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**Perspective**

# Eat Healthy to Keep UTI's at Bay

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## Abstract

Recurrent Urinary Tract Infections (UTIs) are traditionally managed by antibiotics; leads to high health costs and antibiotic resistance. Diet supplementation with alkalizing agents, cranberries, fermented foods, probiotics and vitamins not only alleviates the symptoms but also boosts the immunity against UTIs.

**Keywords:** Urinary tract infections; UTIs; Antibiotics; *E. coli*; Recurrent urinary tract infections.

**Abbreviations:** *E. coli: Escherichia Coli*; L: Litre; OTC: Over the Counter; RUTIs: Recurrent Urinary Tract Infections; UTIs: Urinary Tract Infections.

## Perspective

Eat and drink Urinary Tract Infections and be merry', can state true for treatment and prevention of Urinary Tract Infections (UTIs). These infections rank second throughout the world in morbidity. In certain individuals, UTIs recur, termed as Recurrent Urinary Tract Infections (UTIs) or persistent UTIs. These chronic infections are characterized as either two episodes of symptomatic bacterial cystitis within the last six months or three episodes within the last year. The recurrence causes an adverse effect on the health especially of women and old aged persons [1-3]. Likewise other infections, the prophylaxis of these includes long-term and high dose antibiotics which incurs large financial costs to health-care systems and also, accounts for antimicrobial resistance. Due to long term treatment; the armamentarium of antibiotics which were once effective for treatment of UTIs is now diminishing. Therefore, preventive measures and non-antibiotic alternative therapies are need of hour for the effective management of RUTIs. Recommended preventive measures includes improvement of personal hygiene, which includes pre- or post-coital voiding, increase in frequency of urination, proper wiping patterns, avoiding douching, use of proper undergarments, dis-continuation of spermicides, and use of appropriate vaginal estrogens [3]. Proper nutrition can also boost the human immune system and prevent UTIs. The consumption of uro-protective food items or supplementation of certain nutraceuticals


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can help the body in the battle against uropathogens. Eating berries such as cranberries, blueberries, and raspberries can help to fight off UTIs. The popular Thanksgiving fruit,' Cranberry' can also prove to be thankful for patients of RUTIs. Drinking unsweetened cranberry juice or taking cranberry supplements provides proanthocyanidins and anthocyanidins; prevents bacteria from adhering to the epithelial cells in urinary tract thus reducing the risk of infection. A naturally occurring sugar D-mannose found in cranberries and blueberries can also prevent UTIs. D-mannose which is available in powder or capsule form also prevents uropathogenic bacteria *E. coli* from attaching to sticking to the walls of the urinary tract or bladder.

Diet supplementation with vitamins also strengthens the immune system for UTIs as these are enzymatic antioxidants; slows down the production of free radicals and oxidation. Vitamin A, C and D supplementation has been proven significant in prevention of UTIs. The combination of methenamine and vitamin C, in the distal renal tubules of individuals gets hydrolyzed to methenamine hippurate and formaldehyde. These chemicals are bactericidal, denaturing bacterial proteins and nucleic acids. Administration of alkalizing agents such as sodium and potassium citrate in women helps in curbing of symptoms of UTIs. These have the potential to enhance the efficacy of antimicrobial agents; although widely available in the market as OTC medicines but these have to be used with caution otherwise can be harmful to the patients.

The live bacteria known as probiotics which are found naturally in foods and food supplements are also a good preventive approach for UTIs. The prominent probiotic bacteria *Lactobacillus* can be administered as drinks (yoghurt, juices, and cocktails), fermented foods (pickles and sauerkraut) and supplements. Following intestinal colonization, the friendly bacteria *Lactobacillus* bind to uroepithelial cells, inhibits pathogenic growth and biosurfactant secretion [2,4].

In a study, antimicrobial multispecies probiotic formulations (containing *L. acidophilus* and *L. reuteri*, or *L. plantarum*, *L. rhamnosus* and *Bifidobacterium animalis* subsp. *lactis*) were consumed by pre-menopausal women, reduced the number of uropathogenic bacteria and yeasts. Frequent consumption of probiotic products decreases the recurrence of UTIs; can be safely consumed for a prolonged period. Fiber containing foods such as whole grains, leafy vegetables, bananas, beans, lentils, nuts, oats etc. can combat uropathogens. In the alternative medicine systems, Chinese Herbal Medicine has recorded a history in treatment of UTIs.

According to the Chinese System, UTIs are attributed to 'damp heat of the body'; hence it is recommended that heat clearing foods can alleviate UTI symptoms. In *in-vitro* conditions, some Chinese herbs, such as Huang Lian (*Coptis chinensis* Franch), have shown anti-inflammatory and inhibitory activity against a number of uropathogenic bacteria (including *E. coli*). Other herbs, such as Compound Salvia Plebeia Granules (CSPG), have been shown to reduce *E. coli* adherence to bladder urothelial cells. Chinese herbs used either on their own or with antibiotic treatment are more effective than antibiotics alone in relief and prevention of acute UTIs [5]. The Indian Traditional Medicine System has also


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described dietary restrictions and internal medications for treatment of UTIs which are described as 'Mutrakrucha' as per Ayurveda. The uro-protective herbs can be classified as immune-stimulating and pathogen killing; hence can strengthen and tone immune system of the consumer.

The consumption of anti-septic and anti-adhesive herbs such as *Arctostaphylos uva-ursi* (uva ursi) and *Juniperus spp* (Juniper) protect against acute and chronic UTI. The leaves of *Agathosma betulina* (Buchu) have phenolic compounds and have been traditionally used as an herbal remedy for UTIs, owing to its diuretic and antiseptic properties. A syrup consisting of five components namely, Samshamani vati, gokshuradi, guggulu, sheetprabhba vati, alka has shown effectiveness in the control of UTIs. Chandraprabhavati is another Ayurvedic formulation indicated medicines for Mutrakriccha; consists mainly of Shilajeet (Asphaltum), Sweta Parpati, Moolikshar (extract of the ashes of radish), Sarjikshar, Punarnava (*Boerhavia diffusa*), Gokshura (*Tribulus terresteris*), Varun (*Crataeva nurvala*), Pashan Bheda (*Bergenia ligulata*), Ikshumool (*Saccharum officinarum*), Kulatha (*Dolichos biflorus*) etc. The flavonoids, phenolics and free radicals exert their anti-microbial effects on the causative microorganisms of UTI. These herbs also fire-up the immune system and can police-out the pathogens, can be effective in treatment of RUTIs but should be consumed with physician's approval. Certain foods such as artificial sweeteners, spicy foods, lemon and caffeinated drinks should be avoided as these can exacerbate bladder symptoms in cases of chronic interstitial cystitis. Most important is to stay hydrated; increased water consumption has a dilution and flushing effect; benefits both in prophylaxis and treatment of UTIs. Increased daily intake of at least 1.5l water can reduce the risk of recurrent UTIs.

## Conclusion

Diet supplementation and/or modification with water, herbs and natural botanicals can help in preventing the discomforting UTIs. Preventive approach and prophylaxis of RUTIs should include supplements and natural remedies.

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