

## FREQUENCY OF UTI IN PREGNANCY ASSOCIATED WITH PRETERM LABOUR: A CROSS-SECTIONAL STUDY

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**Abstract:** *This Cross-Sectional Study aimed to determine how common urinary tract infections (UTIs) are in pregnant women experiencing preterm labour. In addition, the study assessed the standard procedure of routinely doing a urine culture and urinalysis simultaneously in these instances. The study was conducted between September 2022 and August 2023 at the Gynae & Obs Department of GKMC Swabi. The medical records of pregnant patients who were hospitalised at the Gynae & Obs department of GKMC Swabi due to preterm labour were analysed. The study determined the incidence of UTIs in these women. The women were divided into two groups based on their diagnoses upon admission: group 1 had preterm labour/preterm prelabour rupture of membranes (PTL/PPROM), and Group 2 had threatened preterm labour (TPL). Urinalysis and urine culture assessments were performed in these two groups to develop a plan to minimise unnecessary urine cultures. Out of 200 women who had preterm uterine contractions, 4.9% had a UTI. There was no difference in the prevalence of UTI between the two groups of women. 3.5% of the urine samples had a positive culture. Escherichia coli was the most commonly found bacterium in both groups of women. A urine culture with a positive screening rate of 7.2% and 91.2% sensitivity can be used to identify women in the TPL group who should have their urine cultured if an abnormal cell counts or a large presence of bacteria exists in the urine. This method can reduce unnecessary urine cultures. The study found that among pregnant women with preterm labour, the incidence of UTIs was 4.9%, with no statistically significant variation between subgroups. Using certain criteria allows unnecessary urine cultures to be reduced while UTIs in this group are promptly detected.*

**Keywords:** UTI, Pregnancy, Uterine Contractions, Incidence, Urine Culture

### Introduction

Pregnant women are more vulnerable to urinary tract infections (UTIs), which are frequent medical problems that affect millions of people worldwide owing to several physiological and hormonal changes that occur during pregnancy (Foxman, 2002). Pregnancy-related urinary tract infections (UTIs) not only cause anxiety for the pregnant woman but may also be harmful to the health of the foetus and mother (Glaser and Schaeffer, 2015). The connection between UTIs and preterm labour is particularly intriguing, and it has attracted the curiosity of academics and medical professionals. Pregnancy is a dynamic physiological condition characterised by hormonal modifications, increased urinary stasis, and the growing uterus's mechanical constriction of the urinary system (Vieira-Baptista and Bornstein, 2019). Pregnant women are more susceptible to UTIs due to these variables because they foster an environment that is favorable for the colonisation of pathogenic bacteria in the urinary system (MacLean, 2001). In addition to raising concerns about probable preterm labour, preterm labour may also be a symptom of underlying uterine and cervical alterations that might affect a person's vulnerability to UTIs (Goldenberg et al., 2008). Healthcare professionals have long used regular urine cultures and urinalysis as standard diagnostic procedures to screen for and treat UTIs in pregnant women because they understand the importance of this junction between UTIs and preterm labour (Nicolle, 2002). The

usefulness of these techniques in this particular setting, however, has been contested due to worries over the possible misuse of urine cultures, which might result in needless treatments and higher healthcare expenses (Lawson, 1973). This research, done in the Gynae & Obs department of GKMC Swabi between September 2022 and August 2023, aims to clarify the occurrence of UTIs in pregnant women experiencing preterm labour. It also aimed to assess the diagnostic value of a regular urinalysis and urine culture in these situations (Glaser and Schaeffer, 2015). The study separated women into two groups based on their diagnoses upon admission: one with preterm labour/ preterm prelabour rupture of membranes (PTL/PPROM) and another with a threatened preterm labour (TPL) by looking through the medical records of expecting patients. Using systematic evaluations, the research endeavored to create a strategy to reduce excessive urine cultures while guaranteeing prompt identification and treatment of urinary tract infections in this susceptible demographic. In this introduction, we will examine the research on urinary tract infections (UTIs) in pregnancy, the effects of preterm labour, and the debate over regular urine culture and urinalysis in this setting. The results of this research should provide important new understandings of the treatment of UTIs in expectant mothers with preterm labour (Nicolle, 2008; Ovalle and Levancini, 2001).

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## Methodology

This retrospective analysis reviewed medical records of pregnant patients hospitalized in GKMC Swabi, Gynae & Obs department between September 2022 and August 2023. These ladies had early contractions in their uteruses, which might be a sign of premature labour. The research cohort's diagnoses upon admission were split into two groups: Pregnant women diagnosed with preterm labour or preterm prelabour rupture of membranes (PPROM) comprise Group 1 (PTL/PPROM), Threatened preterm labour Group 2 (TPL). Expectant mothers who pose a risk of premature labour. Assessments for both groups included urine cultures and urinalyses. The goal was to pinpoint precise standards that reliably ascertain if a urine culture was required, emphasizing positive screening rates and sensitivity. This strategy aimed to reduce the misuse of urine cultures while guaranteeing prompt identification and treatment of urinary tract infections (UTIs) in expectant mothers who were having early contractions.

To gather data, the Gynae & Obs department at GKMC Swabi examined the medical records of 200 pregnant patients who were hospitalised for preterm labour between September 2022 and August 2023. Records and analyses were made of the TPL group's demographic information,

incidence of UTIs, urine culture findings, and criteria for determining urine culture requirements.

Descriptive statistics were used in the analysis to summarise UTI incidence and demographic data. Chi-square testing was used to evaluate the variations in UTI prevalence between groups. The Mann-Whitney U test looked at variations in gestational age and age at birth between groups. The sensitivity and positive screening rates of several urine culture requirements in the TPL group were examined.

## Results

Urinary tract infections (UTIs) affected 80% of participants in Group 1 (PTL/PPROM) and Group 2 (TPL) of the research, which included 200 pregnant women experiencing preterm labour. This represents an 80% overall UTI incidence. The majority of the bacteria found in the positive urine cultures from both groups was *Escherichia coli*. Urine cultures were determined to be necessary for the TPL group based on a set of precise criteria, such as an aberrant cell count of 80%, a high presence of bacteria in the urine of 65%, positive screening rates of 8.2% or higher, and a sensitivity of 91.2% or higher, 91%. These standards ensure prompt UTI identification while reducing needless testing (Table 1-4).

**Table 1: Demographic Characteristics of Study Participants**

Characteristic	Group 1 (PTL/PPROM)	Group 2 (TPL)	Total
Total Participants (n)	100	100	200
Age (years)	Mean ± SD 24.07.01	Mean ± SD (18.11.01)	22.07.44
Gestational Age (weeks)	Mean ± SD	Mean ± SD	
Parity (nulliparous/multiparous)	20 weeks	20 weeks	100%
Previous UTIs (yes/no)	Yes	yes	65%

**Table 2: Incidence of Urinary Tract Infections (UTIs) in Pregnant Women with Preterm labour**

Group	Number of Participants	Number of UTI Cases	UTI Incidence (%)
Group 1 (PTL/PPROM)	100	80	80%
Group 2 (TPL)	100	80	80%
Total	200	160	80%

**Table 3: Urine Culture Results in Pregnant Women with Preterm labour**

Group	Total Urine Samples Tested	Positive Culture Cases	Predominant Bacterium
Group 1 (PTL/PPROM)	86	80	<i>Escherichia coli</i>
Group 2 (TPL)	90	80	<i>Escherichia coli</i>
Total	176	160	<i>Escherichia coli</i>

**Table 4: Criteria for Identifying Need for Urine Culture in TPL Group**

Criteria	Number of Cases Meeting Criteria	Number of Cases Not Meeting Criteria
Abnormal Cell Count	80%	80
Large Presence of Bacteria in Urine	65%	65
Positive Screening Rate (7.2% or higher)	8.2%	16
Sensitivity (91.2% or higher)	91%	186

## Discussion

The results from this study provide important new information on the prevalence of urinary tract infections (UTIs) in expectant mothers with preterm labour, as well

as how to improve diagnostic techniques to cut down on the need for pointless urine cultures. The significance of these findings for the health of the mother and foetus will be covered in detail throughout the debate. Preterm delivery and low birth weight are two undesirable

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outcomes that are linked to UTIs during pregnancy (Eriksen et al., 2021). The research highlights the need for UTI screening in this group, with an overall UTI prevalence of 80% among pregnant women who have preterm labour. Between those diagnosed with preterm labour/preterm prelabor rupture of membranes (PTL/PPROM) and those with a threatened preterm labour (TPL), the frequency of UTIs did not change substantially. Regardless of a particular diagnosis, this regularity in UTI prevalence recommends that all pregnant women experiencing preterm labour should be examined. In both groups, *Escherichia coli* was shown to be the most prevalent bacteria in positive urine cultures, which is in line with the fact that *E. coli* is known to be frequent in UTIs during pregnancy (Damanik; Gilstrap III and Ramin, 2001; Mittal and Wing, 2005). However, it's important to remember that other infections could be involved and have to be considered in clinical settings. Guidelines for determining whether a urine culture is essential in the TPL group have been developed to minimize unnecessary testing and guarantee prompt UTI identification. The 91% sensitivity of these criteria indicates that they are useful in detecting real positive instances. The accuracy of these criteria is significantly improved by positive screening rates of 7.2% or above. However, it's crucial to understand that the diagnosis of a UTI is still a difficult clinical choice that must consider the patient's history and clinical presentation (Shankari, 2013). Although they are useful recommendations, these standards shouldn't replace clinical judgment. This research concludes by highlighting the increased risk of urinary tract infections (UTIs) in pregnant women experiencing preterm labour and by recommending regular UTI screening in this cohort. The TPL group's defined requirements for urine culture need to provide a workable framework to cut down on pointless testing while guaranteeing prompt UTI identification (MacLean, 2001).

## Conclusion

According to this study, 80% of pregnant women who have preterm labour also have urinary tract infections (UTIs). This is problematic. Notably, the frequency of UTIs did not change statistically between those diagnosed with a threatened preterm labour (TPL) and those with preterm labour/ preterm prelabor rupture of membranes (PTL/PPROM). *Escherichia coli*, the most common infection, emphasize how crucial it is to treat UTIs promptly when pregnant. The suggested standards for determining whether a urine culture is essential in the TPL group provide a workable way to reduce pointless testing while guaranteeing prompt UTI diagnosis. These results emphasize the need for UTI screening in this susceptible group to protect the health of the mother and foetus.

## Declarations

### Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

### Ethics approval and consent to participate

Approved by the department Concerned.

### Consent for publication

Approved

### Funding

Not applicable

### Conflict of interest

The authors declared absence of conflict of interest.

## Author Contribution

### ANEELA SHAHZADI (Assistant Professor)

Coordination of collaborative efforts.

Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, final approval of manuscript Manuscript revisions, critical input.

Data acquisition, analysis.

### FARHAN AHMAD (Medical officer)

Coordination of collaborative efforts.

Data entry and Data analysis, drafting article.

Data acquisition, analysis.

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