Cranberry for Prevention of Urinary Tract Infections in the Long-Term Care Setting

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Background:
Urinary tract infections (UTI) are the most commonly diagnosed infections in long-term care (LTC) facilities, with asymptomatic bacteriuria occurring in up to 25-54% of female residents. The prevalence of UTI in men residing in LTC facilities is around half that of women. The management of UTI in older adults living in LTC facilities is complicated, as guidelines recommend against ordering urinalysis and cultures for asymptomatic patients. And while antimicrobial treatment approaches for acute uncomplicated cystitis and pyelonephritis are effective, they increase the risk for adverse events in the elderly population.

UTIs are can cause significant discomfort to those affected; however, older patients receiving LTC may be at risk for additional complications including dehydration, delirium, sepsis, and even death from untreated, complicated UTI. Approaches to prevent UTIs in these patients could reduce these more severe consequences. However, the use of antimicrobial agents to prevent UTI in LTC patients in controversial, due to the increased risk for resistance and adverse effects. Therefore, safe and effective alternatives are needed. Currently, research on the prophylactic effects of cranberry products for UTI is conflicting. The following article will review this evidence to determine if the use of cranberry for the prevention of UTI in LTC patients is a safe and effective approach.

Cranberry Studies:
Current guidelines from the Infectious Diseases Society of America (IDSA) and American Medical Directors Association (AMDA) do not address the use of cranberry products for the prevention of UTI and instead focus on treatment approaches for symptomatic patients. Despite the lack of guidance from these organizations, several clinical trials and meta-analyses have been conducted in this area.

One pooled analysis of 13 clinical trials suggests that taking cranberry products significantly decreases the risk for UTI in both children and adults. Additionally, the results show that cranberry reduces the risk for recurrent UTI in women by almost 50% compared to placebo. This same analysis showed that cranberry juice seemed to be effective for
preventing UTI, while cranberry capsules or tablets were not. The relevance of this study to the LTC population is unclear, as only two of the trials focused specifically on elderly patients. Another pooled analysis of 24 clinical trials compared cranberry products to alternative therapies (e.g., antibiotics) or placebo. The results from this analysis suggest that cranberry products are not effective for the prevention of symptomatic UTI. However, similar to the previous analysis, few of the included trials focused on elderly LTC patients.

Since the publication of these two pooled analyses, two new clinical trials evaluating the effectiveness of cranberry capsules for the prevention of UTI specifically in women residing in LTC facilities have been published. These studies are the best evidence to date on this issue in the LTC population.

The smaller of these two trials, published by Juthani-Mehta, et al. in 2016, was a double-blind, randomized, placebo-controlled clinical trial where 185 women 65 years of age and older living in LTC facilities near Connecticut were randomized to receive two cranberry capsules containing 36 mg of proanthocyanidins or placebo daily for one year. Women with indwelling catheters were excluded from the study. The primary outcome of the study was the presence of bacteriuria plus pyuria. Secondary outcomes included symptomatic UTI, death, hospitalization, bacteriuria associated with multi-drug resistant organisms, and antibiotic requirements. Approximately 28% of patients had diabetes and 30% had one or more episodes of UTI in the previous year. Overall, the prevalence of bacteriuria plus pyuria was 25.5% in the cranberry group and 29.5% in the placebo group. When these results were adjusted for covariates and missing data, the rates of the primary outcome were around 29% for both groups, with no significant difference detected between the groups (p=0.98). Additionally, cranberry capsules did not reduce the risk for symptomatic UTI, death, hospitalization, multi-drug resistant infections, or antibiotics compared to placebo. Information on adverse events was not provided. In the end, the researchers concluded that taking cranberry capsules is not an effective approach for preventing UTI in women residing in LTC facilities.

In 2014, Caljouw, et al. published results from a double-blind, randomized, placebo-controlled clinical trial where 928 women 65 years of age and older living in LTC facilities in the Netherlands were randomized to receive two 500 mg cranberry capsules containing 9 mg proanthocyanins or placebo daily for 12 months. The primary outcome of the study was the incidence of UTI. Two definitions for UTIs were used: clinical and strict. The clinical definition of UTI was based on a scientific approach and included the presence of micturition-related symptoms and signs confirmed with a positive dipslide or culture. The women were stratified into a high UTI risk group and a low UTI risk group. Women with long-term catheterization (>1 month), diabetes, or at least one UTI in previous year were classified as high risk. All other women were classified as low risk. In the low risk group, cranberry did not significantly decrease the risk for clinical or strict UTI. However, in women at a high risk for UTI, taking cranberry capsules decreased the risk for clinically-defined UTI by 26% compared with placebo. Around 39% of women receiving cranberry had a clinically-defined UTI compared to over
47% with placebo (\(p=0.03\)). This suggests that for every 5 women in LTC facilities treated with cranberry vs. placebo over the course of 12 months, UTI will be prevented in one additional patient. A significant difference between groups in the high risk women was lacking with respect to the strict definition of UTI. Information on adverse reactions was not provided, although the authors mention that cranberry capsules were well-tolerated. In the end, the researchers concluded that taking cranberry capsules twice daily for 12 months was superior to placebo for prevention of clinically-defined UTI in women residing in LTC facilities with a high risk for UTI.\(^4\)

Despite this new evidence on the use of cranberry capsules for the prevention of UTI in women living in LTC facilities, several questions still remain. For instance, one pooled analysis suggests that cranberry juice may be more effective than cranberry capsules.\(^6\) However, clinical evidence on the effect of cranberry juice for prevention of UTI in LTC facilities is lacking. It is also unclear if the positive results seen in women at high risk for UTI will also be realized in men. Finally, clinical research on cranberry for UTI prophylaxis in LTC facilities has focused mostly on the incidence of UTI, with secondary outcomes such as hospitalization, severe complications, and death being underpowered to detect a difference if one exists.\(^1,4\) Therefore, more research is needed to determine if cranberry products can improve these outcomes in LTC patients.

**Conclusion:**

The evidence-base on the use of cranberry products for the prevention of UTI is growing. Still, research is mixed. The most recent pooled analysis to date suggests that cranberry products do not reduce the risk for UTIs in a variety of patient populations;\(^7\) however, very few of the trials included in this analysis focused on elderly and/or institutionalized patients. The results a recent clinical trial by Juthani-Mehta, et al. suggest that cranberry capsules are not effective for preventing UTI in women residing in LTC facilities.\(^1\) Because none of these patients had catheters and a majority did not have diabetes or a history of UTI, most of the patients could be classified as having a low risk for UTI. Therefore, the results of this study are consistent with earlier research by Caljouw, et al. which found that cranberry capsules were not effective for preventing UTI in women residing in LTC facilities.\(^4\) However, the study by Caljouw, et al. also evaluated women who were at a higher risk for UTI. In these women, taking cranberry capsules twice daily for up to 12 months did appear to significantly reduce the risk for clinically-defined UTI compared to placebo.\(^4\)

Until more evidence is available, cranberry products should not be recommended for the prevention of UTI in women residing in LTC facilities who have a low risk for UTI. However, cranberry may prevent UTI in women at a higher risk for developing UTIs, including those with catheters, diabetes, or recurrent UTIs. Based on the results of the trial by Caljouw, et al.,\(^4\) the recommended dose and duration of therapy for these women should be two cranberry capsules daily (containing around 9 mg proanthocyanidins) for up to 12 months, as tolerated.
References:


