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A Study To Assess The Incidence And Associated Factors Of Urinary Tract Infection Among Pregnant Women Attending Antenatal Clinics At Selected Rural Hospitals Of Indore District, Madhya Pradesh

Leen Khatri

Abstract

Background:

Urinary tract infection (UTI) is one of the most frequently encountered infections during pregnancy and poses serious risks to both mother and fetus if left untreated. Early identification of risk factors is essential for prevention and effective management.

Objectives:

1. To assess the **incidence of urinary tract infection** among pregnant women attending antenatal clinics in selected rural hospitals of Indore district, Madhya Pradesh.
2. To identify the **associated factors of urinary tract infection** among pregnant women.
3. To determine the **association between urinary tract infection and selected socio-demographic variables** of pregnant women.
4. To determine the **association between urinary tract infection and selected obstetric variables** of pregnant women.

Methods:

A hospital-based descriptive study was conducted among **120 pregnant women** attending antenatal clinics in selected rural hospitals of Indore district, Madhya Pradesh Participants were selected using convenience sampling. Data were collected using a structured questionnaire and laboratory urine examination reports. Descriptive and inferential statistics were used for data analysis.

Results:

The incidence of urinary tract infection was found to be **26.7%**. Major associated factors included poor perineal hygiene (61%), inadequate water intake (55%), anemia (46%), previous UTI history (40%), and multiparity (34%). Significant association was observed between UTI and gestational age, hemoglobin level, and hygiene practices ($p < 0.05$).

Conclusion:

Urinary tract infection remains a common health problem among pregnant women. Strengthening antenatal screening and educating women about preventive measures can significantly reduce maternal and fetal complications.

Keywords: Urinary tract infection, Pregnancy, Antenatal women, Risk factors, Rural health

Introduction

Pregnancy is a physiological condition that brings about significant hormonal, anatomical, and functional changes in the urinary system, thereby increasing a woman's susceptibility to urinary tract infections (UTIs). Elevated levels of progesterone during pregnancy cause relaxation of smooth muscles, leading to dilatation of the ureters and decreased bladder tone. These changes result in urinary stasis and vesicoureteral reflux, which create a favorable environment for bacterial colonization and ascending urinary tract infections. UTIs during pregnancy may present as asymptomatic bacteriuria or symptomatic infection, and if left untreated, can progress to serious maternal and fetal complications.

Urinary tract infections in pregnancy are associated with adverse outcomes such as pyelonephritis, anemia, preterm labor, low birth weight, and increased perinatal morbidity. Due to these potential complications, UTIs remain an important clinical and public health concern in antenatal care. Early identification and timely management are crucial to prevent disease progression and improve pregnancy outcomes.

In developing countries like India, the burden of urinary tract infections among pregnant women remains high. Contributing factors include poor personal and perineal hygiene, anemia, low socioeconomic status, inadequate access to healthcare services, and lack of awareness regarding preventive measures. Rural and semi-urban populations are particularly vulnerable due to limited health education and delayed health-

seeking behavior. Since most of the risk factors for UTIs during pregnancy are preventable and modifiable, routine screening and health education during antenatal visits play a vital role in reducing the incidence of infection and improving maternal and neonatal outcomes.

Objectives of the Study

5. To assess the **incidence of urinary tract infection** among pregnant women attending antenatal clinics in selected rural hospitals of Barabanki district, Uttar Pradesh.
6. To identify the **associated factors of urinary tract infection** among pregnant women.
7. To determine the **association between urinary tract infection and selected socio-demographic variables** of pregnant women.
8. To determine the **association between urinary tract infection and selected obstetric variables** of pregnant women.

Hypotheses

Research Hypotheses (H_1)

- **H_{11}:** There is a significant association between urinary tract infection and selected socio-demographic variables of pregnant women.
- **H_{12}:** There is a significant association between urinary tract infection and selected obstetric variables of pregnant women.
- **H_{13}:** There is a significant association between urinary tract infection and selected associated factors among pregnant women.

Methodology

Research Design

A **descriptive cross-sectional research design** was adopted to assess the incidence of urinary tract infection and its associated factors among pregnant women.

Study Setting

The study was conducted in **selected rural hospitals of Indore district, Madhya Pradesh** among women attending antenatal outpatient departments.

Population

The target population comprised **pregnant women attending antenatal clinics (ANC)** in the selected rural hospitals during the study period.

Sample Size

A total of **120 pregnant women** were included in the study.

Sampling Technique

A **non-probability convenience sampling technique** was used to select the study participants based on availability and willingness to participate.

Inclusion Criteria

- Pregnant women attending antenatal clinics
- Women from **all three trimesters of pregnancy**
- Pregnant women who were **willing to participate** in the study

Exclusion Criteria

- Pregnant women who were **on antibiotic therapy** at the time of data collection
- Pregnant women with **diagnosed renal or chronic urinary tract diseases**

Tools for Data Collection

Data were collected using the following tools:

1. **Structured demographic and obstetric questionnaire**, which included information on age, education, occupation, parity, gestational age, and previous history of urinary tract infection.
2. **Risk factor checklist** to assess factors such as personal and perineal hygiene practices, fluid intake, anemia status, and previous history of UTI.
3. **Urine routine examination and urine culture reports** to confirm the presence or absence of urinary tract infection.

Data Collection Procedure

After obtaining ethical clearance and written informed consent, data were collected through interviews using the structured questionnaire. Laboratory reports of urine routine examination and culture were reviewed to identify UTI status among the participants.

Data Analysis

Collected data were coded and entered into a master sheet for analysis.

- **Descriptive statistics** such as frequency, percentage, mean, and standard deviation were used to describe demographic variables, incidence of UTI, and associated factors.
- **Inferential statistics**, specifically the **Chi-square test**, were used to determine the association between urinary tract infection and selected variables.

A p-value of **< 0.05** was considered statistically significant.

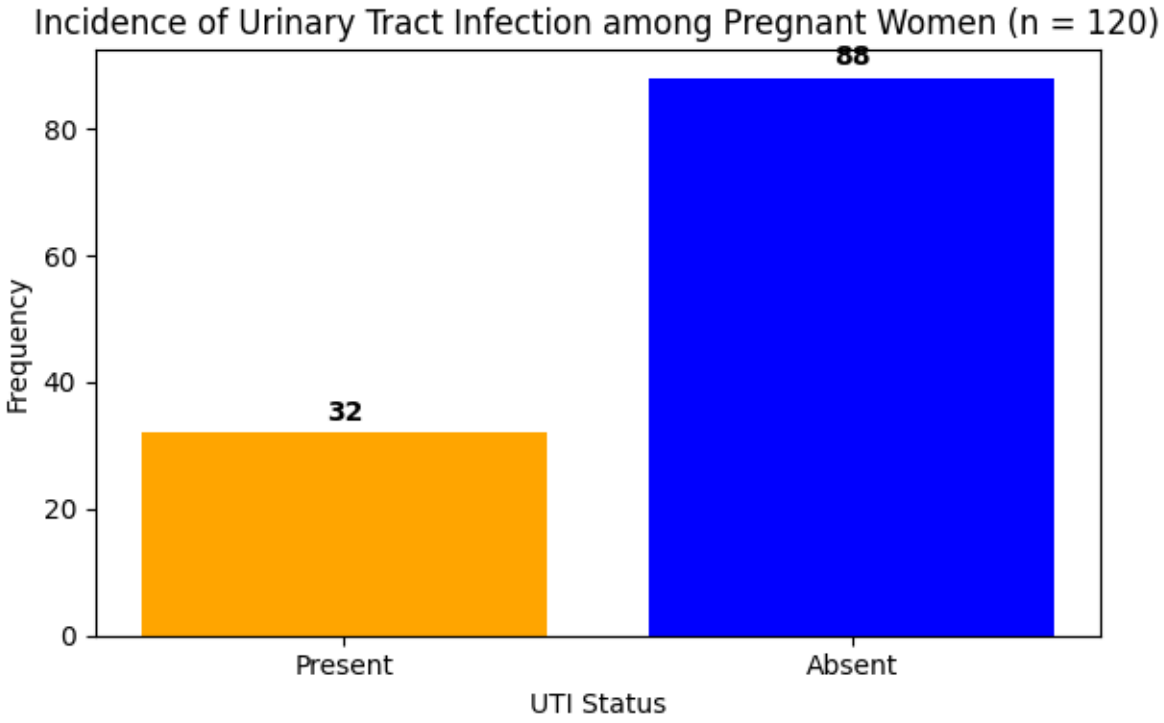
Results

Incidence of Urinary Tract Infection among Pregnant Women (n = 120)

The incidence of urinary tract infection among the study participants revealed that **32 (26.7%)** pregnant women were diagnosed with urinary tract infection, while **88 (73.3%)** women did not have urinary tract infection. This finding indicates that more than one-fourth of the pregnant women attending antenatal clinics were affected by urinary tract infection.

Table 1: Distribution of Pregnant Women According to UTI Status

UTI Status	Frequency (n)	Percentage (%)
Present	32	26.7
Absent	88	73.3
Total	**120**	**100**

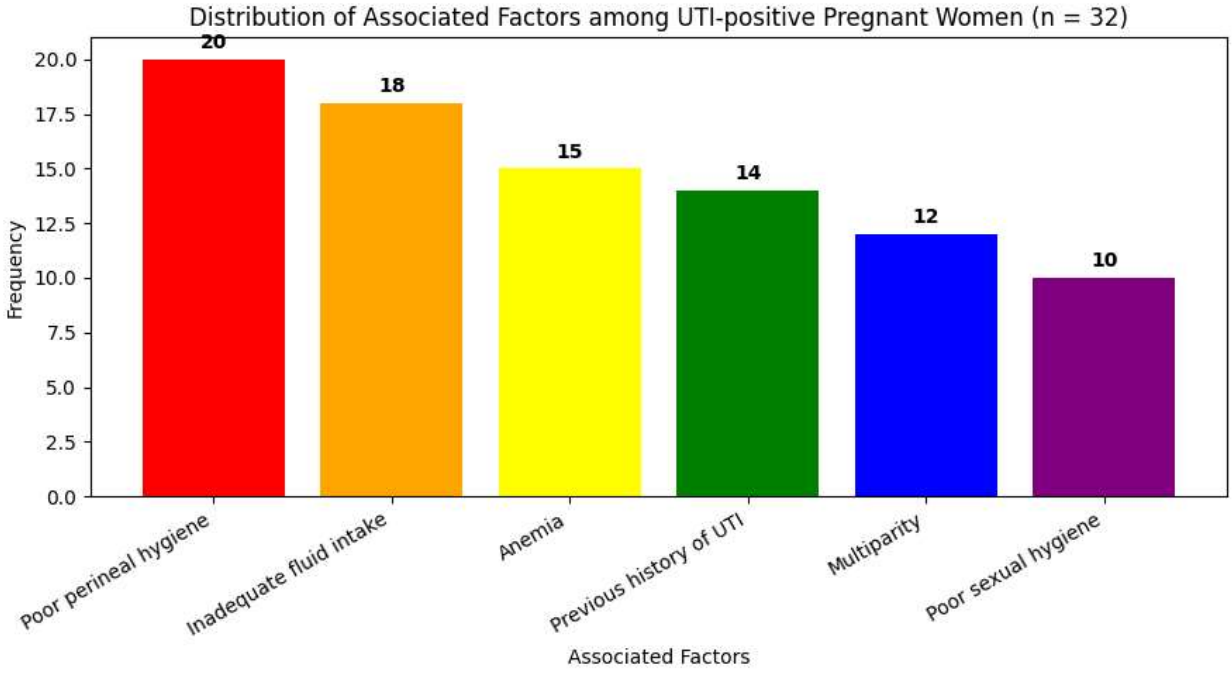


Distribution of Associated Factors among UTI-Positive Pregnant Women (n = 32)

Among the 32 pregnant women diagnosed with urinary tract infection, **poor perineal hygiene** was the most frequently observed associated factor, present in **20 (62.5%)** women. **Inadequate fluid intake** was reported by **18 (56.3%)**, while **anemia** was identified in **15 (46.9%)** women. A **previous history of urinary tract infection** was reported by **14 (43.8%)** participants. **Multiparity** was observed in **12 (37.5%)** women, and **poor sexual hygiene practices** were present in **10 (31.3%)** women.

Table 2: Distribution of Associated Factors among UTI-Positive Pregnant Women

Associated Factor	Frequency (n)	Percentage (%)
Poor perineal hygiene	20	62.5
Inadequate fluid intake	18	56.3
Anemia	15	46.9
Previous history of UTI	14	43.8
Multiparity	12	37.5
Poor sexual hygiene	10	31.3



Association between Urinary Tract Infection and Selected Variables

The association between urinary tract infection and selected socio-demographic and obstetric variables was analyzed using the Chi-square test. The findings revealed a **statistically significant association ($p < 0.05$)** between urinary tract infection and **gestational age**, **hemoglobin level**, and **perineal hygiene practices**.

Pregnant women in the **second and third trimesters** showed a higher incidence of urinary tract infection compared to those in the first trimester. Similarly, women with **hemoglobin levels below 11 g/dL** had a significantly higher prevalence of urinary tract infection than women with normal hemoglobin levels. Poor perineal hygiene practices were strongly associated with the occurrence of urinary tract infection.

No statistically significant association was found between urinary tract infection and selected variables such as age, educational status, occupation, or socioeconomic status.

Summary of Key Findings

- The incidence of urinary tract infection among pregnant women was **26.7%**.
- Poor perineal hygiene, inadequate fluid intake, and anemia were the most common associated factors.
- A significant association was observed between urinary tract infection and gestational age, hemoglobin level, and hygiene practices ($p < 0.05$).

Discussion

The findings of the present study indicate that urinary tract infection remains a common health problem during pregnancy, with an incidence of 26.7% among the study participants. This finding is consistent with previous Indian studies that have reported UTI prevalence ranging between 20% and 30% among pregnant women. The relatively high incidence highlights the vulnerability of pregnant women to urinary tract infections due to physiological and anatomical changes during pregnancy.

Poor perineal hygiene emerged as one of the most significant contributing factors to the occurrence of urinary tract infection. Inadequate fluid intake and anemia were also found to be major associated factors. These findings suggest that modifiable lifestyle and hygienic practices play a crucial role in the development of UTIs during pregnancy. The significant association observed between UTI and hemoglobin level indicates that anemia may reduce immune resistance, thereby increasing susceptibility to infection.

The study also revealed a statistically significant association between urinary tract infection and gestational age, with higher incidence observed during the second and third trimesters. This may be attributed to increased urinary stasis and progressive anatomical changes as pregnancy advances. The findings emphasize the importance of routine screening and health education as integral components of antenatal care to prevent complications associated with urinary tract infections.

Conclusion

The study concludes that urinary tract infection is **prevalent among pregnant women** and is significantly associated with **preventable and modifiable risk factors**, such as poor personal hygiene, inadequate fluid intake, and anemia. Early detection through routine urine screening, along with appropriate health education and timely treatment, can substantially reduce maternal and fetal complications related to urinary tract infections during pregnancy.

Recommendations

Based on the findings of the study, the following recommendations are made:

- Routine **urine screening** for all pregnant women during antenatal visits
- **Health education programs** focusing on personal and perineal hygiene and adequate hydration
- **Early identification and management of anemia** during pregnancy
- Strengthening **antenatal counseling services** to promote preventive health behaviors

Ethical Considerations

Ethical approval for the study was obtained from the **Institutional Ethics Committee** prior to data collection. Written informed consent was obtained from all participants after explaining the purpose of the study. Confidentiality and anonymity of the participants were maintained throughout the study, and participants were informed of their right to withdraw from the study at any time without any repercussions.

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