

Review Article

Natural approaches for Treatment of Urinary Tract Infections: A Review

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Abstract: Treatment of recurrent urinary tract infections (RUTI) in female is one of the most complicated challenges for the physicians, affecting about 25% of women with a history of RUTI. The increasing costs of antibiotic therapy, the appearance of multi-resistant bacteria and inadequate therapeutic options in recurrent urinary tract infection (RUTI) needs for alternative medical solutions for the treatment of RUTI in the patients. However, long-term antibiotic treatment has been used to treat RUTI. But there is no longer protection due to the bacterial resistance. One of the considerable alternatives is the use of herbs and probiotics to treat complicated and uncomplicated RUTI. Thus the present review article described about use of herbs as well as probiotics in the treatment of RUTI.

Keywords: urinary tract infections, women, antibiotic treatment.

INTRODUCTION

UTI is one of the most common diseases, occurring 40 to 50% of adult women. Recurrent urinary tract infection (UTI) defines a condition in which the urinary tract is infected with a pathogen causing inflammation. The clinical features, diagnosis, treatment and complications may vary depending on the site of infection [1]. *Escherichia coli* is the predominant uropathogen responsible for approximately 80% of RUTI infection, then followed by *Staphylococcus*, *Klebsiella*, *Enterobacter* and *Enterococci* species [2]. Several approaches have been used to the treat RUTIs especially antimicrobial therapy.

Antimicrobial remedy for RUTI

The intention of antimicrobial therapy is to eliminate the bacterial growth in the urinary tract utilizing antimicrobial agent with cost effective manner. The degree of infection is dependent on the susceptibility of the bacteria to the concentration of the antimicrobial agent reached in the urine. Antimicrobial agent can eliminate the bacterial growth in the urinary tract within an hour. An effective antimicrobial agent generally attains minimal inhibitory concentration both in the serum and urine of healthy adults. The urinary levels are frequently many folds larger than the serum levels. However the serum levels are critical in patients with urinary infections [3]. Traditionally, antimicrobial therapy has been used for the treatment of UTIs using either prophylactic or therapeutic approach. Antibiotics such as penicillins, sulfanilamide and cephalexin have been used in the RUTI therapy. However, one major drawback on the usage of antibiotics is the development of antibiotic resistance among uropathogens [4,5]. Therefore, there is an urgent need to develop alternative

treatment options for UTI. This review article discussed about use of herbs as well as probiotics in the treatment of RUTI.

Herbs for Recurrent urinary tract infections

Cranberries are a group of evergreen dwarf shrubs in the subgenus *Oxycoccus* of the genus *Vaccinium*. Most cranberries are processed into juice, sauce and jam. Cranberries have been used as food supplement due to their nutrient content and antioxidant properties. Several studies reported that cranberries have been used for the treatment of UTIs. Effectiveness of cranberry was assessed in UTIs susceptible populations to treat UTI infections. This study indicated that cranberry juice can be recommended for the prevention of UTIs [6]. There is no evidence from *in vivo* studies of cranberries to confirm its potential against UTIs. However, *in vivo* showed the hypothesis that UTIs could be prevented by decreasing bacterial adherence to uroepithelial cells. In addition, routine usage of cranberry products may give an alternative treatment to antibiotic prophylaxis [7]. Cranberry juice and L-methionine have been used to prevent recurrent UTIs. Retrospective analysis was performed to select 82 transplant recipients with recurrent UTIs, who took prophylaxis with cranberry juice (2 × 50 mL/d, n = 39), or L-methionine (3 × 500 mg/d, n = 25) or or both modalities (n = 18). The symptoms, pyuria/nitrituria, and incidence of UTI events during 1 year before versus after initiation of prophylaxis were analyzed. The results indicated that Cranberry juice as well as L-methionine successfully decreased the incidence of UTI in the patients [8]. Ethanol extract of *Z. officinale*, *P. granatum*, *T. chebula*, *O. sanctum*, *C.cassia*, *C. asiatica* and acetone extract of *T. chebula* showed potential antimicrobial

effects against UTI pathogens such as *E. faecalis* (7 isolates) and gram-negative *E. coli*, *K. pneumoniae*, and *P. aeruginosa*. This study suggested that plants are potential source of antimicrobial compounds and also widely used by the tribals. This indicated that herbs will be economic and safe alternative medicines for treatment of urinary tract infections [9].

Probiotics

Probiotics are live organisms and administered in adequate amounts to get a health benefit on the host. The human normal bacterial flora is recognized as vital defence against infection. The usage of antibiotic treatment, there is a linear relation between antibiotic use and reduction of pathogenic bacteria. But the use of antibiotics, the beneficial bacterial flora present in the human body is destroyed [10]. The bacterial flora is essential for body function and more growth of pathogenic microorganisms leads to illness. Thus the human body's normal flora with live microorganisms may give possible beneficial health effect [11].

Usage of probiotics

Probiotics are widely used in yoghurts and probiotic drinks. Many of the microorganisms have been traditionally used by humans for food production, like the fermentation of meat and beverages. The idea of probiotic for medical treatment has existed for many years. Evidence from laboratory research as well as from clinical trials exists to demonstrate the therapeutic effects of live microorganisms [12, 13].

Probiotics for RUTI

Patients with inflammatory bowel disease may have the higher risk of nephrolithiasis, with enteric hyperoxaluria in the fat malabsorptive states. This study indicated that manipulation of gastrointestinal flora could influence urinary oxalate excretion to reduce urinary supersaturation levels in the UTI patients [14]. Women with a history of recurrent yeast vaginitis, bacterial vaginosis as well as urinary tract infections, *Lactobacillus rhamnosus* GR-1 and *Lactobacillus fermentum* RC-14 strains were suspended in skim milk and given twice daily for 14 days. This study showed that probiotic lactobacilli could be effective in the prevention of urinary tract infections [15]. Safety and efficacy of bacterial interference were studied in preventing of urinary tract infection. Pilot clinical trial was performed in the patients with spinal cord injury who had neurogenic bladder as well as frequent episodes of symptomatic UTI. The bladder of patients was inoculated with a non-pathogenic strain of *Escherichia coli* 83972. This study indicated that bacterial interference using *E. coli* 83972 could be safe and effective in preventing the urinary tract infection [16]. A clinical pilot study was performed to validate the safety and effectiveness of *Lactobacillus* vaginal suppositories against the recurrence of bacterial urinary tract infection in the patients. This study indicated that administration of vaginal suppositories containing *L. crispatus* GAI 98332 could be a safe for the treatment of recurrent UTI [17].

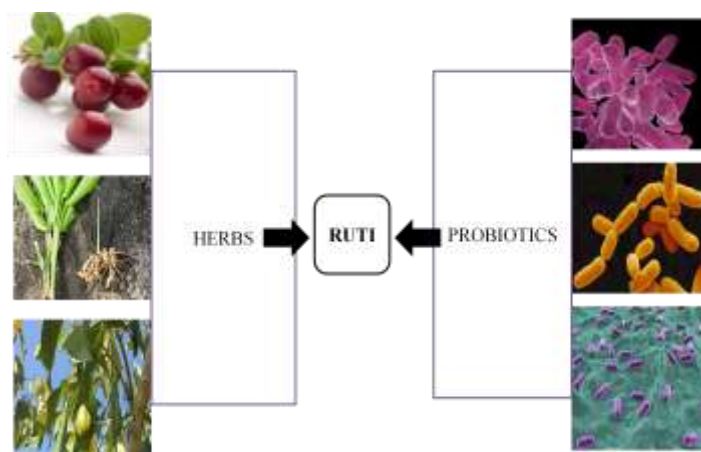


Figure 1: Herbs and Probiotics for RUTIs

CONCLUSION

The plants are potentially rich in antimicrobial compounds and medicinal plants are safe and economic for the treatment of urinary tract infections. Another alternative treatment is the use of probiotics to prevent and treat recurrent complicated as well as uncomplicated urinary tract infection. Both herbs and probiotics showed promise effects to control or prevent the RUTIs. The herbs and probiotics may become an alternative treatment option for UTIs. However, insufficient scientific data exists to support the routine

use of herbs and probiotics in the treatment of urological disease such as RUTI. Therefore, adequate basic research as well as clinical research should be carried out for the usage of herbs and probiotics in the prevention or treatment of RUTI.

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