

Randomised controlled trial

Cranberry capsules (2 taken twice daily for an average 38 days) reduce the risk of postoperative urinary tract infection in women undergoing benign gynaecological surgery involving intraoperative catheterisation

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Context

Urinary tract infections (UTI) are a common bacterial infection and postoperative UTIs cause significant morbidity and healthcare burden.¹ Studies examining postoperative antibiotic prophylaxis to prevent postoperative UTI have yielded inconsistent results and antibiotics carry a risk of side effects and bacterial resistance.² Cranberry is well tolerated and widely used to prevent recurrent UTIs. This study investigates the use of cranberry capsules to prevent postoperative UTI following benign gynaecological surgery.

Methods

This randomised double-blind, placebo-controlled trial investigates whether cranberry (2 capsules two times per day, equivalent to two 8 oz servings of cranberry juice) taken for approximately 6 weeks after gynaecological surgery reduces postoperative UTI. Participants were non-pregnant women of age 18 years or older undergoing elective benign gynaecological surgery (excluding fistula repair or vaginal mesh removal) involving intraoperative catheter insertion. Participants were excluded if they had a history of nephrolithiasis, congenital urogenital anomaly, neurogenic bladder, known cranberry allergy or required therapeutic anticoagulation postoperatively. The primary outcome was UTI treatment within 6 weeks of surgery. Secondary outcomes were incidence of *Escherichia coli* (*E. coli*) UTI and time from randomisation to UTI. Randomisation was stratified by age (<60 vs ≥60 years), and participants and providers were masked to treatment allocation. The sample size calculation estimated 200 participants (100 per arm) were needed to demonstrate a 65–75% risk reduction from a 15% to 20% baseline UTI rate. Analysis was by intent-to-treat.

Findings

One hundred and sixty participants were randomised (80 cranberry and 80 placebo—recruitment stopped early due to budgetary and timing

constraints). Over 90% of participants completed one follow-up and 46% completed all three follow-up visits. Most participants underwent surgery for pelvic organ prolapse (67%) or stress incontinence (28%) with a mean age of 47–48 years. The cranberry group had a lower rate of intermittent self-catheterisation (ISC). Overall, 28% (45/160) of participants had a UTI, 77–80% of which were confirmed by urine culture. Cranberry prophylaxis reduced UTI by half (19% (15/80) cranberry vs 38% (30/80) placebo; OR=0.38 (95% CI 0.19 to 0.79), p=0.008). The reduction in UTI with cranberry remained when adjusting for ISC, ISC frequency and discharge with an indwelling catheter (OR 0.42 (95% CI 0.18 to 0.94), p=0.037). *E. coli* was the most common infecting organism. Median time to UTI was 18 days in cranberry versus 8.5 days in placebo (p<0.001). Participants averaged three capsules per day for a mean of 38 days, postoperatively. Cranberry was well tolerated with no significant adverse events.

Commentary

This well-performed trial found that women taking cranberry capsules two times per day for an average of 38 days following benign gynaecological surgery involving intraoperative catheterisation had a 50% reduction in risk of UTI compared with placebo. These results are applicable to many women undergoing benign elective gynaecological surgery as study participants included women of various ages undergoing a variety of procedures. A notable exception is women on anticoagulation due to a potential interaction with cranberry. Importantly, women discharged with an indwelling Foley catheter had a sevenfold higher risk of UTI highlighting the fact that minimising postoperative catheterisation is another way to reduce postoperative UTI. This study did not report on the cost of cranberry capsules as the company provided them for free for the investigation—the potential cost of therapy is an important factor to consider.

The 38% UTI rate in the placebo group was higher than expected and is high compared to the rates reported in the current literature.³ In populations with a lower UTI rate, cranberry may not be as effective. One study examining the utility of prophylactic antibiotics in patients performing ISC after urogynaecological surgery found antibiotic prophylaxis was favoured except when the probability of UTI with prophylaxis was >32% or was <17% without prophylaxis.⁴ This study's results fall within the 'favored' range; however, this study examines cranberry as opposed to antibiotics.

Future areas for investigation include studying cranberry prophylaxis in other patient populations, reproducing these results in similar populations and examining shorter treatment courses to minimise cost and patient burden.

Implications for practice

This study provides level 1 evidence to support the use of cranberry capsules to prevent postoperative UTI in women undergoing elective benign gynaecological surgery involving intraoperative catheter insertion. Minimising the use of indwelling Foley catheters after discharge will also be likely to significantly reduce postoperative UTI.

Competing interests None declared.

Provenance and peer review Commissioned; internally peer reviewed.

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