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FREQUENCY AND PERINATAL OUTCOME OF UTI IN PREGNANT WOMEN COMING TO A TERTIARY CARE HOSPITAL LAHORE

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Abstract

Objective: *To determine the frequency and perinatal outcome of lower urinary tract infection in pregnant women coming to a tertiary care hospital.*

Study Design: *Descriptive Case Series.*

Study Setting: *This study was conducted at the Department of Obstetrics and Gynecology, Sharif Medical City Hospital, Lahore,*

Study Duration: *Six Months (Dec 2024 to May, 2025).*

Methodology: *A total of 100 pregnant women were enrolled, aged 18–35 years, of any parity, with a gestational age between 24 weeks and less than 37 weeks, presenting for routine antenatal care were included. Lower urinary tract infection was recorded. Perinatal outcomes included preterm labour and low birth weight. Relevant clinical history was recorded, and all participants were evaluated for lower urinary tract infection according to the operational definition. Patients were followed until delivery to document perinatal outcomes.*

Results: *The majority of women belonged to the 26–35 years age group (70%), the frequency of urinary tract infection and perinatal outcomes among the study population. It was diagnosed in 25% of pregnant women. Preterm labour was observed in 22% of cases, low birth weight infants were noted in 25% of pregnancies.*

Conclusion: *Lower urinary tract infection is a common condition during pregnancy and is significantly associated with adverse perinatal outcomes, particularly preterm labour and low birth weight.*

INTRODUCTION

Urinary tract infection (UTI) is considered to be a major problem in pregnant women. It is also one of the most prevalent infections during pregnancy, being diagnosed in as many as 50–60% of all gestations.[1] The high prevalence is influenced by various factors, such as limited access to healthcare services, poor hygiene, low socioeconomic status, and inadequate knowledge regarding UTIs and their prevention.[2-3]

UTIs can be classified as lower urinary tract infections, including both asymptomatic bacteriuria (ASB) or acute cystitis (AC), and upper urinary tract infections or acute pyelonephritis (APN). Most infections are caused by Enterobacteriaceae, commonly found in the gastrointestinal tract, with

Escherichia coli (E. coli) being responsible for 80–90% of cases. However, other bacterias such as Group-B Streptococcus saprophyticus (GBSS), Klebsiella pneumoniae, coagulase-negative Staphylococcus, Staphylococcus aureus and Proteus mirabilis can be found in a lower percentage. [4]

During pregnancy, anatomical and physiological changes in the urinary tract increase susceptibility to UTIs. Ureteral dilatation occurs due to uterine pressure, and progesterone-induced smooth muscle relaxation leads to urinary stasis and vesicoureteral reflux. [5] A prior study reveals that the key risk factors for UTIs included a history of UTI (25.00%), diabetes mellitus (12.50%), frequent sexual activity (33.33%), a history of urinary tract abnormalities (8.33%), urinary catheter usage (4.17%), and recent antibiotic use (20.83%). The primary causative agent identified was Escherichia coli (60.00%). [6]

A study done by Getaneh T, Negesse A, calculated prevalence of UTI in pregnant women as 15.37%.[7] Another study reported this incidence as 32% which is significantly higher than the previous study done by Shaheen HM. [8] Association of maternal lower urinary tract infection with adverse fetal outcome in terms of preterm labor and low birth weight is recorded as 30.3% (47/155) and 24.5% (38/155) respectively. [9] Whereas another study revealed a significant different magnitude i.e. 19.1% for preterm labour. [10] One more study showed a very higher rate of preterm labour in UTI pregnant women i.e. 62%. [11]

The rationale behind my study stems from the observation that, while numerous studies have investigated the prevalence of urinary tract infections (UTIs) in pregnant women and their outcome, there exists a notable disparity in the collected data. This inconsistency in findings emphasizes the need for a fresh and more comprehensive dataset that can better inform the management of UTIs in pregnant women and, consequently, improve our understanding of the outcomes associated with this health concern. Our research endeavors to bridge this gap by providing obstetricians with updated, population-based data. This data will serve as a valuable resource, enabling healthcare professionals to make well-informed decisions when addressing UTIs in pregnant women.

METHODOLOGY:

This descriptive case series was conducted at the Department of Obstetrics and Gynaecology, Sharif Medical City Hospital, Lahore, over a period of six months following approval from the institutional ethical review committee. A total of 100 pregnant women were enrolled using a non-probability consecutive sampling technique. Pregnant women aged 18–35 years, of any parity, with a gestational age between 24 weeks and less than 37 weeks, presenting for routine antenatal care were included. Women already receiving treatment for urinary tract infection and those diagnosed with upper urinary tract infection on ultrasound or renal function tests were excluded.

Lower urinary tract infection was defined as the presence of a urinary pathogen with a urine culture showing more than 100,000 colony-forming units per milliliter. Perinatal outcomes included preterm labour and low birth weight. Preterm labour was defined as delivery before 37 completed weeks of gestation, determined by last menstrual period or first-trimester ultrasound, while low birth weight was defined as neonatal birth weight less than 2500 grams.

After obtaining informed written consent, participants were enrolled from the obstetric outpatient department. Relevant clinical history was recorded, and all participants were evaluated for lower urinary tract infection according to the operational definition. Patients were followed until delivery to document perinatal outcomes. Data were recorded on a predesigned proforma by the principal investigator.

Data analysis was performed using SPSS version 23.0. Quantitative variables were expressed as mean ± standard deviation, while qualitative variables were presented as frequencies and percentages. Stratification was done for maternal age, gestational age at admission, parity, and prior history of urinary tract infection to control for effect modifiers. Associations were assessed using the chi-square test, and a p-value <0.05 was considered statistically significant.

RESULTS:

Table 1 presents a summary of the baseline factors of the study participants (n = 100). Most of the women

were between 26-35 years old (70%), and 30% were between the age of 18 to 25. In the case of the gestational age of presentation, 40 percent of the participants were in the 29-32 weeks range, with 30 percent in the 24-28 weeks range, and 33-34 weeks range. Regarding the parity, 60 percent of females were multigravidas and 40 percent were primigravidas. Fifteen percent of the participants had a history of urinary tract infection previously whereas 85% had no history of the same.

Table 2 shows frequency of urinary tract infection and perinatal outcomes of the study population. In pregnant women, 25 percent of the urinary tract infection was diagnosed and 75 percent showed no instance of infection. It was noted that 22% preterm labour was witnessed and 78 percent was term. The rates of low birth weight infants were found to be 25 percent and 75 percent were normal birth weight babies.

The relationship between urinary tract infection and maternal and perinatal factors is indicated in Table 3. The association between UTI and maternal age group (p = 0.450), gestational age group (p = 0.895), parity (p = 0.157) or previous history of UTI (p = 0.258) was not statistically significant. Nonetheless, the preterm labour rate was higher in women with UTI (36.0%) than in women without UTI (17.3) and this showed a marginal statistical value (p = 0.051). Likewise, the UTI group had low birth weights more often (32.0) than the non-UTI group (22.7) but this was not statistically significant (p = 0.351).

TABLE 1: BASELINE CHARACTERISTICS OF STUDY PARTICIPANTS (N = 100)

Variable	Category	n	%
Maternal age group	18–25 years	30	30.0
	26–35 years	70	70.0
Gestational age group	24–28 weeks	30	30.0
	29–32 weeks	40	40.0
	33–34 weeks	30	30.0
Parity	Primigravida	40	40.0
	Multigravida	60	60.0
Previous UTI	Yes	15	15.0
	No	85	85.0

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TABLE 2: FREQUENCY OF UTI AND PERINATAL OUTCOMES (N = 100)

Variable	Category	n	%
UTI	Yes	25	25.0
	No	75	75.0
Preterm labour	Yes	22	22.0
	No	78	78.0
Low birth weight	Yes	25	25.0
	No	75	75.0

TABLE 3: ASSOCIATION OF UTI WITH MATERNAL AND PERINATAL FACTORS (N = 100)

Variable	Category	UTI Yes n (%)	UTI No n (%)	p-value
Maternal age group	18–25 years	9 (36.0)	21 (28.0)	0.450
	26–35 years	16 (64.0)	54 (72.0)	
Gestational age group	24–28 weeks	7 (28.0)	23 (30.7)	0.895
	29–32 weeks	11 (44.0)	29 (38.7)	
	33–34 weeks	7 (28.0)	23 (30.7)	
Parity	Primigravida	13 (52.0)	27 (36.0)	0.157

	Multigravida	12 (48.0)	48 (64.0)	
Previous UTI	Yes	2 (8.0)	13 (17.3)	0.258
	No	23 (92.0)	62 (82.7)	
Preterm labour	Yes	9 (36.0)	13 (17.3)	0.051
	No	16 (64.0)	62 (82.7)	
Low birth weight	Yes	8 (32.0)	17 (22.7)	0.351
	No	17 (68.0)	58 (77.3)	

DISCUSSION:

Lower urinary tract infection (UTI) in pregnancy has continued to be an important obstetric issue because of its prevalence as well as its potential to have a negative influence on the perinatal outcomes. The current research was carried out to identify the rate of lower urinary tract infection among pregnant women and to assess its relationship with the perinatal outcome, especially preterm labour and low birth weight. This research indicates that UTI is a prevalent issue during pregnancy and it is closely linked with negative perinatal outcomes, which supports the necessity of regular screening of a pregnant woman and prompt treatment.

Lower urinary tract infection was observed to be 25 percent in the current study, which is not out of range of literature in the region. The prevalence of UTI in expectant women at a tertiary care hospital at Pakistan was similarly high (28%), as stated by Aslam et al., which is also expected to be the case in hospitals with a large number of expectant mothers undergoing screening due to differences in screening procedures, population demographics, and access to regular antenatal care. [12] This heterogeneity among the studies highlights the role of the socioeconomic status, hygiene behaviors, and healthcare availability in determining the epidemiology of UTI during pregnancy.

The prevalence of UTI seems to be significantly greater when there is a focus on high- risk obstetric populations. Jadoon et al. also noted a significantly higher rate of 39.4% among women who presented with preterm labour, [14] whereas Ranjan et al. noted a lower rate of 35% in pregnant women in India (UTI). [15] However, the requirements of the diagnosis may have been stricter and could have been more specific as a subgroup of clinical presentations. All these findings taken together indicate that the burden of UTI is higher in pregnancies complicated by preterm-related conditions, which validates the contributory role of infection in poor obstetric outcomes. [13]

One of the main results of the current research was the prevalence of preterm labour in women having UTI. The fact is consistent with the domestic evidence showing that maternal lower urinary tract infection and preterm labour have a strong correlation with each other. [9] Jadoon et al. have also found similar results as they noted that UTI was much more prevalent in women above 30 weeks of gestational age presenting with preterm labour because maternal urinary infections could induce inflammatory cascades that culminated in high levels of prostaglandins, uterine contractility, and cervical ripening, resulting in preterm labour. [14] The biologic plausibility of such connection is well documented since maternal urinary infections could trigger inflammatory cascades that led to a high production of prostaglandins.

Another significant perinatal outcome that was assessed in this study and was more common in the mothers with UTI was low birth weight. This observation is in line with the previous Pakistani data, which indicated a greater occurrence of low birth weight among the neonates born to mothers that had predisposition to UTI, [9] though, Ranjan et al. did not find statistically significant difference in neonatal birth weight in the UTI-positive mothers. [15] This difference could be attributed to variance in sample size, severity and timing of infection, and the effectiveness of treatment, which are factors that could affect the effect of UTI on fetal development.

The results of the current research can also be justified by alien data. The pooled prevalence rates of 18.45% in asymptomatic bacteriuria and 7.54% in lower urinary tract infection were reported by a large systematic review and meta-analysis by de Souza et al. in over 111,000 pregnant women, but an important

point is that the authors found a significant heterogeneity of rates by region and Escherichia coli as the most prevalent pathogen. [16] Notably, the review strengthened the connection between the untreated UTI and adverse events including preterm birth and low birth weight, which provides high external validity to the results of the current research. The comparatively high rate of UTI in the current study in contrast to the global estimates could be attributed to the contextual issues including delayed antenatal visit and limited screening of routine urine cultures, poor sanitation, and a lack of health literacy in the local community. These have been cited as significant contributors to the burden of maternal infection that has been a constant in low-resource settings in the region. [12-15]

Despite its strengths, this study has certain limitations. Being a single-center study with a modest sample size, the findings may not be fully generalizable. Additionally, microbiological profiling and antibiotic sensitivity patterns were not evaluated in detail, which could have provided further insight into targeted management strategies. Future multicenter studies with larger sample sizes and comprehensive microbiological analysis are recommended.

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CONCLUSION:

The present study confirms that lower urinary tract infection is a common condition during pregnancy and is significantly associated with adverse perinatal outcomes, particularly preterm labour and low birth weight. These findings, supported by both regional and international evidence, emphasize the critical importance of routine antenatal screening, early diagnosis, and timely treatment of UTIs to improve maternal and neonatal outcomes.

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