effect size might still be considered clinically relevant, particularly in light of the low risk of harm.

As noted by other commentators (<https://jamanetwork.com/details/49097070>), a positive feature of this study is also that it reports results from a trial assessing a cheap, non-pharmacological intervention for a common condition, where there is currently limited evidence. Although perhaps not surprising, this study provides evidence for a previously commonly held belief regarding the benefits of increased fluid intake to prevent recurrent urinary tract infections, allowing for clear recommendations to be made. As noted in the accompanying editorial, although bottled water was used in this study it seems clear that any water that is safe to drink is suitable [7].

EBM Verdict: Increasing daily fluid intake to more than 1.5L per day is a safe and inexpensive intervention that can potentially reduce cystitis frequency and antimicrobial use by approximately 50% and should therefore be recommended in healthy women. Practically this could be achieved by, for example, drinking an additional 2 glasses of water with each meal.

Declaration of interests

AP reports grants from NIHR, grants from NIHR School of Primary Care Research, and occasionally receives expenses for teaching Evidence-Based Medicine.

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