

Comparison of Antibiotics and Symptomatic Treatment for Uncomplicated Urinary Tract Infections

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ABSTRACT

Background: The most frequent bacterial illness among patients who seek primary care is an uncomplicated urinary tract infection (UTI), which is also the leading cause of the rapidly growing strains of bacteria that are resistant to the developing antibiotic sector. The only approach is to employ antibiotics when direly necessary. This study was aimed to evaluate the efficacy of symptomatic therapy with antibiotics in adults with uncomplicated urinary tract infections.

Methodology: This descriptive comparative study was carried out at Medical Unit of DHQ Teaching Hospital, Dera Ismail Khan for the duration from August 2022 to January 2023. A total of 140 adult patients in the age range of 20 to 70 years with urinary tracts infection in the absence of any complication were registered. UTI was confirmed based clinical symptoms of painful and frequent micturition, lower abdominal discomfort and fever supported by urinalysis showing more than 10 white cells/HPF and casts. Patients were arbitrarily assigned to two groups (A and B) in equal number. Patients in Group A received symptomatic management with antipyretics and pain killers while group B received antibiotics for 07 days. Treatment goal was subsidence of symptomatology measured on day 7 after treatment initiation. IBM SPSS version 25 was used for data analysis.

Results: Age of the patients ranged from 20 to 70 years with mean age 31.40 ± 5.411 years in symptomatic group versus 34.16 ± 4.786 years in antibiotic group. Majority of the participants belong to age group 20-40 years in either treatment category. Female participants were more frequently registered in either treatment group. Symptomatic treatment was effective in 39 patients (55.7%) patients while antibiotics were effective in 63 patients (90.0%) patients (p value < 0.001).

Conclusion: Symptomatic treatment is not inferior to antibiotic treatment when proper patient selection is undertaken, resulting in decreased need for unnecessary antibiotics use.

Keywords: Uncomplicated Urinary Tract Infection, Symptomatic Treatment, Antibiotic Treatment

INTRODUCTION

Urinary tract infections (UTIs) are one of the most common infections, with a prevalence of 0.7 percent globally [1]. Reports suggest that UTI leads to more than 7 million medical appointments, 1 million ER visits, and more than 100,000 hospital admissions in the United States every year resulting in major healthcare financial implications. Moreover, it ranks as the second most typical justification for prescribing antibiotics [2]. UTIs typically affect females. Recovery, without any intervention, is often the natural course of the disease [3].

Urinary tract infections may be classified as complicated and uncomplicated. Uncomplicated UTI include infections of the distal (urinary bladder and urethra) and proximal urinary tract (ureters and kidneys) infections [4]. Uncomplicated cases are typically characterized by constellation of symptoms including burning and painful micturition localized to hypogastric compartment when infection is limited to distal tracts. Proximal extension of the infection may lead to symptoms like loin pain and tenderness with fever. [3] Current recommendations advocate for presumptive antibiotics administration as the initial course of therapy for uncomplicated UTIs. An approximated 82% of urinary infections are treated with this approach [5]. However, in the era of antibiotics resistance, a more meticulous and antibiotic restrictive strategy is warranted. One such approach is employment of symptom directed administration of medication rather than empiric antibiotic therapy. Using symptomatic medications, such as paracetamol for fever and pain alleviation. NSAIDs can offer antibacterial cover, albeit the evidence is conflicting [6].

According to Gágyor I et al. [7], antibiotics are better than NSAIDs in relieving symptoms and less often suffer pyelonephritis. In a comparative analysis, Carey MR et al. found that 248 women receiving symptomatic treatment (Ibuprofen) had a greater overall intensity of symptoms and propensity towards proximal urinary infections [8].

UTIs (urinary tract infections) place a heavy financial and patient burden on hospitals' outpatient departments. On a local level, antibiotics and symptomatic therapy have not yet been

contrasted. This study is aimed to compare the effectiveness of conservative symptomatic approach versus antibiotic administration in individuals with uncomplicated urinary tract infections.

METHODOLOGY

Settings: This descriptive comparative study was performed at department of Medicine, DHQ Teaching Hospital, Dera Ismail Khan for the duration from August 2022 to January 2023.

Sampling: 140 participants were recruited through non-probability convenient sampling technique. Study included both male and female patients within age range of 20 to 70 years presenting with uncomplicated urinary tract infection. Uncomplicated urinary tract infection was defined by clinical features including painful urination, frequency and fever. Pain may be mid lower abdominal when infection was confined to distal tracts and flank regions when extended to proximal tracts. Urinalysis was performed to support clinical findings. The cut off for urinary tract infection was set at more than 5 white cells/HPF and presence of white and red cell casts. A dedicated ultrasound abdomen was performed to exclude any anatomical abnormalities. Pregnant and lactating female, immunocompromised, chronic kidney disease or any other chronic co-morbidity were excluded.

Data Collection: After taking approval from the research review committee and ethical board of the hospital, patients diagnosed with uncomplicated UTI were recruited from the outdoor department of the medicine. Informed consent was taken from the participants. Baseline information were gathered which included age, gender, BMI and disease duration. Detailed and focused history was taken about the complaints followed by physical examination. Urinalysis and ultrasound abdomen was performed to support the clinical findings.

Intervention: Patients were arbitrarily assigned to two groups (A and B) in equal number. Participants in group A received conservative symptom directed management which included hydration, oral administration of cranberry juices twice daily and antipyretics (tablet paracetamol 500mg thrice daily) and NSAIDs

(ibuprofen 400mg twice daily after meal) as required for one week. Tablet cefixime 400 mg daily orally was administered to patient in group B for 07 days.

Study End Point: Assessment of response to treatment after 07 days of treatment initiation defined primary end point. Response was assessed in terms of subsidence of symptoms after treatment completion. Both groups were compared for effectiveness.

Data Analysis Procedure: The data was drafted using IBM's SPSS version 24.0 software and statistical analysis was carried out. Means and standard deviations were determined for quantitative variables. Frequencies and percentages were reported for qualitative data. Treatment response was compared in both groups to determine effectiveness. Unpaired t-tests were used to compare continuous variables with a normal distribution between two groups. Using the Mann-Whitney U test, non-normal distribution variables between two groups was compared. Categorical variables were compared using chi square test. A two-sided p value of 0.05 or less was regarded as statistically significant.

RESULTS

Baseline characteristics are reported in table 1. Age of the patients ranged from 20 to 70 years with mean age 31.40 ± 5.411 years in symptomatic group versus 34.16 ± 4.786 years in antibiotic group. Majority of the participants belong to age group 20-40 years in either treatment category. Female participants were more frequently registered in either treatment group. The female to male ratio was 2.07 : 1 and 1.1 : 1 in symptomatic group and antibiotic respectively. Increased urinary frequency and pain lower abdomen were most common presenting complaint. The respective percentages in symptomatic group were increased urinary frequency (64.3%), pain abdomen (50.0%) and fever (14.3%). Observed symptoms in patients with antibiotic group were urinary frequency (67.14%), pain abdomen (47.1%) and fever (18.6%) respectively.

Table 2 reports response to treatment (effectiveness) in both groups. Symptomatic treatment was effective in 39 patients (55.7%) patients while antibiotics were effective in 63 patients (90.0%) patients (p value <0.001).

Table 1: Baseline characteristics of patients

Baseline Characteristics	Mean \pm Standard Deviation	
	Symptomatic Group	Antibiotic Group
Age (years)	31.40 \pm 5.411	34.16 \pm 4.786
Disease Duration (days)	4.51 \pm 1.003	5.02 \pm 1.993
BMI (Kg/m ²)	21.273 \pm 1.071	21.978 \pm 1.390

Table 2: Treatment response (effectiveness) in symptomatic versus antibiotic group

Treatment Response	Symptomatic Group		Antibiotic Group		P value
	Frequency	Percent	Frequency	Percent	
Yes	39	55.7	63	90.0	<0.001
No	31	44.3	07	10.0	
Total	70	100.0	70	100.0	

DISCUSSION

Symptomatic treatment was effective in 39 patients (55.7%) patients with uncomplicated UTI. In contrast, antibiotic treatment was effective in 63 patients (90.0%) patients. The results of this study suggest a tendency of antibiotic towards effectiveness as compared to symptomatic management. However, given the fact that symptomatic management was effective in more than half of the patients assigned to symptomatic group is not negligible. In a previous study by Jamil and colleagues [9], a tendency towards equal effectiveness was reported. These results are in contrast to our findings. Nitrofurantoin (fluoroquinolone) was administered to antibiotic in their while we used cefixime (cephalosporin) in our study. This may have created the difference in the outcomes.

To establish or discard the effect of various antibiotics on the outcomes, we evaluated relevant literature search. In a placebo

controlled randomized trial comprising 78 patients with UTI, Christiaens et al. [10] found that the rates of symptom improvement or at least resolution were observed in about 50% patients in both groups. Contrarily, Ferry et al. [11] compared different antibiotic treatments and a placebo in a significant UTI trial, with somewhat depressing results for the group receiving a placebo (26% symptom resolution after 7 days). Nevertheless, no study in this group included a symptomatic treatment arm for comparison. Little et al. [12] showed that delayed antibiotic prescriptions were associated with prolonged illness duration. Unfortunately, no symptomatic treatment arm was included in any of these investigations.

The fact that this study is founded on clinical symptoms reported by individuals and the outcomes as defined by patient for themselves is a strength. The current demands and suggestions of general practitioners for symptom-focused, therapeutic care without pointless laboratory studies are fairly effectively met by this. The biggest drawback of this study appears to be that the study design. Carefully designed randomized trial would have potentiated its outcomes. It should be highlighted that despite being aware of the risk of overtreatment, physicians may be motivated to prescribe antibiotic treatment for uncomplicated UTI due to worries about the patient's safety or a fear of consequences. The incidence of mild adverse events was found to be comparable in both research groups, and no significant problems were seen in either group.

CONCLUSION

Antibiotics are not superior to symptomatic therapy when given to a specific patient population for the treatment of symptomatic, uncomplicated UTI. The findings of our study point to revised treatment guidelines for the symptomatic management of simple urinary tract infections.

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