

Critical Appraisal Topic (CAT)

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Nursing 568

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Clinical Scenerio: A 82 year old female with a urinary tract infection (UTI). The urinalysis showed a white blood cell count (WBC) of 79. The urine culture confirms a $> 100,000$ cfu/ml E. Coli bacteria. This is the fourth UTI for this patient in the past 3 months. Patient's symptoms include; increased confusion, lethargy, poor appetite and foul smelling urine.

Clinical Question: Do cranberry products (cranberry juice or cranberry tablets) reduce the number of recurrent UTIs in the elderly?

Articles:

Jepson, R., & Craig, J. (2009). Cranberries for preventing urinary tract infections. Cochrane Renal Group, (4), . Retrieved from Cochrane Database of Systemic Reviews (CD001321).

McMurdo, M., Bissett, L., Price, R., Phillips, G., & Crombie, I. (2005). Does ingestion of cranberry juice reduce symptomatic urinary tract infections in older people in hospital? A double-blind, placebo-controlled trial. Retrieved from <http://ageing.oxfordjournals.org/cgi/reprint/34/3/256>

Critical Review of Study: Summary of Key Evidence

The Study Design of the meta-analysis provided level 1 evidence and the randomized, placebo-controlled, double blind study provided level 2 evidence.

The sample of the Meta-analysis had included 10 randomized controlled trials (RCTs) or qausi-RCTs if cranberry products for the prevention of UTI in all populations. The randomized control study included 376 older patients in hospital.

The method used in the meta-analysis was the assessment and extraction of information from 1964-2009 from a search of the Cochrane Renal Group, Cochrane Controlled Trials Register, and Central. Electronic databases including PsycLit, LILACS, CINAHL, MEDLINE, EMBASE, Biologic Abstracts and Current contents. English terms and non-english terms were used to identify studies. Ten randomized control trials were selected. Selected were all RTCs of cranberry juice (or derivatives) versus placebo, no treatment or any other treatment. Quasi-RCTs included in meta-analysis were included, but the quality of the studies was taken into account during the analysis and discussion. The randomized control study participants were randomized to daily ingestion of 300 ml of cranberry juice or matching placebo beverage.

Outcomes measured: The meta analysis' primary outcome measure was; number of UTIs in each group (confirmed by a catheter specimen of urine, mid stream specimen of urine (MSU) if possible, or 'clean catch' specimen). Secondary outcome measures were adherence to therapy and side effects. The randomized control trial outcomes measured were time to onset of first symptomatic UTI (defined as a culture-positive urine growing a single organism of greater than 10^4 cfu/ml urine specimen), the impact of cranberry juice ingestion on antimicrobial use, adherence to cranberry amount consumed and responsible organisms in the development of a UTI.

The results of the meta-analysis study concluded that cranberry products significantly reduce the incidence of UTIs at 12 months (RR 0.65, 95% CI 0.46-0.90) compared with the placebo/control group. Cranberry products were more effective in reducing the incidence of UTIs in women with recurrent UTIs, than elderly men. Side effects were common in all studies and dropout/withdrawals in several of the studies were high. In the randomized control trial 21/376 5.6% participants developed a symptomatic UTI: 14/189 in the placebo group and 7/178 in the cranberry juice group. These between-group differences were not significant (RR 0.51, 95% CI 0.21-1.22). There were significantly fewer infections with *Escherichia coli* in the cranberry group 13 vs. 4 (RR 0.31, 95% CI 0.10-0.94). This was a secondary outcome and should be treated with caution.

The bottom line of both studies is there is not strong evidence to recommend cranberry juice for the prevention of UTIs. There is some evidence to recommend cranberry juice for the prevention of UTIs in women with symptomatic UTIs but the evidence is inconclusive as to whether it is effective in older people. There is also no clear evidence as to the amount and concentration as well as the length of time for cranberry to be effective. Both studies showed a negative response to cranberry juice, which was the high dropout rate or non-adherence due to gastrointestinal side effects.

References

Jepson, R., & Craig, J. (2009). Cranberries for preventing urinary tract infections. Cochrane Renal Group, (4), .

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