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ANTIBIOTIC SUSCEPTIBILITY PATTERN OF MICROBIAL ISOLATES OBTAINED FROM OBSTETRICS PATIENTS IN TERTIARY CARE HOSPITAL IN NORTHERN INDIA.

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ABSTRACT **BACKGROUND:** Urinary tract infections (UTI) are one of the most frequent clinical bacterial infections in women. They are at higher risk to acquire UTI during pregnancy. The emergence and spread of antimicrobial resistance is a cause of increasing concern. Thus, knowledge of local antimicrobial susceptibility patterns of common uropathogens is essential for empiric therapy of UTIs. **MATERIALS AND METHODS:** Retrospective study was conducted in the Department of Microbiology of DRPGMC Kangra at Tanda. Study was conducted for the period of one years ie. from July 2020 to June 202. Urine samples were collected and sent to the laboratory for identification and antimicrobial susceptibility of bacterial isolates. **RESULTS:** During the 12-month study period, out of the 1266 samples screened, 977(77.2%) were sterile, 224(17.698%) samples showed significant growth of >10□CFU/ml and 65(5.1%) were contaminanst or insignificant growth, which were excluded from the study. E. coli alone accounted for 66.9% of the urinary isolates followed by Klebsiella spp 12.9%. Among the Gram-positive cocci, Enterococcus isolated from a single sample and Methicillin resistant staphylococcus aureus were seen in two urine samples. Significantly high susceptibility was seen with fosfomycin(90%) and nitrofurantoin(84%). Resistance was quite high against the norfloxacin(30.3%) and cefazolin(17.8%). **CONCLUSION:** The susceptibility patterns seen in our study seem to suggest that it is necessary to obtain sensitivity reports before initiation of antibiotic therapy in cases of suspected UTI.

KEYWORDS : Pregnancy, Urinary tract infection, Uropathogen, Antimicrobial susceptibility

INTRODUCTION :

UTIs are one of the most frequent clinical bacterial infections in women, accounting for nearly 25% of all infections. [1] Around 50–60% of women will experience a UTI in their lifetime.[2] The estimated number of UTIs per person per year is 0.5 in young females.[3]

Anatomically UTI is classified as upper UTI such as pyelonephritis (infection of the kidney) and lower UTI such as cystitis, urethritis, and prostatitis [4]. Moreover, it can also be grouped as complicated or uncomplicated and/or symptomatic or asymptomatic [5-7].

Females are at higher risk to acquire UTI during pregnancy due to anatomical and physiological changes in pregnancy. [8] If the infection is left untreated, it results in low birth weight, fetus, intrauterine growth retardation, preterm labor, and premature babies, intrauterine fetal death, and increased prenatal mortality and morbidity as well as maternal complications including anemia, preeclampsia, renal failure, septicemia, and adult respiratory syndrome [9].

The emergence and spread of antimicrobial resistance is a cause of increasing concern [10]. It is one of the major causes of failure in the treatment of infectious diseases that result in increased morbidity, mortality, and economic burden [11].Since most UTIs are treated empirically the selection of antimicrobial agent should be determined not only by the most likely pathogen but also by its expected susceptibility pattern. Thus, knowledge of local antimicrobial susceptibility patterns of common uropathogens is essential for empiric therapy of UTIs

Therefore, this study was carried out to determine the most prevalent uropathogens that caused UTI and their antimicrobial susceptibility pattern among obstetrics patients.

MATERIAL AND METHOD:

This retrospective study was conducted in the Department of Microbiology of DRPGMC, Kangra at Tanda. Study was conducted for a duration of 1 year i.e from July 2020 to June 2021.

Samples received in the Department of Microbiology sample were processed on MacConkey agar for 37□ for 18-24 hours and identified by biochemical reactions as per the standard guidelines. Antimicrobial susceptibility was done on Muller hinton agar at 37□ for 18-24 hours. Antibiotics discs were used as per the manufacturer's guideline by himedia. Antibiotics discs used were according to the CLSI guidelines for urinary tract infection.[12]

Only urine culture-positive cases with significant colony count were included in the study. Colony count of >10□CFU/ml was considered significant for the midstream clean-catch sample and urethral catheterised sample respectively. For suprapubic samples, any numbers of pathogens were considered significant [13].

RESULTS:

Totals of 1266 samples were received in the department of Microbiology in the duration of 1 year from July 2020 to June 2021.
Out of 1266 samples 977(77.2%) were sterile, 224(17.7%) showed significant >10 CFU/ml growth of micro organisms and 65(5.1%) showed insignificant growth or growth of contaminants and were excluded from the study. (fig. 1)

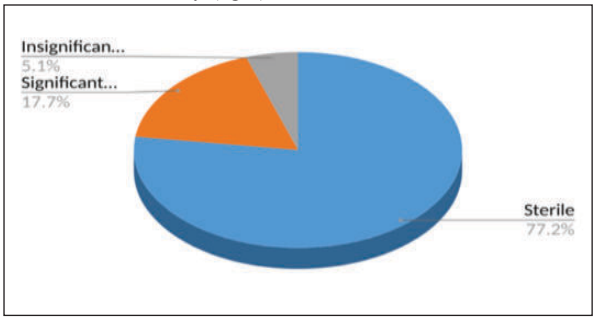

Figure 1: Distribution Of Urine Samples With Growth.

Out of 224 urine samples the most common isolate was Escherichia coli 150(66.9%) followed by Klebsiella pneumoniae 29(12.9%) gram positive isolates were seen in 3 samples with MRSA and enterococcus species. Candida species were isolated from 7 urine samples and given in table 1.

Table 1: Distribution Of Bacterial Isolates Obtained From Urine Samples

SR. No.	Isolate	Number
1	Escherichia coli	150(66.9%)
2	Klebsiella pneumoniae	29(12.9%)
3	Pseudomonas spp	10(4.4%)
4	Acinatobacter spp	10(4.4%)
5	Candida spp	07(3.12%)
6	Non fermenter group of organism	06(2.6%)
7	Citrobacter spp	06(2.6)
8	MRSA	02(0.89%)
9	Enterococcus	01(0.4%)
10	Enterobacter spp	01(0.4%)
11	Proteus	01(0.4%)
12	Providencia spp	01(0.4%)
13	Total	224

Most of the gram negative and gram positive isolates obtained from urinary tract infection samples were susceptible for fosfomycin followed by nitrofurantoin and least susceptibility was seen with cefazolin and norfloxacin. Voriconazole and fluconazole were equally susceptible in infection with candida species.(table 2).

Table 2: Antimicrobial Susceptibility Of Antibiotics To Bacterial Isolates

Antibiotic	E.coli	Klebsiella spp	Pseudomonas spp.	Acinatobacter spp.	MRSA	Total
Fosfomycin	95.3 %	96.5%	30%	60%	100%	90%
Cefazolin	15.3 %	31.0%	-	-	-	17.8 %
Nitrofurantoin	84.5 %	93.1%	70%	70%	50%	84%
Amoxyclav	61.3 %	48.2%	-	-	50%	58.6 %
Cotrimoxazole	42 %	58.6%	-	50%	50%	45%
Norfloxacin	24.6 %	44.8%	30%	20%	50%	30.3 %

Candida spp showed its susceptibility to both voriconazole and fluconazole 71.4% and 85.7% each.

DISCUSSION :

Pregnancy causes both anatomic and physiologic urinary tract changes. While ASB in nongravid women is generally benign, pregnant women with bacteriuria have an increased susceptibility to pyelonephritis.Screening for and treatment of ASB in pregnancy has become a standard of obstetric care and most antenatal guidelines include routine screening for ASB. The present study was conducted to evaluate the prevalence of UTI in pregnant females and to review the drugs that can be used for the treatment of the same. Moreover, the data would also help the authorities to formulate antibiotic prescription policies. Proper investigation and prompt treatment are needed to prevent serious life-threatening conditions and morbidity due to UTI that can occur in pregnant women. [14]

In our study the majority of the urine sample showed growth of Escherichia coli which accounted for 66.9% of the total isolateds. Similarly in studies by Demilie et al and Jindal et al [15,16]which showed the majority of isolates as Escherichia coli with 45.7% and 42.4% respectively. Many studies have shown that microflora from the anorectal region lead to UTI in females due to anatomically small urethra.[8].

Major problem in management of UTI is rising trends of antimicrobial resistance .Though some of the resistance is due to de novo as part of inherited aspect of the bacterias. In this study we looked for the antimicrobial susceptibility to the first line antibiotics by CLSI.

In our study the majority of the bacterial isolates from urinary tract infection showed susceptibility towards Fosfomycin and nitrofurantoin with susceptibility of 90% and 84%. Similarly in studies by Jindal et al and Sabarwal et al showed 100% and 93.2%% susceptibility of nitrofurantoin and nitrofurantoin. [16,17] Resistance was seen in majority with norfloxacin and cefazolin with 30.3% and 17.8%. Similarly, a study by Goettsch et al showed an increased frequency of rising resistance patterns in urinary tract infection[18].

Although our study explored the prevalence of UTI, and antibiotic susceptibility of isolated bacteria from urine, it is not without limitations.

CONCLUSION:

Pregnant women are at risk of serious infectious complications from symptomatic and asymptomatic urinary tract infections. Oral antibiotics are the treatment of choice for asymptomatic bacteriuria and cystitis, while pyelonephritis requires hospital admission and intravenous antibiotics. Antibiotic prophylaxis is indicated in recurrent infection and daily prophylactic antibiotics should be continued for the duration of the pregnancy. Goals for future research include targeting screening and early treatment based on local epidemiology, as well as best preventive measures for recurrent infections.

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