

“To Study the Etiology, Prevalence and Antibiotic Resistant Pattern of Urinary Tract Infection among Pregnant Women at a Tertiary Care Centre in Kanpur”

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Abstract:

Introduction:-Urinary tract infection (UTI) describes microbial colonization or inflammation of the bladder (cystitis), urethra (urethritis), or renal pelvis and kidneys (pyelonephritis). Urinary Tract Infections (UTIs) commonly occur during pregnancy, due to the morphological and physiological changes that take place in the genitourinary tract.

Aim:-The study aimed to determine the etiology, prevalence and antibiotic resistant pattern of urinary tract infection among pregnant women at a tertiary care centre in Kanpur.

Material and Method:-A total of 250 pregnant women who were aged between 18 to 45 were selected for the study. Mid stream urine was collected following the standard protocol and immediately processed in the laboratory. Routine urinary microscopy and urine culture was done in all cases. Antibiotic susceptibility testing was done following CLSI guidelines 2019.

Results: In the present study, out of 250 samples prevalence of urinary tract infection in pregnancy was (16%) Most common organism isolated in urine cultures was E.coli (38%) followed by Klebsiella pneumonia (28%), K.oxytoca(19%), Staphylococcus species(11%) and Proteus mirabilis(4%). Antibiotic susceptibility testing of the isolated organism showed that Gentamicin was the most effective antibiotic.

Conclusion: Since the prevalence of UTI in pregnant women was 16%, this study concludes that, Routine urine culture test should be carried out for all antenatal women, to detect prevalence and risk factors, and every positive case should be treated with appropriate antibiotic therapy, to prevent any obstetric complication which is associated with pregnancy.

Keywords: Escherichia coli, pregnant women, Urinary tract infection

Introduction

Urinary tract infection (UTI) in pregnancy, including asymptomatic bacteriuria, is associated with maternal morbidity and adverse pregnancy outcomes, including preterm birth and low birth weight. Maternal urinary tract infections may trigger an inflammatory response, including the release of chemokines and cytokines that may result in deciduas activation, prostaglandin release, and cervical ripening, thereby increasing the risk of preterm birth.[1] In historical studies, approximately 30– 50% of women with pyelonephritis delivered preterm.[2-4]

Aim

The study aimed to determine the etiology, prevalence and antibiotic resistant pattern of urinary tract infection among pregnant women at a tertiary care centre in Kanpur.

Material and Method

A total of 250 pregnant women who were aged between 18 to 45 were selected for the study. The inclusion criteria were pregnant women with suspected clinical symptoms of urinary tract infection such as; The frequency of urination, fever, dysuria, painful burning sensation, incomplete bladder voiding, lower abdominal pain, flank pain and changed urine color. The pregnant women under antibiotic regimen within 72 hours of sample/data collection were excluded from the study because the antibiotic must have inhibited or destroyed the pathogens. Clean-catch midstream urine specimen was collected by the pregnant women after given adequate and careful instructions for urine sample collection technique. The urine sample was inoculated on CLED agar plate and then plates were put for the overnight incubation at 37°C in the incubator under perfectly aerobic conditions. The urine culture plates were examined macroscopically to identify the color, appearance, morphology, and the colonies size. The isolated bacteria were diagnosed by using Gram stain and biochemical test, and microscopic examination. Antimicrobial susceptibility of isolated bacteria was examined to determine the proper antibiotic use. Antibiotic susceptibility testing was done following CLSI guidelines 2019[5].

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Results

In the present study, out of 250 pregnant women, 40 women (16%) were positive for Urinary tract pathogens. Most common organism isolated in urine cultures was *E.coli* (38%) followed by *Klebsiella pneumoniae* (28%), *Klebsiella oxytoca* (19%), *Staphylococcus species* (11%) and *Proteus mirabilis* (4%). In this study antibiotic resistant pattern of urine isolates were mentioned in fig 3

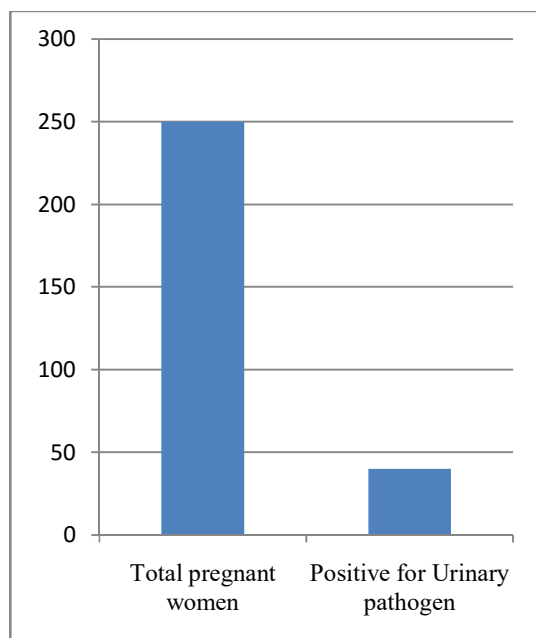


Figure 1: No. of Pregnant women positive for UTI

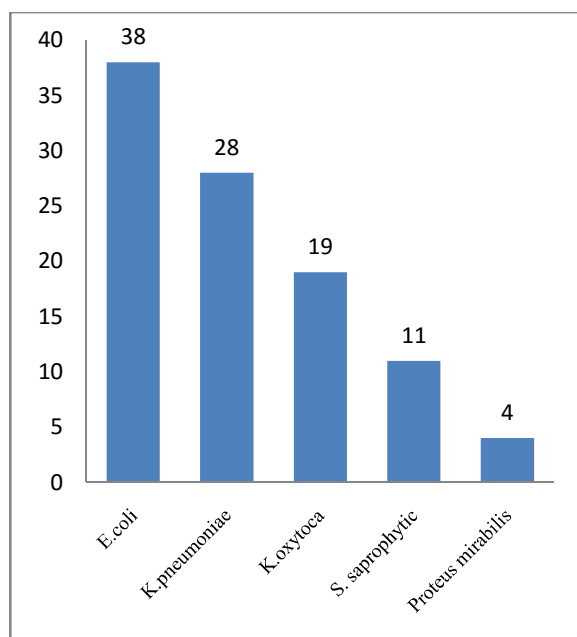


Figure 2: Microorganism isolated from Urine samples

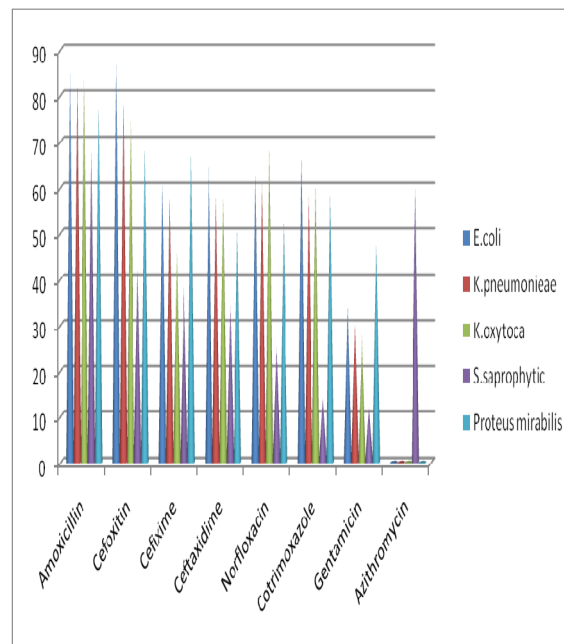


Figure 3: Antibiotic resistant pattern of Urine Isolates.

Discussion

In the present study, out of 250 pregnant women, 40 women (16%) were positive for Urinary tract pathogens. There are two studies in urban settings in northern India reported higher prevalence of ASB and UTI, ranging from 19.9% ASB prevalence in primary care clinics [6] to 25.5% prevalence of symptomatic UTI in a tertiary care ANC clinic in Lucknow[7]. In spite of the advances in medical and health care nowadays, this contrast in prevalence may be due to change in the studied sample and place of data collection. Less paternal education and maternal under nutrition were significant risk factors for UTI in this population. Poor hygiene practices may be more common in first time mothers of young age and those with low SES, and predispose them to urinary tract infection. Gram-negative organisms, *E. coli* and *Klebsiella* species, were common etiologies of UTI. In this study also 38%, 28% and 19% of *E.coli*, *K. pneumoniae* and *K. oxytoca* respectively was isolated. Other studies of UTI etiology have similarly reported a predominance of gram negatives, particularly *E. coli*, which comprised 59–75% of isolates, and *Klebsiella* species, which ranged from 6 to 11% of isolates [8, 9]

In a 5-year, large, prospective study of pregnant women in a tertiary care hospital in India, *E. coli* and *Klebsiella pneumoniae* were the most common uro-pathogens (42 and 22% of isolates, respectively).[10] In this population, gram-positive organisms Specifically, *Staphylococcal saprophytic* (CONS) were contributing to 11% of positive cultures.

The majority of these isolates were presumably *Staphylococcus saprophyticus*, a leading cause of cystitis in young women.

A study in Bangalore reported 10.6% of positive cultures comprised *S. Saprophyticus*. [11] While other studies have reported that *S. saprophyticus* comprised 23% of uropathogens [12]

In this study Rates of antibiotic resistance were high. More than 75% of *E.coli*, *K. pneumoniae* and *K. oxytoca* were resistant to Amoxicillin and Cefoxitin. Only Gentamycin were show high sensitivity compared to others.

Conclusion

Since the prevalence of UTI in pregnant women was 16%, this study concludes that, Routine urine culture test should be carried out for all antenatal women, to detect prevalence and risk factors, and every positive case should be treated with appropriate antibiotic therapy, to prevent any obstetric complication which is associated with pregnancy.

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