



**ORIGINAL RESEARCH PAPER**

**Pharmacology**

**LOWER URINARY TRACT SYMPTOMS (LUTS): A PUBLIC HEALTH MENACE - A STUDY ON ASSOCIATION OF RECURRENT URINARY TRACT INFECTION WITH CHRONIC BACTERIAL PROSTATITIS IN INDIAN MEN**

**KEY WORDS:** Chronic bacterial prostatitis (CBP), lower urinary tract symptoms (LUTS), recurrent urinary tract infection (recurrent UTI), urinary tract infection.

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**ABSTRACT**

**Background:** Recurrent urinary tract infection (UTI) in men is likely to be secondary to associated conditions such as prostatitis, prostatic hyperplasia or vesico ureteral reflux (VUR). Recurrent urinary tract infections may be associated with significant morbidity and even mortality with bothersome lower urinary tract symptoms. Chronic bacterial prostatitis being a critical risk factor for recurrent urinary tract infection, various measures are being explored to develop better algorithms for treatment and develop strategies for its prevention. **Objectives:** As such this study was planned to evaluate the association of recurrent UTI with chronic bacterial prostatitis in Indian men over a period of one year. **Material & Methods:** Prostatic secretion specimens were collected from men with "culture confirmed" recurrent UTI for further processing to diagnose the associated chronic bacterial prostatitis using Meares - Stamey technique. **Result:** It was observed that among 66 men presenting with culture confirmed recurrent UTI, 13.64% subjects had associated CBP. It was also observed that 76.92% of recurrent UTI cases were found to be in the elderly men more than 70 years; whereas, the prevalence of CBP associated with RUTI was 66.66% among elderly men more than 60 years. **Conclusion:** Recurrent UTI in men is associated with CBP; as such, modifications in the management of RUTI have to be made on the basis of associated CBP and the pattern of antimicrobial susceptibility results. It is hoped that findings from this study would be helpful in ensuring effective management of recurrent UTIs and reduce the associated complications.

**Introduction**

Urinary tract infections in men are usually complicated with an underlying anatomic or functional condition. Recurrent urinary tract infection (UTI) in men is likely to be secondary to associated conditions such as prostatitis, prostatic hyperplasia, calculi in the genitourinary tract or vesico ureteral reflux (VUR) (1). Overall, prostatitis is a common presentation in the clinical setting and tends to occur in young and middle-aged men; accounting for almost 2 million office visits per year (2). Although, both acute and chronic bacterial prostatitis are associated with urinary infection; relapsing UTI in men is generally associated with chronic bacterial prostatitis (CBP) which is a sub acute infection and a source of chronic disability (3). Recurrent urinary tract infections may be associated with significant morbidity and even mortality with bothersome lower urinary tract symptoms (LUTS) that can lead to decreased ability to engage in activities of daily living and incur a significant economic burden too. (4) This is particularly true in the frail elderly and in those with associated urogenital complications leading to urosepsis and death. Worsening the situation even more is the fact that recurrent urinary tract infections associated with urogenital tract infections might be misdiagnosed and inadequately treated as simple recurrent urinary tract infections (5). Although the initial therapy of UTIs is usually empirical, subsequent modifications have to be made on the basis of associated urogenital infections and the urine culture & susceptibility results. Since the prostate is involved in the majority of cases of UTI in men, the goal in these patients is to eradicate the prostatic infection as well as the bladder infection (6). Hence, chronic bacterial prostatitis being a critical risk factor for recurrent urinary tract infection, various measures are being explored to define the natural history and consequences of prostatitis, develop better algorithms for diagnosis and treatment, and develop strategies for its prevention. In this regard, very few studies have been carried out and very scarce data is available on Indian men. As such we have planned this study to evaluate the association of recurrent UTI with chronic bacterial prostatitis. It is hoped that the data generated from this study will help in developing guidelines for the management and prevention of the lower urinary tract symptoms; which is a great public health menace.

**Material and Methods**

This study was conducted under the joint auspices of department of pharmacology and department of general medicine at a tertiary care teaching hospital – Mandhana, Kanpur; for a period of one year. The study was a simple random sample, hospital based, epidemiological descriptive study; conducted after due approval from the institutional ethics committee. A total of 66 male patients with "culture confirmed" recurrent UTI, in consistence with the definition of RUTI, which is 2 or more than 2 episodes of UTI in a period of 6 months (7); visiting the outpatient clinics of the tertiary care hospital were included in the study. Patients diagnosed with any renal disease, patients suffering from STDs, patients on immunosuppressants, patients suffering from any chronic illness, bedridden patients, paraplegics and neurogenic bladder cases were excluded from the study. Patient information, clinical symptoms and laboratory findings were recorded in a structured questionnaire. A detailed medical history was collected from all consenting patients for eligibility screening. A written/verbal informed consent was taken from each patient enrolled. The patients were further evaluated to diagnose the associated chronic bacterial prostatitis (CBP) based on microscopy and culture study of the expressed prostatic secretions (8). Prostatic secretion specimens were collected by post digital prostatic massage, following the Meares - Stamey technique (9). Evidence of prostatic inflammation was based on the leukocyte count in expressed prostatic secretion compared to the first urethral sample and midstream urine sample.(10) The leukocyte count in prostatic secretion increases following sexual intercourse and ejaculation; hence, patients were advised to abstain prior to any planned collection of split urine samples. Culture of expressed prostatic secretions being the gold standard test, was done for confirmation of CBP. Well labelled specimens were put up for culture within an hour of receiving the samples. In case of any delay, the samples were kept in refrigerator at 4°C.(11) The patients were prescribed the conventional treatment for RUTI by the concerned physician after collecting the required specimens.

**Statistical Analysis**

Data analysis was performed using the SPSS windows version 16.0 software. Tests of significance like Pearson's chi-square test and

Fisher Exact test were applied to find out the results. A value of  $P < 0.05$  was considered statistically significant. The association (risk) of recurrent urinary tract infection with chronic prostatitis was assessed by calculating the odds ratio.

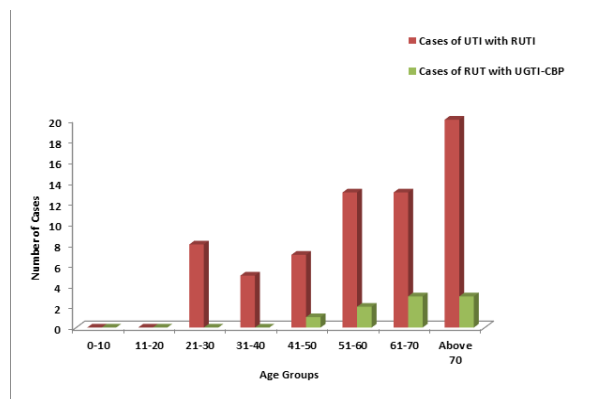
**Results**

A total of 66 culture confirmed RUTI patients attending the out-patient department of the tertiary care hospital were enrolled in the study and evaluated further for association with CBP.

**Table – 1: Distribution of male Recurrent UTI cases and associated CBP as a function of age.**

Age Groups (year)	Cases of RUTI (%)	Cases of RUTI with CBP (%)
0-10	0	0
11-20	0	0
21-30	8 (53.33)	0
31-40	5 (38.46)	0
41-50	7 (46.66)	1
51-60	13 (72.22)	2
61-70	13 (72.22)	3
Above 70	20 (76.92)	3
<b>Total</b>	<b>66 (56.90%)</b>	<b>9 (13.64%)</b>

From the observations of our study, it is reflected that among a total of 66 culture confirmed recurrent UTI male patients, 13.64% patients had associated CBP. It was also observed that 76.92% of recurrent UTI cases were found to be in the elderly men more than 70 years of age; whereas, the prevalence of CBP associated with RUTI was 66.66% among elderly men more than 60 years of age.



**Fig. 1:** Distribution of recurrent UTI and associated Chronic Bacterial Prostatitis as a function of age.

**Discussion**

Recurrent urinary tract infection is a public health concern, presenting with bothersome LUTS and associated with significant morbidity and even mortality. The pragmatic definition of recurrent UTI is two proven episodes of UTI within 6 months or three episodes within a year (7). On the other hand, inflammatory or irritative conditions of the prostate have a common clinical presentation, often representing with distinct pathogenic processes that may benefit from different management approaches. According to the International Prostatitis Collaborative Network for classification of prostatitis established by the United States National Institutes of Health, chronic bacterial prostatitis, is characterized by chronic or recurrent lower urinary tract symptoms (LUTS) in the setting of documented or suspected bacterial infection of the prostate (12). The presentation of chronic bacterial prostatitis is typically subtle or even asymptomatic; being noted incidentally on presenting with symptoms of recurrent UTI.(13) In clinical practice, chronic bacterial prostatitis is usually presumptively diagnosed in men with chronic or recurrent LUTS. It is as such highly suggested that, male patients with history of RUTI should be routinely investigated for associated CBP. The main differential diagnosis in a case consistent with chronic bacterial

prostatitis is chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS), where the presentation may be the same, but with no clear evidence of a bacterial infection making the diagnosis of CBP most probable and not absolute. Adding to the indecisiveness of diagnosis it is has also been found that some patients with CP/CPPS respond to antibiotic therapy despite lack of a clear bacterial infection. Hence, the study of association of CBP with recurrent UTI is a subject involving various prostatitis syndromes with overlapping definitions, presentation and risk factors. As per our literature research very less data related to our study, prostatitis or recurrent UTI is available in Indian population making the study a necessity and highly significant for an effective management and prevention.

It was observed in our study, that on further evaluation of the 66 men with culture confirmed RUTI, 13.64% (9/66) subjects were diagnosed with chronic bacterial prostatitis. From the distribution of cases as a function of age, we observed that recurrent UTI is found to be higher in the elderly men more than 70 years of age, which was recorded to be 76.92% (20/26). The prevalence of CBP associated with RUTI was observed to be as high as 66.66% (6/9) among the elderly men more than 60 years of age and was quite rare in the early age groups.

The prevalence of prostatitis in general population is found to be 8.7%, whereas CBP comprises 10% of all the cases of prostatitis (14). Hence, it is obvious that the prevalence of CBP in men with RUTI would be higher as compared to the general population which is in accordance with our study results.

However, on evaluating the distribution pattern of CBP associated with recurrent UTI as a function of age, it was observed from our study data that 67% (6/9 = 66.66%) of the cases with CBP were among the elderly age group of more than 60 years and was quite rare in the early age groups (2), (4).

Affirming our findings is another study by Daniels et al (15), where the results from the Boston Area Community Health (BACH) survey established a high association of recurrent urinary tract infections with CBP.

Results matching that of our study were observed by Weidner et al (16), in a thorough search for etiology of prostatitis in 1461 patients, from 1976-1988 with complaints of chronic prostatitis. CBP was culture confirmed in 10.2% cases with E.coli being the most prevalent microorganism.

Moon et al; in a study evaluating lower urinary tract infection symptoms, in 20-49 year old men in Wisconsin National Guard unit, established a history of chronic bacterial prostatitis in 5% of the 184 participants. The prevalence of CBP in our study is higher because we have evaluated culture confirmed and recurrent UTI cases, where CBP is a major risk factor.

Prevalence similar to our study was also observed by Krieger et al (17), who compared the prevalence of prostatitis symptoms in five studies surveying 10617 men. Overall, 873 participants met various criteria for chronic bacterial prostatitis, representing an overall rate of 8.2%, with the prevalence ranging from 2.2 to 9.7%. A history of sexually transmitted diseases was associated with an increased risk for prostatitis symptoms. Men reporting a history of chronic bacterial prostatitis symptoms had a substantially increased rate of benign prostatic hyperplasia, lower urinary tract symptoms, recurrent UTI and prostate cancer.

Findings supporting our study can also be reflected in the study by Collins et al (18) evaluating the prevalence and correlates of prostatitis symptoms among United States health professionals without prostate cancer. Subjects provided demographic, clinical and lifestyle information; urological diagnoses; and described lower urinary tract symptoms. Of the 31681 participants, 16% had a self-reported history of prostatitis. Participants reporting a history of benign prostatic hyperplasia had a 7.7 fold greater odds of a history of prostatitis, those with severe lower urinary tract symptoms had 2.8-fold greater odds of a history of prostatitis, and

men with moderate lower urinary tract symptoms had a 1.8-fold greater odds of prostatitis.

### Conclusion

The management of recurrent UTI in men remains an interesting subject of research as it is associated with a wide range of multi drug resistant pathogen strains, risk factors as well as associated urogenital complications such as CBP. As such management of men diagnosed with recurrent urinary tract infections involves evaluation and treatment of urogenital tract infections such as CBP. Subsequently, modifications in the management of RUTI have to be made on the basis of associated CBP and the pattern of antimicrobial susceptibility results. It is hoped that findings from this study would be helpful in ensuring effective management of recurrent UTIs and would in turn reduce the associated complications and morbidity. This study also warrants further investigations for better understanding of the public health impact of recurrent UTI associated with CBP and compile the guidelines and recommendations for the prevention of both RUTI as well as CBP.

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