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Bacteriological Profile and Antibiogram of UTI in Pregnant Mother: A Study at Maternity hospital in North Bihar.

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Abstract

Introduction: Urinary tract infections frequently occurs in pregnant mothers. This problem causes significant morbidity and increases healthcare expenditure . Three common clinical manifestations of UTIs in pregnancy are: asymptomatic bacteriuria, acute cystitis and acute pyelonephritis[567]. Escherichia coli is the most organism isolated in pregnant mother having UTIs. All pregnant mothers should be screened for UTIs in pregnancy and antibiotics should be started without delay. Urine culture and antibiogram is the gold standard in diagnosing and treating UTIs[123].

Aims and Objectives: To know the bacteriological profile and Antibiogram of urinary tract infection in pregnancy.

Material and Methods: all pregnant women who come to hospital for antenatal visits are screened for UTI. All antenatal mother who comes to antenatal OPD were randomly selected into the study (Upon verbal informed consent,) either had symptoms suggestive of urinary tract infections clinically or without any symptoms were only included. Mid-stream clean catch urine sample sent for microbiological culture and sensitivity. We conducted a retrospective cohort study at Indra hospital, supaul. The study population consisted of 200 women in the antenatal pts[9,10,11].

Results: A total of 200 urine samples were received from pregnant women and processed in Microbiology laboratory from Jan to Dec 2024 .Among 200 samples, 85(42.5 %) samples yielded significant bacterial growth. E.coli (30, 35 %) was isolated as predominant pathogen. E. Coli and Klebsiella were sensitive to nitrofurantoin which can be used in pregnancy. Other organism isolated organisms are Staphylococcus aureus, CONS, Enterococci and Acinetobacter.

Conclusion: This study showed that prevalence of UTI in pregnant women was 42.5%. It was also observed that E. coli (35%) was the most frequently isolated bacteria. All pregnant women should be screened for UTI with a urine culture and treated with according to results, significant predictors of bacteriuria in pregnancy history include UTI and renal risk factors like Renal calculi, CKD and nulliparity[19,20,21]. Women with UTI in pregnancy are more likely to have preterm delivery. However, adequate management can minimize other complications like pyelonephritis and adverse perinatal outcomes.

Keywords: Bacteria, UTI, Antenatal mother

INTRODUCTION

Urinary tract infections (UTIs) represent a major health concern during pregnancy due to anatomical and physiological changes that predispose women to infection. A urinary tract infection (UTI) is an infection of the urinary system. It can occur in different parts of the urinary tract, including the bladder (cystitis) and kidneys (pyelonephritis). The bacteria usually come from the gut (digestive system) where they don't cause problems and move to the urinary tract.These infections, if untreated, can lead to significant maternal and fetal complications including pyelonephritis, preterm labor, low birth weight, and increased perinatal mortality. Sometimes bacteria are found in the urinary tract, but mother don't have any symptoms of an infection. This is known as asymptomatic bacteriuria. we will test for this in first trimester of pregnancy by asking mother to provide a urine sample. If pt have bacteria in your urine, even if you don't have symptoms, your doctor will prescribe treatment, to prevent problems for mother and her baby. UTIs in pregnancy may

present in various forms—namely, asymptomatic bacteriuria, acute cystitis, and acute pyelonephritis—with asymptomatic bacteriuria being the most frequent. UTIs can affect women whether they are pregnant or not. If they're pregnant, they have up to a 1 in 10 chance of having a UTI. It is the most common infection in pregnancy. If you have a UTI while you're pregnant, you are also more likely to develop other, more harmful, infections.
The most common causative agent of UTIs is Escherichia coli, although other uropathogens may also be implicated. Because UTIs during pregnancy are often asymptomatic, it is crucial to perform routine urine cultures during antenatal care. Urine culture and antibiotic sensitivity testing remain the gold standard for diagnosis and effective management.
This study aims to investigate the bacteriological profile of UTIs among pregnant women attending antenatal clinics and evaluate the antibiotic sensitivity of the isolated organisms to guide effective treatment strategies.

Aims and Objectives
The primary aim of this study was to:
•Determine the bacteriological profile of urinary tract infections in pregnant women.
•Evaluate the antibiotic sensitivity patterns of the isolated pathogens.
•Highlight the importance of routine UTI screening during antenatal care to improve maternal and fetal outcomes.

Materials and Methods
Study Design and Setting:
This retrospective cohort study was conducted at Indra Hospital, Supaul, Bihar, India.
Study Duration:
January 2024 to December 2024
Study Population:
The study included 200 pregnant women attending the antenatal outpatient department during the study period.
Inclusion Criteria:
- Pregnant women of any gestational age
- Those who gave verbal informed consent
- Both symptomatic and asymptomatic individuals for UTI

Exclusion Criteria:
- Women on antibiotics within the past week
- Known cases of genitourinary abnormalities

Sample Collection:
Clean-catch midstream urine samples were collected in sterile containers from all enrolled participants. The samples were transported to the Microbiology Laboratory and processed within two hours of collection[7,8,9].
Microbiological Examination:
Samples were inoculated on CLED and MacConkey agar and incubated at 37°C for 24 hours. Bacterial growth of >10^5 CFU/mL was considered significant. Identified organisms were subjected to antibiotic sensitivity testing using the Kirby-Bauer disk diffusion method in accordance with CLSI guidelines.
Data Analysis:
Descriptive statistics were used to analyze demographic data, prevalence, and microbial patterns. Antibiotic susceptibility was evaluated as percentages of sensitive isolates.

Results
Out of 200 urine samples collected from pregnant women, 85 (42.5%) showed significant bacterial growth. The age range of participants was 18–38 years, with the majority being primigravida.
Table 1: Prevalence of Bacterial Isolates (n=85)

Organism Isolated	Number of Isolates	Percentage (%)
Escherichia coli	30	35.3%
Klebsiella spp.	20	23.5%
Staphylococcus aureus	12	14.1%
CONS	10	11.8%
Enterococcus spp.	8	9.4%
Acinetobacter spp.	5	5.9%

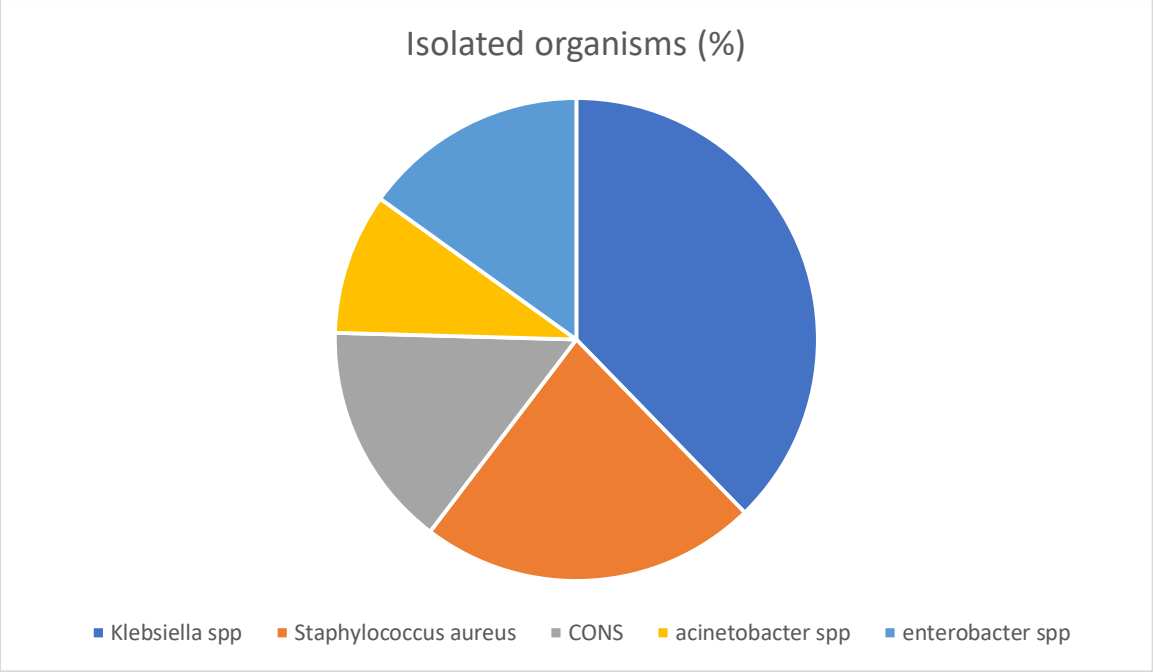


Table 2: Antibiotic Sensitivity Pattern of Common Isolates

Antibiotic	E. coli(%)	Klebsiella (%)
Nitrofurantoin	93%	90%
Amoxicillin-Clav	68%	64%
Ciprofloxacin	60%	58%
Ceftriaxone	55%	50%
Gentamicin	70%	65%

Discussion

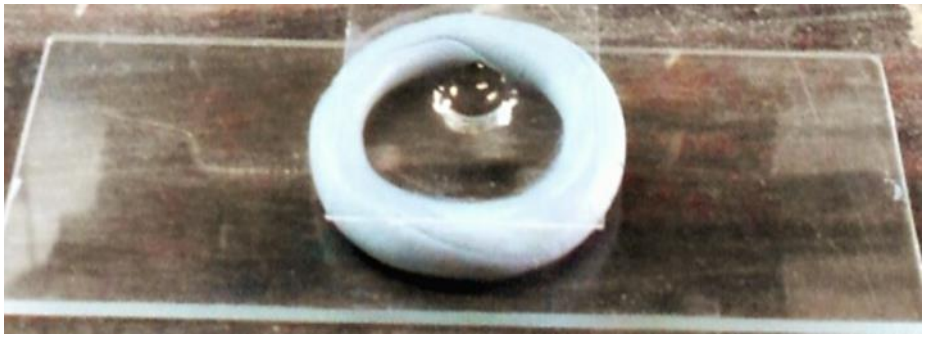
This study demonstrated a 42.5% prevalence of UTIs in pregnant women, consistent with other regional studies. E. coli emerged as the most common uropathogens, which aligns with global trends[11,12,13]. The high sensitivity of E. coli and Klebsiella to nitrofurantoin reinforces its continued use as a first-line empirical treatment in pregnancy[16].

The presence of multidrug-resistant organisms like Acinetobacter raises concerns about antibiotic stewardship. Regular monitoring of sensitivity patterns is essential to ensure effective treatment and avoid complications[15,16,17,22].

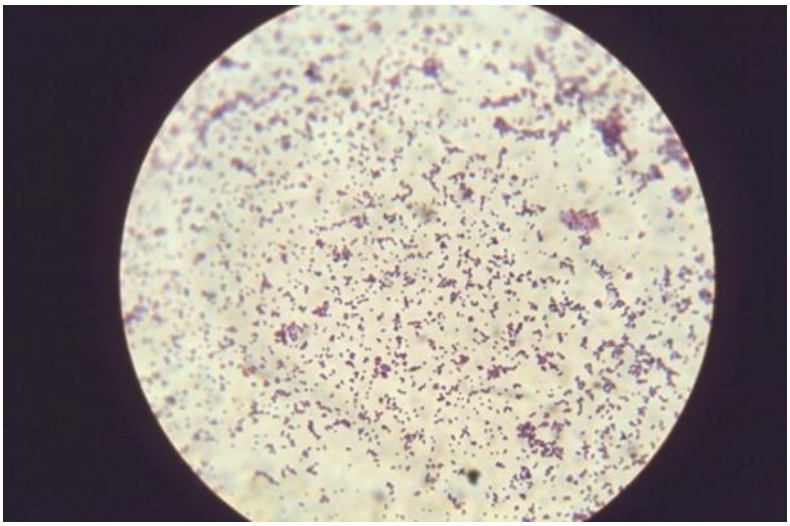
Significant risk factors identified in this study included nulliparity, previous history of UTIs, renal calculi, and chronic kidney disease (CKD). Early detection and appropriate management are crucial in preventing progression to pyelonephritis and reducing risks of preterm labor and low birth weight.

Conclusion

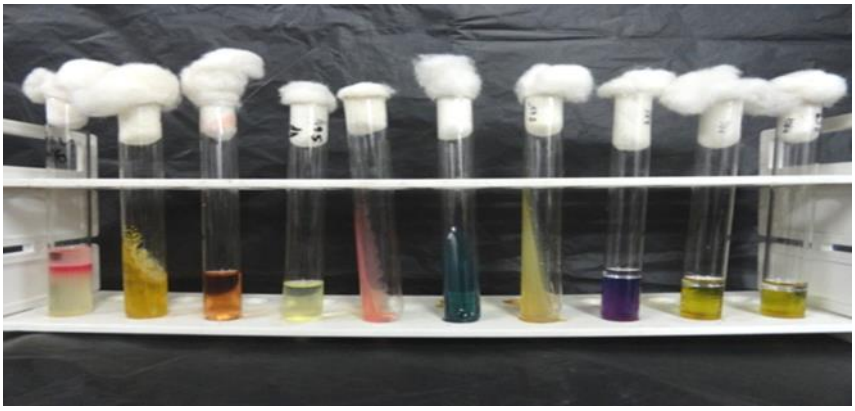
This study highlights a high prevalence of UTIs among pregnant women, with E. coli being the predominant pathogen. Routine urine culture and sensitivity testing are critical in antenatal care. Empirical treatment should be based on local antibiogram data to avoid complications and ensure maternal-fetal well-being.



Hanging drop preparation.



Gram positive cocci in cluster.



Biochemical reactions of E. coli.

Growth of E. coli in MacConkey's

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