



Incidence and AntibioGram of Uropathogens isolated from pregnant women with urinary tract infection

KEYWORDS

Urinary Tract Infection (UTI), pregnant women, AntibioGram.

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ABSTRACT

Urinary tract infection (UTI) is a common bacterial infection in women during pregnancy leading to perinatal and maternal morbidity and mortality. The causative bacteria have remained the same but there has been an increasing resistance to the available antibiotics. The main objective was to study the prevalence of UTI in pregnant women, isolation of common causative bacteria, and their antibiogram. It was observed that UTI was prevalent in pregnant women belonging to age group 28-32 and frequently isolated bacteria was *E.coli* followed by *Klebsiella* sp., *Proteus* sp., *Staphylococcus* sp. and *Pseudomonas* sp. *Antibiogram* study has shown that *uropathogens* were resistant to Ampicillin and the greatest activity was shown against *Nitrofurantoin*.

Introduction:

A urinary tract infection (UTI) is an infection that affects part of the urinary tract. Symptoms from a lower urinary tract include painful urination, frequent urination or urge to urinate (or both). In the elderly and the very young, symptoms may be vague or non-specific. The commonest urinary pathogen is *Escherichia coli* [1]. Enterobacteriaceae and *Escherichia coli* in particular are the notorious pathogens [2] causing infections by adhering to, invading, and replicating the umbrella cells of the bladder epithelium [3]. *E. coli* replication is facilitated by inflammation, leading to increased bacterial survival and invasion to the deeper layers of the urothelium. Consequently, these urothelial cells become reservoirs in which pathogens persist in a quiescent state becomes reservoirs and may be the source of recurrent UTIs.

Other etiological agents for UTI are *Enterococcus*, *Klebsiella*, *Enterobacter*, *Citrobacter*, *Serratia*, *Pseudomonas aeruginosa*, *Providencia*, and *Staphylococcus epidermidis* [4], all termed as uropathogens.

Urinary tract infections occur more commonly in women more frequent during pregnancy than in men. Risk factors include female anatomy, sexual intercourse and family history.

Pregnancy causes numerous changes in the woman's body. Hormonal and mechanical changes increase the risk of urinary stasis and vesicoureteral reflux. These changes, along with an already short urethra (approximately 3-4 cm in females) and difficulty with hygiene due to a distended pregnant belly, increases the frequency of urinary tract infections (UTIs) in pregnant women also increases the risk of serious infectious complications from symptomatic and asymptomatic urinary infections even in healthy pregnant women [5].

If it is not treated on time, infection may progress to cause serious complications. Treatment of UTI includes a short course of antibiotics, although resistance to many of the antibiotics is increasing. Some antibiotics are not safe to take during pregnancy; hence selecting an appropriate antibiotic is of major concern. Factors such as drug effectiveness, stage of pregnancy, mother's health and potential ef-

fects on fetus are taken into consideration.

Microorganisms causing UTI vary in their susceptibility to antimicrobials [6] and the choice of antibiotic treatment is generally guided by susceptibility data by Microbiological Laboratories [7, 8]. As resistance to antibiotics is increasing, constant updating of antibiotic sensitivity against uropathogens is essential.

The aim of this study was to determine the prevalence of UTI in pregnant women, isolation of causative bacteria and determination of antibiotic susceptibility patterns of isolated Uropathogens.

Materials and Method

1) Collection of Samples

Mid stream urine specimens of pregnant women of different age group were collected from G.M.C, Nagpur. Women were instructed to collect the samples in sterile bottles. Analysis was done within 24 hrs after collection.

Bacterial load was determined by plating method on Mac conkey agar and incubated at 37°C for 24 hrs and for 48hrs in negative cases [9]. Total aerobic count was determined by using a Colony Counter. A specimen was considered positive for UTI when number of colonies were ≥ 105 cfu/mL^[10].

2) Isolation and Identification

Positive samples for UTI were subjected to Gram staining and were streaked on selective media. They were further processed for species identification by standard biochemical tests [11].

3) Susceptibility Testing

Antibiotic susceptibility test was performed by Kirby Bauer's Disc diffusion method [12] using Muller Hinton agar. Antibiotics tested against uropathogens were: Ampicillin, Amoxicillin, Cephalexin, Nitrofurantoin and Sulfisoxazole [5]. Susceptibility pattern was noted after 24 hrs of incubation.

Results

1) Collected specimens were subjected for further testing. Bacterial load was determined and the samples showing more than 10⁵cfu/ml colonies were considered as infected. Percentage of no. of infected samples was calculated. (Figure: 1).

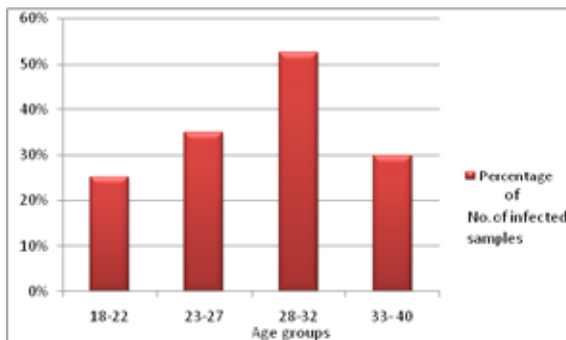


Figure 1: Percentage of number of infected urine samples

2) Isolation and Identification

On the basis of Morphological, Biochemical and Cultural characteristics, the organisms were identified as E.Coli., Klebsiella sp., Proteus sp., Staphylococcus sp. and Pseudomonas sp. and No. of isolates of each obtained in the positive samples are shown in Figure: 2

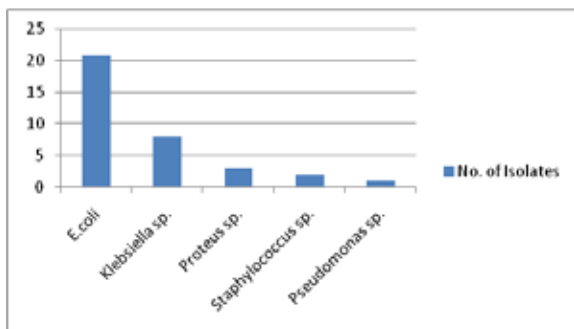


Figure: 2 Frequency of occurrence of Uropathogens

3) Susceptibility Testing

Susceptibility testing was carried out by Kirby Bauer's disc diffusion method. Antibiotics which were safe in pregnancy were tested against the Uropathogens isolated from the urine sample of pregnant women with urinary tract infection. As microorganisms are acquiring resistance against antibiotics, antibiotic susceptibility is evaluated.

Zone of Inhibition was measured and it was found that E.Coli was resistant to Ampicillin and sensitive to Amoxicillin, Cephalixin, Nitrofurantoin and Sulfisoxazole.

Klebsiella sp. was found to be sensitive to all the antibiotics except ampicillin. Proteus sp. was found to be resistant to Ampicillin and amoxicillin. Staphylococcus sp. was sensitive to Amoxicillin, ampicillin, Cephalixin and nitrofurantoin. Pseudomonas sp. was found to be resistant to Nitrofurantoin and sensitive to other antibiotics, whereas highest activity was shown by sulfisoxazole (Figure 3).

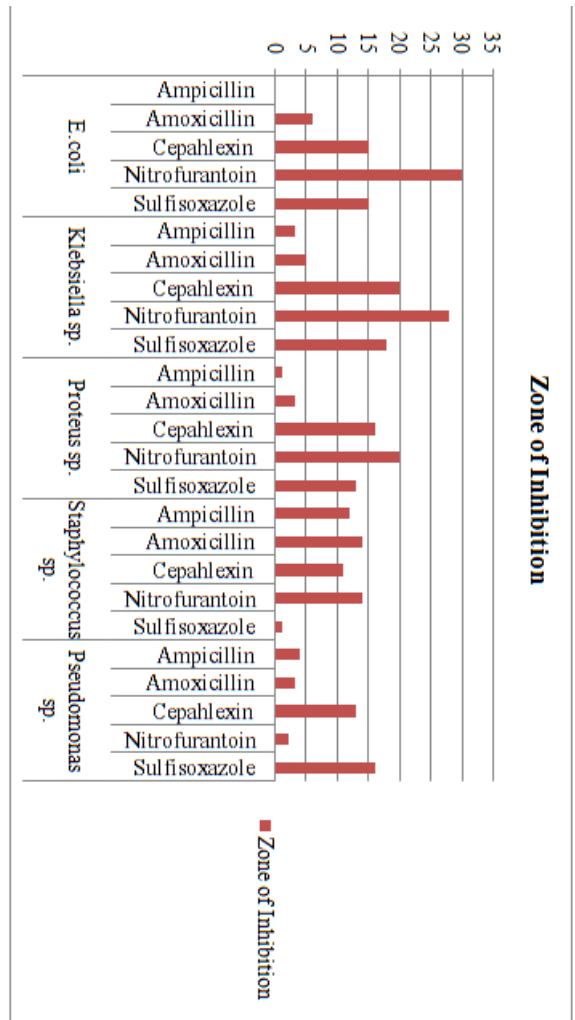


Figure 3: Antibiotic Susceptibility pattern of isolated Uropathogens

Discussion

Urinary tract infection is the most common bacterial infection in pregnant women. It would lead to serious complications if left untreated. Antibiotics are prescribed for the treatment of UTI. But as not all antibiotics are safe during pregnancy, selection of proper antibiotics is of major concern. This study dealt with the determination of prevalence of UTI in pregnant women of different age groups, Isolation of the Uropathogens and antibiotic susceptibility testing. Antibiotics safe during pregnancy were tested in the study^[5]. From the graph (Figure 1) it can be noted that UTI is more prevalent in the pregnant women of 22-38 age groups. E.coli was the predominant uropathogen isolated. Klebsiella sp was the second most frequently isolated pathogen followed by Proteus sp., Staphylococcus sp., and Pseudomonas sp. (Figure 2). Almost all Uropathogens were found to be resistant to Ampicillin and amoxicillin (Figure 3). In Current investigation, Nitrofurantoin represented better activity against E.coli, Klebsiella sp. and slight activity against Proteus sp. considering its safety during pregnancy it may be recommended for the treatment. Amoxicillin if given with the inhibitor clavulanic acid might also be an effective drug and might be regarded as safe during pregnancy.

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