ONLINE EXCLUSIVE

Can drinking more water prevent urinary tract infections?

A high-quality randomized controlled trial says 'Yes.'

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PRACTICE CHANGER

Advise premenopausal women with recurrent urinary tract infections (UTIs) and low-volume fluid intake to increase their water intake by at least 1.5 liters daily to reduce the frequency of UTIs.[1]

STRENGTH OF RECOMMENDATION

A: Based on a single, high-quality randomized controlled trial.

Hooton TM, Vecchio M, Iroz A, et al. Effect of increased daily water intake in premenopausal women with recurrent urinary tract infections: a randomized clinical trial. *JAMA Intern Med*. 2018;178:1509-1515.

ILLUSTRATIVE CASE

A 23-year-old nonpregnant woman, whom you treated 3 times in the past year for cystitis, comes to you for follow-up. She wants to know what she can do to prevent another urinary tract infection other than taking prophylactic antibiotics. Should you recommend that this patient increase her daily water intake to prevent recurrent cystitis?

Urinary tract infection (UTI) is the most common bacterial infection encountered in the ambulatory setting. Half of all women report having had at least 1 UTI by the time they are 32 years old.[2] Recurrence is also common, with 27% of women having 1 recurrence within 6 months of their first episode.[2]

Because of growing antimicrobial resistance, the World Health Organization has urged using novel antimicrobial-sparing approaches to infectious diseases.[3] Physicians have long recommended behavioral, nonantimicrobial strategies for prevention of recurrent uncomplicated cystitis. Such behavioral recommendations include drinking fluids liberally, urinating after intercourse, not delaying urination, wiping front to back, and avoiding tight-fitting underwear. However, these behavior modification strategies have been studied largely in case-control trials that have yet to find an association between behavior modification and reduced risk of UTI.[2] Although unproven as a prevention strategy, increasing daily fluid intake has long been a recommendation because of the belief that it helps to dilute and clear bacteriuria.[4] This study is the first non–case-control trial to examine the association between increased fluid intake and decreased UTIs.[1]

STUDY SUMMARY

RCT looks at whether more water leads to fewer UTIs

Hooton and colleagues[1] conducted an open-label, randomized controlled trial (RCT) of premenopausal women with recurrent UTIs and low baseline fluid intake and compared increased fluid intake (an additional 1.5 L/d) with no additional fluids. Participants were provided three 500-mL bottles of water per day and were followed for 1 year. Screened women were included if they had 3 or more symptomatic UTIs in the previous year, 1 culture-confirmed UTI, self-reported fluid intake < 1.5 L /d, and were otherwise in good health. Fluid intake was verified by 24-hour urine collection, requiring a volume < 1.2 L and urine osmolality of ≥ 500 mOsm/kg. Exclusion criteria included a history of pyelonephritis within the past year, interstitial cystitis,

pregnancy, or current symptoms of UTI.

The primary outcome was frequency of UTI during the study period, defined as 1 urinary symptom and at least 10^3 CFU/mL uropathogens in a urine culture. Secondary outcomes included the number of antimicrobial agents used, time to first UTI, mean time interval between cystitis episodes, and adverse events.[1]

A total of 140 participants were randomized with 70 in the water group and 70 in the control group. The mean age of the participants was 35.7 years, and the mean number of reported cystitis episodes was 3.3 in the 12 months prior to the study. By the end of the 12-month study period, mean daily fluid intake had increased by 1.7 L above baseline in the water group. During the 12-month study period, the mean (SD) number of cystitis episodes was 1.7 (95% confidence interval [CI], 1.5-1.8) in the water group compared with 3.2 (95% CI, 3-3.4) in the control group, with a difference in means of 1.5 (95% CI, 1.2-1.8; $P < .001$).

The mean number of antimicrobial agents used for UTI was 1.9 (95% CI, 1.7-2.2) in the water group and 3.6 (95% CI, 3.3-4) in the control group. The median time to first UTI episode was 148 days in the water group compared with 93.5 days in the control group (hazard ratio [HR] = 0.51; 95% CI, 0.36-0.74; $P < .001$) and the difference in means for the time interval between UTI episodes was 58.4 days (95% CI, 39.4-77.4; $P < .001$). No serious adverse events were reported.[1]

This is the first RCT to show that increased daily water intake can reduce the risk of recurrent cystitis in premenopausal patients with low fluid intake who are at high risk for UTI.

WHAT'S NEW

Proof that increased fluid intake reduces the risk of recurrent UTI

Increasing daily fluid intake is a long-held but previously unproven recommendation. This is the first RCT to show increased daily water intake can reduce the risk of recurrent cystitis in premenopausal patients at high risk for UTI and with low fluid intake. No additional risk of adverse events was found.

CAVEATS

Is there a risk of overhydration?

The study did not address the effect of increasing water intake in women who do not have low-volume fluid intake. Case reports of overhydration emphasize the need to be cautious when making recommendations to hydrate.[5] It is not known if physicians should screen for fluid intake at baseline to identify those (with low intake) who would be eligible for this intervention.

CHALLENGES TO IMPLEMENTATION

It's unclear whether the strategy will work without monitoring

The intervention is both low-risk and low-cost to the patient. However, the intervention was supported by home delivery of water and monthly monitoring interventions that are not typical in normal care. Although the clinical intervention of drinking more fluids (primarily water) appears sound, it is not known whether a physician's recommendation would result in the same adherence and risk reduction as water delivery and monitoring. JFP

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