

Prevalence of Uncomplicated Recurrent Urinary Tract Infection among Adult Females in Babylon Governorate

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Abstract

Background: Urinary tract infections (UTIs) are among the most frequent infections in clinical practice. They are classified into uncomplicated UTIs and complicated UTIs. The majority of UTI cases are caused by a single bacterial agent. Diagnosis of UTIs is generally established based on urinalysis and urine culture and treated with appropriate antibiotics. **Objectives:** The aim of this study was to determine the prevalence and characteristics of uncomplicated recurrent UTI among adult females. **Materials and Methods:** This study is a cross-sectional study conducted in the outpatient clinics of Al-Hilla Teaching Hospital and Babil Hospital for Maternity and Childhood during the period from February till June 2020. Data were collected using a specially designed questionnaire, and a total of 300 participants were included. **Results:** The overall prevalence of uncomplicated UTI was found to be 36%. The mean age of patients was 28.94 ± 7.42 years. Ninety percent of the patients were married. The proportion of recurrent UTI among married women was significantly higher than that among nonmarried women ($P = 0.001$), and recurrent UTI was significantly higher among women with family history of UTI ($P < 0.001$). **Conclusions:** This study concludes that the prevalence of uncomplicated UTI among adult females in Babylon governorate is 36%, with the majority of cases within the age group of 20–29 years. Recurrent UTI was found to be linked to marital status and positive family history.

Keywords: Female, prevalence, recurrent urinary tract infection

INTRODUCTION

Urinary tract infections (UTI) are among the most frequent infections in clinical practice. They comprise a wide variety of infections ranging from simple cystitis to uroseptic shock and require a considerable amount of antibiotics for their management.^[1]

UTIs are generally classified as either health-care-associated UTIs or community-associated UTIs (CAUTIs). They can also be classified according to the location of the infection into cystitis, pyelonephritis, and urosepsis.^[2]

The European Association of Urology had classified urological infections according to the status of complication into: (1) uncomplicated UTIs (low risk) including cystitis, pyelonephritis, and recurrent UTIs and (2) complicated UTIs (high risk) including cystitis, pyelonephritis, recurrent UTIs, catheter-associated UTI, UTI in males, and urosepsis.^[3]

Uncomplicated UTIs are generally seen in noncatheterized patients with no functional or anatomical abnormalities of their genitourinary systems, whereas complicated UTIs

are generally observed in patients with functional and/or anatomical abnormalities or with diseases that affect the body defense mechanism.^[3,4]

Risk factors for CAUTIs include age, previous history of UTI, sexual activity, and diabetes mellitus (Vincent *et al.*, 2013). Female patients within the age group of 36–65 years have additional risk factors including bladder prolapse and gynecological surgeries. Male patients within the same age group have other risk factors that include prostatic hypertrophy or prostatic obstruction, catheterization, and surgical intervention. Older patients of both sexes have furthermore risk factors that include chronic use of urinary catheters and incontinence.^[5]

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The majority of UTI cases are caused by a single bacterial agent. For instance, more than 80% of cases with uncomplicated cystitis and pyelonephritis are caused by *Escherichia coli*. Other bacterial species that are less commonly found in UTI cases are *Klebsiella*, *Proteus*, and *Enterobacter* species.^[6]

Symptoms of uncomplicated UTI generally include dysuria, suprapubic pain and/or tenderness, urgency, and frequency. However, some cases are identified as having asymptomatic bacteriuria, which is a condition characterized by the presence of bacteria in urine with a quantity of >100,000 colony-forming units per milliliter in one urine specimen (males) or two consecutive specimens (females), with the distinctive absence of urinary symptoms. These conditions require an accurate diagnosis in order to use the appropriate antibiotics required for the management.^[7]

Diagnosis of UTIs is generally established based on urinalysis and urine culture. Urine is usually obtained from voided specimens, but some cases require aspiration of urine from the suprapubic area, which aids in reducing contamination from vaginal and perirectal areas. However, this aspiration method is rarely used due to its invasiveness. Obtaining urine from the urinary catheter is a less invasive method that still reduces the risk of contamination of the urine specimen, making it a practical method in clinical practice.^[8] Management of UTIs is done with appropriate antibiotics, the choice of which depends primarily on the results of urine culture, which should be done before the initiation of antibiotic therapy. However, if empirical antibiotic treatment is given immediately after taking the specimen for culture, the choice of antibiotic should be re-evaluated after completion of the urine culture results.^[9,10]

The aim of this study was to determine the prevalence of uncomplicated recurrent UTI among adult females and to determine the characteristics of uncomplicated recurrent UTI among adult females.

MATERIALS AND METHODS

Study design and patients

This study is a cross-sectional study conducted in the outpatient clinics of Al-Hilla Teaching Hospital and Babil Hospital for Maternity and Childhood, Babylon province, Iraq, during the period from February 2020 till June 2020 to assess the prevalence of UTI among female patients.

The study included a total of 300 female patients aged between 18 and 50 years who attended the outpatient clinics of the aforementioned hospitals.

Inclusion and exclusion criteria

Inclusion criteria include female patients aged 18–50 years who attended the outpatient clinics with no exclusion criteria. Exclusion criteria included:

1. Patients with complicated UTI, including:
 - Anatomic abnormalities
 - Iatrogenic urinary tract injuries
 - Voiding dysfunction

- Urinary tract obstruction
- Urolithiasis
- Disorders associated with immunosuppression including diabetes mellitus.

2. Pregnancy

3. Patients who refused to participate in the study.

Data were collected using a specially designed questionnaire that included sociodemographic characteristics, details about UTIs as well as past medical and surgical history. Family history was also inquired. Detailed history of the present illness was obtained, followed by clinical examination. This study was approved by the Scientific Committee of Family and Community Medicine Department in Babylon University – College of Medicine. Verbal consent was obtained from each participant before data collection. All obtained data were handled with privacy and confidentiality.

Statistical analysis

SPSS software version 23.0 (SPSS, IBM Company, Chicago, IL 60606, USA) was used to perform statistical analysis for this study. Continuous variables were represented as means $\pm$ standard deviation, while categorical variables were represented as frequencies and percentages. Student's *t*-test was used to compare means between two groups, while Chi-square test was used to assess the relationship between categorical variables. $P \leq 0.05$ was considered statistically significant.

Ethical consideration

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients' verbal and analytical approval before the sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee.

RESULTS

This study included a total of 300 females. Among those females, 108 of them had been diagnosed with UTI, thereby giving an overall prevalence of (36.0%) [Figure 1].

The age of patients with UTI ranged from 18 to 50 years, with a mean age of 28.94 ± 7.42 years. Figure 2 illustrates the age group distribution among study patients.

Majority of female patients complaining of uncomplicated UTI were married, constituting (89.81%) of the total number of UTI patients in the present study [Table 1].

Recurrent UTI was reported by more than three-quarters of the patients (82.41%). The majority of them had recurrent UTI three or more times. The proportion of recurrent UTI among married women was significantly higher than that among nonmarried women, with $P = 0.001$ [Table 2]. The odds ratio for married women to have recurrent UTI is 7.75, with 95% confidence interval of 2.07–29.11. This means that married women are approximately 8 times more likely to have recurrent UTI compared to nonmarried women.

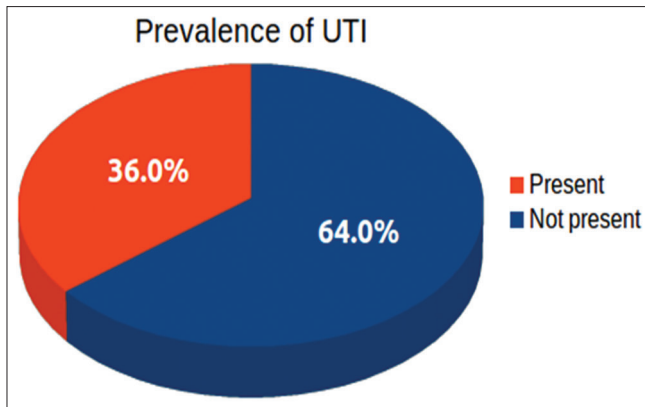


Figure 1: Prevalence of urinary tract infections among study participants

Family history of UTI was positive in about one-third of the cases (35.19%), and there was a highly significant relationship between recurrent UTI and positive family history, $P < 0.001$ [Table 3].

Regarding husbands of married patients, 34.48% of them had also complained of UTI. However, no statistically significant relationship was observed between the presence of UTI among husbands and recurrent UTI among married females, $P = 0.759$ [Table 4].

Symptoms were reported by almost all the patients (99.07%), with the most common symptom being dysuria. Other symptoms included lower abdominal pain, fever, frequent urination, and abnormal discoloration of urine. General urine examination was performed in (94.44%) of patients, while blood culture was performed only in 15.74% of the patients.

DISCUSSION

This study had demonstrated that the prevalence of uncomplicated UTI among females in Babylon governorate aged 18–50 years is 36%. This finding is slightly higher than the prevalence of 29% reported by Ali *et al.* in their study conducted in Kirkuk city in 2007.^[11]

Another recent study in Babylon governorate conducted by Al-Mamoryi and Al-Salman in 2018 had revealed a higher prevalence of UTI among pregnant females, reaching almost two-thirds of the patients (64.6%),^[12] with a similar prevalence of (66%) reported in Al-Muthana governorate by Kadhimi in 2013.^[13]

However, this variation observed between the present study and the aforementioned studies could be attributed to the fact that each of those studies had included pregnant females, whereas the present study excluded pregnant females, which suggests that the prevalence of UTI is generally higher among pregnant women compared to nonpregnant women. This is supported by the finding reported by Almukhtar in her study conducted in Al-Mosul in 2017, which observed an overall prevalence of 27.3% among women aged (18-40) years, whereas the same study reported a prevalence of 43% among

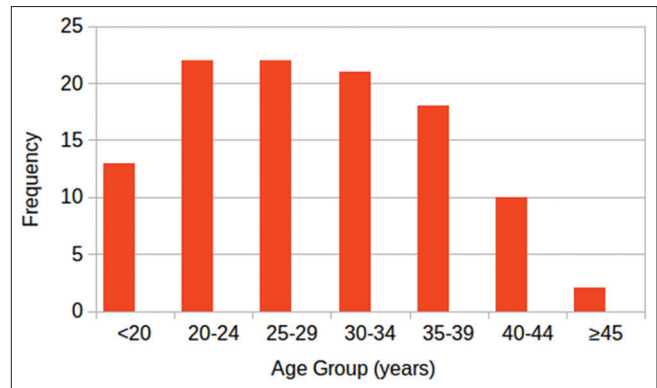


Figure 2: Age group distribution among study patients

Table 1: Marital status of study patients

Marital status	Frequency (%)
Married	97 (89.81)
Single	10 (9.26)
Widow	1 (0.93)

Table 2: Recurrent urinary tract infection among study patients by marital status

Married	Recurrent UTI		Total	P
	Yes	No		
Yes	84 (86.60)	13 (13.40)	97 (100)	0.001*
No	5 (45.45)	6 (54.55)	11 (100)	
Total	89 (82.41)	19 (17.59)	108 (100)	

OR: 7.75 (95% CI 2.07-29.11). *Significant at $P < 0.05$. OR: Odds ratio, CI: Confidence interval, UTI: Urinary tract infection

Table 3: Recurrent urinary tract infection among study patients by family history

Family history	Recurrent UTI		Total	P
	Yes	No		
Positive	38 (100)	0	38 (100)	<0.001*
Negative	51 (72.86)	19 (27.14)	70 (100)	
Total	89 (82.41)	19 (17.59)	108 (100)	

Fisher's exact $P < 0.001$. *Significant at $P < 0.05$. UTI: Urinary tract infection

Table 4: Recurrent urinary tract infection among study patients by husband urinary tract infection

Husband has UTI	Recurrent UTI		Total	P
	Yes	No		
Yes	29 (85.29)	5 (14.71)	34 (100)	0.759
No	56 (87.50)	8 (12.50)	64 (100)	
Total	89 (82.41)	19 (17.59)	108 (100)	

UTI: Urinary tract infection

pregnant women, and concluded that the prevalence of UTI was higher among pregnant women compared to nonpregnant women.^[14]

In the present study, the highest proportion of patients was within the age groups of 20–24 years and 25–29 years, with the two groups forming more than (40%) combined. This finding was similar to the finding reported by Almkhtar in which the age group with the highest occurrence of UTI was 21–30 years, with a proportion of 41.5%.^[14] The majority of female patients in the present study who had UTI were married, forming approximately (90%) of the total patients with UTI. This finding is consistent with the finding by Almkhtar who reported that married female patients constituted 76.4% of total patients with UTI (Almkhtar, 2018). In addition, the recent study by Alsamarai *et al.* in Kirkuk city had demonstrated that certain bacterial species were predominantly isolated from married female patients rather than single patients.^[15]

Recurrent UTI was reported in more than three-quarters of the cases. There was a significant correlation between recurrence of UTI and marital status. Results revealed that 86% of married women had recurrent UTI, while 45% of unmarried women had recurrent UTI. This is consistent with the study by Mohsin and Siddiqui in 2010 and the study by Al-Badr and Al-Shaikh in 2013, who reported that one of the greatest risk factors for recurrent UTI was having frequent sexual intercourse.^[16,17] The present study had demonstrated an odds ratio of 7.75 for married women to get recurrent UTI compared to nonmarried women (95% CI: 20.7–29.11). This finding reflects that married women are 8 times more likely than nonmarried women to develop recurrent UTI. Foxman *et al.* in their study had concluded that the risk of second UTI is confirmed to be highly influenced by the sexual behavior of the patient.^[18]

Family history of UTI was found to be significantly associated with recurrent UTI among patients included in the present study. This finding is supported by the finding by Scholes *et al.* in their case-control study conducted in the United States of America which included a total of 229 female patients and reported that family history of UTI was significantly linked to recurrent UTI, with an odds ratio of 2.3 (95% CI: 1.5–3.7). They reported that family history was the second nonmodifiable risk factor for recurrent UTI.^[19] However, no statistically significant relationship was observed between having recurrent UTI and having UTI by the husband.

CONCLUSIONS

This study concludes that the prevalence of uncomplicated UTI among adult females in Babylon governorate is 36%,

with the majority of cases within the age group of 20–29 years. Recurrent UTI was found to be linked to marital status and positive family history.

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Conflicts of interest

There are no conflicts of interest.

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