



Prevalence and Risk Factors Associated with Urinary Tract Infection Among Women of Reproductive Age Attending JR Hospital and Research Institute, Manipur

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ABSTRACT

Urinary tract infection (UTI) is one of the most common bacterial infections affecting women of reproductive age. The main source of the microorganisms is an individual's own faecal flora, vagina and perineal area. The causative organisms are normally present in the cell lining of the urinary tract and gastrointestinal tract, with *Escherichia coli* being the most common pathogen (80-85%).

The present study aimed to determine the prevalence of urinary tract infection (UTI) and associated risk factors among women aged 18-45 years attending JR Hospital and Research Institute, Manipur. A cross-sectional study was conducted using 200 midstream urine samples collected from female patients. Standard microbiological techniques were used for isolation and identification of uropathogens. Each participant completed a structured questionnaire on dietary habits, personal hygiene, water intake, sexual activity and awareness of UTI. The overall prevalence of UTI was found to be 30%. Frequent sexual activity ($p = 0.027$), urinary symptoms ($p = 0.001$) and lack of awareness ($p = 0.012$) showed significant association with UTI. The findings highlight the importance of awareness, early diagnosis and preventive measures to reduce UTI among women of reproductive age.

Keywords: Urinary tract infection, prevalence, reproductive age, women, risk factors.

INTRODUCTION

Urinary tract infection is the leading cause of morbidity and health care expenditures in persons of all the ages. Symptoms of urinary tract infection include frequent feeling or need to urinate, pain during urination, fever, pelvic pain, and cloudy urine (Anderson, 1983). Poor hygiene practices and contamination from intestinal flora are important contributors to UTI. *E. coli* (80-85%) which is normally present in the cell lining of the urinary tract and gastrointestinal tract is the commonest causative organism (Bagga et al., 2003).

Other gram-negative colonic bacteria have been gaining prominence in India over the last two decades (Acharya and Jadan, 1980). The long-range consequences of ignoring urinary tract infection can lead to kidney failure, septicemia, bacterial endocarditis, prostatitis, and infertility (Chung et al., 2010). Approximately, 60% of all women experience at least one UTI within their lifetime and roughly 20–30% of women suffer from repeated infections (Drakshayani Devi and Venkata Ramaiah, 1994).

In post-menopausal women, UTI risk factors may also comprise urinary incontinence. Bacterial virulence properties may affect the risk of recurrence of infection as well. UTI is commonly caused by *Escherichia coli*, *Proteus*, *Klebsiella*, *Enterococcus*, and *Enterobacter* spp. (Efstratios demetriou et al., 1982)



In recent years, an increased number of Extended-Spectrum-Beta-Lactamases (ESBL) producing pathogens have been observed in outpatient settings, especially related to urinary tract infections (UTI), narrowing the treatment option with antibiotics (Gonzalez and Schaeffer, 1999)

MATERIALS AND METHODS

Population and Sample of the Study

The study population comprised 200 specimens collected from JR Hospital and Research Institute, Manipur. Freshly voided midstream urine samples (10-20 ml) were collected from patients using wide-mouth sterile container.

Sampling Technique Used

A convenience sampling technique was used to select the study participants.

Analysis of Specimen

Urine samples were collected from individuals after obtaining informed consent. Participants were requested to complete a questionnaire regarding their medical history, morbidity and recent medication use. Subjects who were receiving antimicrobial treatment for existing conditions were excluded from the study. One midstream-urine sample per female subject was collected and examined by standard quantitative culture methods. A positive culture was defined as the growth of a single microorganism at a concentration of $>10^5$ colony-forming units (CFU) /ml. In cases where there was a delay in processing, the samples were stored at 4°C.

Inclusion Criteria

4. Females of reproductive age group (18 -45 years).
5. Cases who are willing to participate in the study.

Exclusion Criteria

- Patients who are already on medication therapy.
- Patients on menstruation period.
- Patients who have history of known urinary tract anomalies.
- Patients who are not interested to participate.

Identification of the Uropathogens

The urine specimens obtained were inoculated on Cystine-Lactose-Electrolyte-Deficient Agar (CLED) agar and MacConkey agar using a calibrated loop (0.001/ml). Cultures were incubated under aerobic conditions at 37°C for 24 hours. A positive urine culture was defined as colony count of $>10^5$ cfu/ml for midstream urine samples. All positive cultures showing significant bacteriuria were further identified based on their colony characteristics, gram-staining reaction, and biochemical test profiles using the standard microbiological techniques. A standardized, structured questionnaire was used in the study. The questionnaire included the socio-demographic details, such as age, dietary habits, personal hygiene, clinical symptoms, sexual activity and patients' awareness of urinary tract infection.

Data Analysis

All the data collected were entered into the Microsoft Excel and analysis was carried out using SPSS, version 25. The prevalence of UTI was calculated using percentage. Statistical significance (chi square test and p-



value) and odds ratio (OR) with 95% confidence intervals (CI) were calculated to assess the strength of association.

A p-value <0.05 was considered statistically significant.

Table 1: Distribution of UTI cases between the age group 18-45 years (JR Hospital & Research Institute) (n= 200): (Shahni and Huidrom, 2025).

S. No	Age groups	No. of cases	Positive cases	Negative cases	Prevalence (%)
1	18- 26	60	18	42	30
2	27- 35	74	22	52	29.7
3	36-45	66	20	46	30.3
		Total 200	60	140	30

Table 2: Distribution of UTI according to dietary habit (n= 200)

Variable	Urinary tract infection				Odds Ratio (95% CI)	Chi-square	p-value
Dietary habit	UTI Positive (n)	%	UTI Negative (n)	%	0.59 (0.32-1.12)	2.64	0.104
Proper	20	23.8	64	76.2			
Improper	40	34.5	76	65.5			
Total	60	30.0	140	70.0			

Table 3: Distribution of UTI according to personal hygiene (n= 200).

Variable	Urinary tract infection				Odds Ratio (95% CI)	Chi-square	p-value
Time you bath everyday	UTI Positive (n)	%	UTI Negative (n)	%	0.86 (0.47-1.57)	0.25	0.619
Yes	32	28.6	80	71.4			
No	28	31.8	60	68.2			
Total	60	30.0	140	70.0			
Use of vaginal douching							
Yes	25	34.7	47	65.3	1.41 (0.76-2.63)	1.19	0.274
No	35	27.3	72	36			
Total	60	30.0	140	70.0			
Change of							



undergarment frequency more than once								
Yes	20	25.0	60	75.0	0.67 (0.35-1.25)	1.59	0.208	
No	40	33.3	80	66.7				
Total	60	30.0	140	70.0				

Table 4: Distribution of UTI according to clinical symptoms (n=200):

Variable	Urinary tract infection				Odds Ratio (95% CI)	Chi-square	p-value
Water consumption/ Water intake	UTI Positive (n)	%	UTI Negative (n)	%			
Yes	12	21.4	44	78.6	1.83 (0.90-3.73)	3.01	0.083
no	48	33.3	96	66.7			
Total	60	30.0	140	70.0			
Urinary tract infection symptoms at present							
No	25	20.8	95	79.2	2.96 (1.59-5.51)	11.76	0.001
Yes	35	43.8	45	56.2			
Total	60	30.0	140	70.0			
Difficulty while urinating							
No	20	20.8	76	79.2	2.38 (1.27-4.47)	7.39	0.007
Yes	40	38.5	64	61.5			
Total	60	30.0	140	70.0			

Table 5: Distribution of UTI according to Sexual activity (n=200):

Variable	Urinary tract infection				Odds Ratio (95% CI)	Chi-square	p-value
	UTI Positive(n)	%	UTI Negative(n)	%			
Using spermicides					1.81 (0.98-3.36)	3.58	0.058
Yes	25	24.0	79	76.0			



No	35	36.5	61	63.5			
Frequent intercourse							
Yes	12	50.0	12	50	2.67 (1.2- 6.34)	4.88	0.027
No	48	27.3	128	72.7			
Total	60	30.0	140	70.0			

Table 6: Distribution of UTI according to patients' awareness of urinary tract infection (n= 200).

Variable	Urinary tract infection				Odds Ratio (95% CI)	Chi-square	p-value
Patients' awareness of UTI	UTI Positive (n)	%	UTI Negative (n)	%			
Yes	25	22.7	85	77.3	2.16 (1.18-3.96)	6.33	0.012
No	35	38.9	55	61.1			
Total	60	30.0	140	70.0			

RESULTS

Sixty (60) bacterial species were isolated and identified following their morphological and biochemical characterization (Shahni and Huidrom, 2025).

A total of 200 women of reproductive age were included in the study (18-45 years). This distribution of UTIs based on demographic data were analyzed using a structured questionnaire containing specific questions related to daily activities that may be associated with urinary tract infections.

Distribution of UTI Cases Between the Age Group 18 - 45 years

Table 1 shows the distribution of UTI according to a number of demographic factors, including age. The highest prevalence was observed among women aged 36 - 45 years (30.3%), followed by women aged 18 – 26 years (30.0%) and 27- 35 years (29.7%). The prevalence was relatively similar across all age groups (Shahni and Huidrom, 2025).

Relationship Between UTI and Sociodemographic Characteristics

The statistical relationship between various socio-demographic characteristics is seen in table 2 which presented the association between dietary habits and UTI prevalence. Women with improper dietary habits showed a higher prevalence of UTI (34.5%) compared with women with proper dietary habits (23.8%). The odds of UTI were lower among women with proper dietary habits (Odds Ratio = 0.59, 95% CI :0.32 -1.12). However, the association was not statistically significant ($\chi^2 = 2.64$, $p = 0.104$).

Table 3 presented the relationship between personal hygiene practices and UTI prevalence. Women who did not bathe daily had higher chances of UTI as compared with those who bathed daily (OR = 0.86, 95% CI: 0.47- 1.57), but the association was not statistically significant ($\chi^2 = 0.25$, $p = 0.619$). Women practicing vaginal douching had 1.41 times higher odds of UTI compared with those who did not (OR = 1.41, 95% CI: 0.76 – 2.63), although the association was not statistically significant ($\chi^2 = 1.19$, $p = 0.274$). Similarly,

undergarment changing frequency was not significantly associated with UTI prevalence (OR= 0.67, 95% CI: 0.35-1.25; $\chi^2 = 1.59$, $p = 0.208$).

Table 4 demonstrated the association between clinical symptoms and UTI prevalence. Women with low water intake had 1.83 times higher odds of UTI compared with women who consumed adequate water (OR= 1.83, 95% CI: 0.90- 3.73). However, the association was not statistically significant ($\chi^2 = 3.01$, $p = 0.083$). Women reporting urinary symptoms had significantly increased odds of UTI (OR= 2.96, 95% CI: 1.59- 5.51), and the association was statistically significant ($\chi^2 = 11.76$, $p = 0.001$). Likewise, women experiencing difficulty while urinating had significantly higher odds of UTI (OR = 2.38, 95% CI: 1.27- 4.47), with a significant association ($\chi^2 = 7.39$, $p = 0.007$).

Table 5 showed the association between sexual activity and UTI prevalence. Women who did not use spermicides had higher odds of UTI than those who used spermicides (OR= 1.18, 95% CI: 0.98 – 3.36), although the association was not statistically significant ($\chi^2 = 3.58$, $p = 0.058$). Frequent sexual intercourse was significantly associated with UTI prevalence (OR= 2.67, 95% CI: 1.12 -6.34; $\chi^2 = 4.88$, $p = 0.027$).

Table 6 presented the association between awareness and UTI prevalence. Women who were not aware of UTI had significantly higher odds of infection than women who were aware of it (OR= 2.16, 95% CI :1.18 -3.96; $\chi^2 = 6.33$, $p = 0.012$).

DISCUSSIONS

The present study assessed the prevalence of urinary tract infection (UTI) and its associated risk factors among women of reproductive age. The overall prevalence of UTI was found to be 30.0%, indicating that UTI remains a common health problem in this population. In comparison, Subhashini et al. reported a prevalence of 84%, while Kolawole et al., documented a prevalence of 60% and Shaifali et al., reported a prevalence of 44.53%.

The variation in prevalence rates observed between the present study and previous studies may be attributed to differences in several factors, despite all studies being conducted in hospital settings. These factors may include differences in sample size, demographic characteristics of the study population, socioeconomic status, personal hygiene practices, geographical location, healthcare-seeking behavior, diagnostic methods used for urine analysis, and inclusion or exclusion criteria adopted in the studies. In addition, variations in antimicrobial usage, environmental conditions and awareness regarding UTI prevention may also contribute to the observed differences in prevalence rates.

Age wise distribution showed that women aged 36-45 years had a slightly higher prevalence of UTI compared with other age groups. However, the prevalence was relatively similar across all reproductive age groups, suggesting that women remain susceptible to UTI throughout their reproductive years.

Women with improper dietary habits showed a higher prevalence of UTI compared with those who maintained proper dietary habits. Although the odds ratio suggested an increased risk, the association was not statistically significant ($p = 0.104$). This finding indicates that dietary habits alone may not be a major determinant of UTI occurrence in the study population.

Regarding personal hygiene practices, women who practiced vaginal douching and those who changed undergarments less frequently demonstrated higher prevalence rates of UTI. However, these associations were not statistically significant. The lack of statistical significance may be due to the limited sample size or the influence of other confounding factors. Nevertheless, maintaining good personal hygiene remains important for preventing urinary tract infections.

Water intake was also examined as a potential risk factor. Women with lower water consumption had higher odds of UTI compared with women who consumed adequate amounts of water. Although the association was not statistically significant ($p = 0.083$), adequate hydration is known to promote urinary flow and facilitate the elimination of bacteria from the urinary tract.

The presence of urinary symptoms was strongly associated with UTI prevalence. Women reporting symptoms suggestive of urinary tract infection were nearly three times more likely to develop UTI compared with asymptomatic women. This association was statistically significant (OR = 2.96; 95% CI: 1.59- 5.51; $p = 0.001$). This finding is consistent with the clinical manifestations of urinary tract infections.

Similarly, difficulty during urination was significantly associated with UTI prevalence. Women experiencing difficulty during urination had more than two times higher odds of infection compared with those without such symptoms (OR= 2.38; 95% CI :1.27 – 4.47; $p = 0.007$). Dysuria is a common symptom of UTI and may serve as an important indicator for early diagnosis.

Sexual activity was another factor associated with UTI prevalence. Frequent sexual intercourse showed a statistically significant association with infection ($p = 0.027$). Sexual activity may facilitate the introduction of microorganisms into the urinary tract and increase the likelihood of infection.

Awareness regarding urinary tract infection and its treatment demonstrated a significant protective effect. Women who lacked awareness about UTI had significantly higher odds of infection than those who were aware (OR = 2.16; 95% CI: 1.18 – 3.96; $p = 0.012$). These findings highlight the importance of health education and awareness programs in reducing the burden of urinary tract infections among women.

Overall, the study findings suggest that urinary symptoms, difficulty during urination, frequent sexual intercourse and lack of awareness regarding UTI are important factors associated with urinary tract infections among women of reproductive age.

CONCLUSION

The study demonstrated that the prevalence was significant among women of reproductive age. A significant association was found between UTI prevalence and factors such as frequent sexual intercourse, difficulty during urination and lack of awareness. This highlights the need for increased health education, hygiene promotion, early screening and knowledge about urinary tract infection may help in prevention, management and reduce disease burden.

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Ethical Approval:

The study was approved by the Institutional Ethical Committee.

Informed consent was obtained from each participant.

REFERENCES

1. Anderson JE., (1983). Seasonality of symptomatic bacterial urinary infections in women. *J Epidemiol Community Health*, 37(4): 286-90.
2. Bagga A, Tripathi P, Jatana V, Hari P, Kapil A, Srivastava RN, et al., (2003). Bacteriuria and urinary tract infections in malnourished children. *Pediatr Nephrol*, Apr; 18(4): 366-70.
3. Chung A, Arianayagam M, Rashid P., (2010). Bacterial cystitis in women. *Australian Family Physician*, 39(5): 295-8.
4. Drakshayani Devi K, Venkata Ramaiah P., (1994). A study on menstrual hygiene among rural adolescent girls. *Indian J Med Sci*, June; 48(6): 139-43.
5. Efstratios demetriou, S Jean Emans, Robert P., (1982). Masland Jr. Dysuria in Adolescent Girls: Urinary Tract Infection or Vaginitis. *Pediatrics*, 70(2): 299-301.



6. Gonzalez CM, Schaeffer AJ., (1999). Treatment of urinary tract infection: what's old, what's new, and what works. *World J Urol.*; 17: 372–82.
7. Shahni S. and Huidrom P., (2025). Isolation and characterization of pathogenic bacteria causing urinary tract infection (UTI) in symptomatic female of reproductive age. *Indian Journal of Applied Research*, 15(04),2249- 555X.
8. Subhashini N, Joby J, Latha A, Indira A. (2016) Assess the prevalence of urinary tract infection among patients admitted in tertiary care hospital at Nellore. *Indian J Applied Res.*;2(6):865-6.
9. Kolawole AS, Kolawole OM, Kandaki-Olukemi YT, Babatunde SK, Durowade KA, Kolawole CF. (2010). Prevalence of urinary tract infections (UTI) among patients attending Dalhatu Araf Specialist Hospital, Lafia, Nasarawa state, Nigeria. *Int J Med Sci.*;1(5):163-7.
10. Shaifali I, Gupta U, Mahmood SE, Ahmed J. (2012) Antibiotic susceptibility patterns of urinary pathogens in female outpatients. *North Am J Med Sci.*;4(4):163.