

## CRANBERRY FRUIT USING FOR TO TREATMENT SYMPTOMATIC URINARY TRACT INFECTION ON INDWELLING URETHRAL CATHETER PATIENTS

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### *Abstract*

#### **Keywords:**

*Cranberry, Indwelling Urethral Catheter.*

**Aim:** We aimed to evaluate efficacy of cranberry using for to treatment of urinary tract infection on chronic indwelling urethral catheter patients.

**Methods:** Seven patients with chronic indwelling urethral catheter who were followed at least one year in urology polyclinic were included to study. Urinary retention reasons are: prostate cancer on two, benign prostatic enlargement on three and neurogenic bladder on two patients. All of patients' urine were malodorous and seem purulent. They were symptomatic. We have suggested to patients cranberry once daily 50 g. After 2 weeks interval, patients were checked about symptoms and urine characteristics. Urinary cultures had been taken.

**Results:** Mean age was 81 years (66-92). Urinary culture was positive all of patients after least two different antibiotic treatments. Urinary cultures were positive on four patients after cranberries treatment. All of patients' urine smell and appearance were normal and had no complaints. Urinary tract infection was relapsed sometimes after treatment. We have seen palpitation on one patient and epigastric pain another one.

**Conclusions:** Chronic indwelling urethral catheter using is a method still practiced for high risk older patient. Antibiotics could not be remedy for symptomatic urinary tract infection. We suggest cranberries using for that patients.

### **Introduction**

Indwelling urethral catheter using is decreasing overtime. Patients who have high risk for anesthesia or using anticoagulation can escape indwelling catheter using by minimal invasive surgery (1). However a lot of patients cannot reach to these treatments around the World, especially in developing or undeveloped countries. Clean intermittent catheterization (CIC) is only treatment for these patients. Indwelling catheter using is only remaining option if patients could not use CIC due to economic or himself reasons.

Catheter-associated urinary tract infection (CAUTI) is the most common health care associated infection (2). Many of these recommendations address CAUTI prevention techniques, indications for catheter insertion, patient factors, specific to nursing practice, such as, insertion technique, catheter materials, management of obstruction, specimen collection, training, surveillance (3,4). However, we cannot prevent urinary tract infection, even if we do everything exactly. Diagnosis of CAUTI is based on finding bacteria, white blood cells on urinalysis with at least two signs of pain or burning urethra or bladder region, fever, malaise, offensive urine odor, change in color or character of urine, bladder spasms, catheter obstruction, increased weakness, change in mental status and bacteremia (5, 6). Antibiotic resistance is natural result of long time antibiotic using. This is not only problem, we know about 3% of all patients with a catheter will develop bacteremia, which is a serious and possibility life threatening complication (7).

Vaccinium macrocarpon (cranberry) products have been studied for UTI prevention and treatment. One proposed mechanism of action is that one of the primary compounds in cranberries, to be complex proanthocyanidins with an

A-type interflavane bond and inhibit P-fimbriated from adhering to uroepithelial cells. P-fimbriae mediate adherence to uroepithelial cells via the P adhesin gene, which contains three unique allelic variants being highly associated with acute cystitis. A large body of documentation was observed in women suffering from recurrent cystitis, but preliminary data from patients suffering from other pelvic conditions, e.g., neuropathic bladder, were also reported. Cranberry decrease adhesion of bacteria to uroepithelial cells, limiting colonization of bladder cells (8-12).

We aimed to evaluate efficacy and adverse event of cranberries using for to treatment of urinary tract infection on chronic indwelling urethral catheter patients.

### Patients- methods

Seven patients with chronic indwelling urethral catheter who were followed at least one year in urology polyclinic were included to study. Urinary retention reasons are: prostate cancer on two, benign prostate enlargement (BPE) on three and neurogenic bladder on two patients. Prostate cancer and BPE patients were excessively risk for anesthesia and taking daily oral anticoagulant or antithrombotic medicine. We could not reach prostatic stent for these patients. These patients and other two neurogenic bladder patients could not do CIC despite of our training program. We change urethral catheter once a month as 18 Fr catheter made by silicon material and urine bag every week. We used ciprofloxacin, trimethoprim-sulfamethoxazole and cefpodoxime for treatment symptomatic CAUTI according to sensitivity tests on first and second steps. We noted urine smell, color and patients' symptoms at pretreatment. Cranberry was suggested to patients, when urinary culture sensitivity tests were reported resistance to last used antibiotics. We have suggested to patients to eat cranberry once daily 50 g at night. After 2 weeks interval, patients were checked about symptoms and urine characteristics. Urine samples had been taken for urinary culture after treatment. We had an interview with patients face to face for to evaluation symptoms and adverse events.

### Results and discussion

Six of patients were male, one was female. Mean age was 81 years (66-92). Urinary culture was positive all of patients after least two different antibiotic treatments before cranberry treatment. Urinary cultures were positive on four of seven (57 %) patients after cranberry treatment. We have seen E. Coli colonization five of seven (71 %) patients' urinary cultures before treatment. But after treatment, E. Coli had been colonized on none of patients' urinary culture.

All of patients' urine were malodorous and seem purulent. They have irritative symptom, suprapubic or urethral pain. All of patients' urine smell and appearance were normal and had no complaints after treatment. Urinary tract infection was relapsed sometimes after treatment. We repeated treatment, patients have been benefited again. Mean relapse time was 2 (1-3) months. Even ten times cranberry treatment was seen effective still. We have followed patients mean 24 (12- 36) months. We have seen palpitation on one patient and epigastric pain another one. We cut treatment patient who had been palpitation. Because, the patient has coronary heart disease and we thought this may be problem. Patient had epigastric pain was treated by proton pump inhibitor. We continued cranberry treatment as sustained for a long time, owing to very often relapse reason.

Between 90% and 100% of patients who undergo long-term catheterization develop bacteriuria (3). The prevalence of needing treatment CAUTI on home care patients is approximately 8% (5). Asymptomatic bacteriuria should not be treated in long-term catheter users. Bacteriuria may be treated in long-term catheter users with symptoms, short-term catheters users such as patients who are immunocompromised, pregnant, or preoperative preparation for urological surgery (13). All of patients we treated have bacteriuria, malodorous, purulent urine color and symptoms. We have not treated asymptomatic patients, even if patients have malodorous or purulent urine color. We cannot embrace the symptomatic CAUTI as a simple entity. Cystitis, periurethral abscess, prostatitis, epididymitis, pyelonephritis, bacteremia and urosepsis may be seemed as complication of CAUTI (14). Traditional treatment is to identify the microorganism causing infection and differentiate that species from other bacteria found in the existing catheter. Begin treatment may be empirical, but the choice of therapy with oral or parenteral antimicrobial drugs should be based on results of sensitivity testing (6, 15). Increasing resistance to traditional first line antimicrobials for UTI and new understanding of how rapidly and sustained resistance becomes after treatment of CAUTI. We have seen effect of cranberry on symptoms, urine odor and color. Urinary culture was positive on 4/7 (57%) patients after treatment. We think this is false positive owing to urine sampling contamination. No symptoms or signs of bacteriuria were seemed after treatment. Campbell et al used cranberry juice for prevention of bladder symptoms in

patients undergoing pelvic radiotherapy. No significant difference observed between groups (16). Therefore, cranberry treatment improves symptoms by treating infection. It is not only symptomatic treatment.

Cranberry including anthocyanins and proanthocyanidins, has been found to prevention of UTI. It was shown that the urinary levels of anthocyanins reached a maximum between 3 and 6 h after oral taken, and the recovery of total anthocyanins in the urine over a day was estimated to be 5.0% of the amount consumed it was also shown that cranberry products can inhibit E. coli adherence to biological systems of primary cultured bladder epithelial cells (17, 18). Outside bacteria of E. Coli had been colonized on urinary cultures in our study after treatment. We think cranberry is very effective on E. Coli colonization; but it's effect is very limited on other bacterias. Cranberry in preventing UTI, analyzing five additional trials and key clinical parameters influencing efficacy: dose, frequency of administration, form of cranberry, and subject characteristics. Subgroup analyses showed better efficacy with cranberry juice than cranberry tablets or capsules, or with dosing more than twice daily (11). So we have tried to find cranberry juice; but we could not find it. Therefore, we used cranberry as fruit form. Cranberry juice as a nonstandardized preparation, so it is therefore unclear what dosage of proanthocyanidin was actually administered, the optimal dosage of which appears to be 36 mg/day (19). So we calculated proanthocyanidin ratio in cranberry and we suggested eating the cranberry 50 g/ day to patients.

Palpitation is very rare adverse event; there is no clinical study relevant this situation. Only very little patient reports present on literature. We had to stop treatment. Epigastric pain was not reported before on literature. Actually cranberry is used for H. Pylori treatment (20). We suggested proton pump inhibitor treatment for this reason and patient's pain was improved.

Cranberry treatment tried on premenopausal, pregnant women, prostate cancer men who were treated by radiotherapy and children with neurogenic bladder at before studies (21-24). This study is the first evaluation the cranberry using on CAUTI around the World literature, as far as we know.

Low patients number and absent of control group may be lacks of study.

*Table-1: Patients' details and outcomes.*

Patient Nu.	Age	Indwelling Catheter Reasons	Urinary Culture Pre-Tx	Urine Colour and Smell Pre-Tx	Symptoms Pre-Tx	Urinary Culture Post-Tx	Urine Colour and Smell Post-Tx	Symptoms Post-Tx	Advers Events
1	92	Prostate cancer	100.000 cfu/ml E.Coli 100.000 cfu/ml E.Faecalis	Malodorous and seem purulent	Suprapubic and urethral pain	100.000 cfu/ml E.Faecalis	Normal	No	Palpitation
2	81	Prostate cancer	100.000 cfu/ml K.Pneumoniae	Malodorous and seem purulent	Irritative symptom	100.000 cfu/ml K.Pneumoniae	Normal	No	No
3	84	Benign Prostatic Enlargement	100.000 cfu/ml E.Coli	Malodorous and seem purulent	Irritative symptom	Clean	Normal	No	No
4	85	Benign Prostatic Enlargement	100.000 cfu/ml E.Coli	Malodorous and seem purulent	Irritative symptom, suprapubic and urethral pain	100.000 cfu/ml E.Faecalis	Normal	No	No
4	78	Benign Prostatic Enlargement	100.000 cfu/ml E.Coli	Malodorous and seem purulent	Irritative symptom, suprapubic and urethral pain	Clean	Normal	No	No

6	81	Neurogenic Bladder	100.000 cfu/ml E.Coli	Malodorous and seem purulent	Irritative symptom, suprapubic and urethral pain	Clean	Normal	No	Epigastric pain
7	66	Neurogenic Bladder	100.000 cfu/ml P.Vulgaris	Malodorous and seem purulent	Urethral pain	100.000 cfu/ml E.Faecalis	Normal	No	No

## Conclusions

Indwelling urethral catheter using is a method still practiced for high risk older patient. Antibiotics could not be remedy for symptomatic urinary tract infection. We suggest cranberry using for those patients. But prospective randomized large study to be done for confirmation our study.

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