

Use of cranberry supplements for uti prevention



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Introduction

Urinary tract infections, or UTIs, are one of the most common infections worldwide and according to the National Institute of Health, “ there were an estimated 10. 5 million office visits for UTI symptoms (constituting 0. 9% of all ambulatory visits) and 2–3 million emergency department visits” in 2007 (Flores-Mireles, Walker, Caparon, & Hultgren, 2015). This infection targets primarily women given their anatomy of shorter urethras than males which paves a fast track for bacteria to enter, but UTIs are non-discriminatory. Those who are sexually active, immunocompromised, take certain kinds of birth control, and/ or have a history of indwelling or intermittent catheterization are also at an increased risk for developing this infection (Mayo Clinic, 2017). For uncomplicated UTIs, a healthcare provider prescribes an antibiotic following urinalysis and culture, the patient takes as ordered, and the infection clears within five to seven days. However, given the abuse and misuse of these medications, the threat of antibiotic resistance continues to rise. The Center of Disease Control considers this to be “ one of the biggest public health challenges of our time” and reports “ each year in the U. S., at least 2 million people get an antibiotic-resistant infection, and at least 23, 000 people die” (CDC, 2018). Nurses need to educate our patients on measures avoid these infections rather than treating them at a tertiary level.

Background

The use of cranberry supplements has been widely researched, discussed, and debated as a prevention for recurrent UTIs given its bacteriostatic and

anti-adhesion effect; however, the effectiveness of this intervention appears inconclusive. “ There is an active ingredient in cranberries that can prevent adherence of bacteria to the bladder wall, particularly E. coli,” says urologist Courtenay Moore, MD. “ But most of the studies have shown that juice and supplements don’t have enough of this active ingredient, A-type proanthocyanidins (PACs), to prevent bacteria from sticking to the urinary tract” (Cleveland Clinic, 2017). Although prevention may not be credible, the question remains: “ In high-risk populations, does the use of cranberry supplements cure or prevent the recurrence of urinary tract infections?” The purpose of this scholarly paper is to analyze current research on the effectiveness of this intervention as well as discuss evidence-based practices for nurses now and recommendations for the forthcoming.

Long-Term Care Facility Residents

The first article discussed the use of cranberry supplements in long term care facility residents, a population at high-risk for many opportunistic infections related to their decreased immune system, poor nutritional intake, and declining body systems in general. The study included 21 facilities set in South Holland, the Netherlands with 928 participants, 703 of which were women. To qualify, the participants needed to be at least 65 years or older, have a life expectancy of longer than 1 month and could not be taking Coumadin as there is an interaction between this medication and cranberry. The participants were placed into two sub-groups: low risk or high-risk group constituting those with Diabetes Mellitus Type II, a history of long-term catheterization, and at least one diagnosed UTI in the last year.

Throughout the 12-month study, the participants received cranberry capsules, containing 9mg of proanthocyanidins, twice daily by their unknowing nurse or caretaker. A research nurse then reviewed the participants' charts assessing for a diagnosed UTI. " Because of the absence of a criterion standard in the study population, this study used a clinical definition and a strict UTI definition" (Caljouw, Hout, Putter, Achterberg, Cools, & Gussekloo, 2014, p. 104). Per the article, the clinical definition comprises any of the following: a urinalysis positive for nitrites, leukocytes, or esterase display of micturition-related signs or symptoms (pain during or frequency of voiding, abdominal pain, or foul-smelling urine), a history of UTI in the medical record, or a treatment of antibiotics for suspected UTI. The strict definition of UTI include the symptoms listed above in addition to a positive test of 10⁵CFU/ml, a measurement of bacteria, or more. The results only positively impacted the high-risk group as it relates to clinically defined UTIs with a 26% lower incidence when compared to the placebo. The variables in cranberry products, including capsules versus juice, should be considered significant.

Outpatient Women

A different approach studied the effectiveness of cranberry juice as a prevention towards UTIs in adult female patients. Often, women experiencing urinary symptoms will go out and buy cranberry juice because it's a well known " cure", but the issue remains of varying and inadequate levels of PACs to have any therapeutic effect. This study recruited 24 women between the ages of 30-39 at routine clinic visits with the following criteria: a history of an uncomplicated UTI within the last year and at least an

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8th grade education level. For a baseline, the participants completed two assessment tools including the Interstitial Cystitis Symptom Index (ICSI) and the Interstitial Cystitis Problem Index (ICPI), which were later used for comparison at 2-, 4, and 8- weeks post intervention. Following a literature review, implementation included the participants consuming four ounces of a specific cranberry juice daily 48 hours after completing a short course of antibiotics as this was standard protocol for the clinic. Symptoms and their severity were assessed by self-report at the follow-up clinic appointments which concluded “not at all” responses to pain and burning with urination increased from 54.2% to 87.5% respectively. Final reports stated that consumption of cranberry juice over the 8-week period prompted a substantial decrease in the ICSI, “...from week 2 to week 4 ($p < 0.01$), week 4 to week 8 ($p < 0.0001$), and week 2 to week 8 ($p < 0.0001$)” (Bass-Ware, Weed, Johnson, & Spurlock, 2014, p. 125).

Post-Radiation Males with Prostate Cancer

Cranberry supplements influence on prostate cancer patients with radiation-induced bladder infections by Hamilton, Bennett, Purdie, and Herst, 2014 challenges a bold study because “although several treatments provide symptomatic relief, there is no effective treatment to prevent or treat radiation cystitis” (p. 95). Forty-one New Zealand men with prostate cancer participated in this study and, after one male withdrew, twenty were placed in the control group and twenty in the intervention group. The intervention cohort received cranberry capsules containing 72mg of PACs daily at breakfast during their treatment and the two weeks following, where the control ingested indistinguishable capsules. The assessment tool used in <https://assignbuster.com/use-of-cranberry-supplements-for-uti-prevention/>

this study is referred to as Modified Expanded Prostate Index Composite (EPIC), which is specifically designed to measure quality of life on patients following prostate cancer treatment. EPIC is divided into four areas that assess urinary, bowel and hormonal-related side effects, and sexual function, but for the basis of this particular study, the urinary domain was utilized. Participants completed EPIC on the first day of treatment which included questions on symptoms including frequency of pain and burning on urination, hematuria, loss of control and the burden of these symptoms.

Urinary tract health was divided into two groups based on severity when analyzing the results. “ We defined cystitis as having at least one maximum score of 2 in any of the symptoms or both items. Severe cystitis was then defined having at least one maximum score of 4...” (Hamilton, Bennett, Purdie, & Herst, 2014, p. 99). Out of the 20 in the in cranberry cohort, 13 of the participants developed cystitis and 6 developed severe cystitis during treatment. In contrast, 18 out of the 20 participants developed cystitis and 9 were diagnosed with severe cystitis. None of the participants in this trial developed a urinary tract infection, which is a mentionable result.

Synthesis

As previously stated, Dr. Moore, a urologist, reports the amount of PACs available in most products available to consumers is not enough to prevent adhesion of bacteria to the bladder wall. For a population with impaired metabolism such as the long-term care facility residents discussed by Caljouw, et al. (2014), the 18mg dose of PACs is very low compared to 72mg daily studied by Hamilton, Bennett, Purdie, & Herst (2015). Moreover, the

amount of PACs is not at all discussed with Outpatient Women about ingesting cranberry juice versus supplements. Hamilton, Bennett, Purdie, and Herst's article suggested that cranberry supplements acted as a preventative measure considering none of the participants developed a urinary tract infection during the study, but this was not supported in the other literature. This was also the only study to comment on when to take the supplement. "With respect to the timing of taking the capsules, pharmacokinetic studies have shown that a single dose of elderberry extract [17] and cranberry juice [18, 19] produced maximum anthocyanin levels in urine 3–6 h after consumption [18, 19], indicating that breakfast would be the best time to take the capsule" (Hamilton, Bennett, Purdie, & Herst, 2014, p. 101). Decreased symptom severity, including following implementation of the cranberry supplements was present in the two of the three research articles, but this outcome was not assessed in the Caljouw, et al. chart review. The three studies reviewed included a large, heterogenous sample population, all of whom experienced positive outcomes following the cranberry intervention, with emphasis on decreased symptom severity.

Nursing Implications

Suggesting use of these supplements while collaborating with the interdisciplinary team is one anticipatory and cost-effective measure when focusing on urinary tract health. Screening tools, such as the tuberculosis questionnaire, are conducted already in both the hospital and clinic settings, helping providers conduct an individualized plan of care. Implementing a similar resource specific to urinary symptoms and severity may help with risk reduction by identification of high-risk patients and early preventative

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treatment. This form of policy development falls under the teamwork domain according to QSEN and the public health wheel, ultimately elevating the role of the nurse.

Applications for further nursing research include expanding the study population to other vulnerable individuals such as spinal cord injury patients with impaired bladder function, requiring intermittent catheterization.

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