



RESEARCH ARTICLE

UTI IN PREGNANCY - CHALLENGE IN ERA OF ANTIBIOTIC DRUG RESISTANCE

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ABSTRACT

Urinary Tract Infections is one of the most common infections observed in clinical practice especially in pregnant women. This study was conducted on 500 pregnant women to identify the prevalence of symptomatic and asymptomatic UTI, their bacterial profile and antibiogram. A total of 151 pregnant women had significant bacteriuria and 79 of them were symptomatic while 72 were asymptomatic. *E. coli* was the predominant organism sensitive to mainly aminoglycosides like Gentamicin, Amikacin, Nitro furantoin, Amoxiclav. Increasing resistant pattern was observed for Cephalosporins, Ampicillin. The UTI was more prevalent in the third trimester in the patients rather than in the first and second. All the women were also tested for blood glucose levels and 45 of the 500 women were positive for gestational diabetes. But there was no significant difference in the type of bacteria in gestational diabetes mellitus. Neither was there any difference in the symptomatic or asymptomatic bacteriuria among GDM. As untreated cases of UTI in pregnant women may result in severe mortality in the mother and child, it is imperative to diagnose and treat it as early as possible.

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INTRODUCTION

Urinary Tract Infection (UTI) is a common problem in pregnancy due to the morphological and the physiological changes that take place in the genitourinary tract during pregnancy which can be symptomatic or asymptomatic (McNeeley, 1988). The prevalence of UTI in India was reported to be 3.14-19.87% (Andrews, 1990; Rouse et al., 1995; Smaill, 2007). A high prevalence of symptomatic and asymptomatic bacteriuria was found, which was 19.87% and 4.34% respectively (Smaill, 2007). Most of the centers perform a routine analysis of the midstream urine specimen during one or more antenatal visits. However, a full bacteriological analysis is both time-consuming and expensive and a vast majority of the antenatal urine specimens will be negative to the culture (McNeeley, 1988). Screening methods may be useful because a full bacteriological analysis could be reserved for those patients who are symptomatic or those who have a positive screening test results. The upper urinary tract infections in particular, may lead to significant morbidity for both the mother and fetus (Uncu, 2002).

Bacteriuria is a significant risk factor for developing pyelonephritis in pregnancy, leading to adverse obstetric outcomes such as prematurity, low birth weight (Hazhir, 2007), higher foetal mortality rates (Enayat, 2008), and maternal mortality (Little, 1966). Therefore, a proper screening and adequate treatment of UTI during pregnancy is necessary to prevent the UTI complications (Lye, 1992). At least 25% of the women in the rural areas suffer at least one bout of UTI. In spite of this, UTI has not received adequate attention from the preventive perspective, especially in the developing countries. The predominant organisms that cause UTIs during pregnancy are *E. coli* which account for 80 %–90 % of infection (Bandyopadhyay, 2005).

Sample collection

- The midstream cleancatch technique will be used to collect the urine for a sample. The urine will be divided into two parts.
- The first part will be labelled, sealed and stored in a cold environment. These were then transported within half an hour to the microbiology laboratory for urine culture and antibiotic sensitivity testing and will be processed without delay.

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MATERIALS AND METHODS

A total of 500 pregnant women were studied in a period of 6 months in the Umaid hospital, Dr. S.N. Medical college, Jodhpur, Rajasthan. Urine for albumin and glucose levels and clean catch midstream urine for culture and sensitivity was collected from all pregnant women patients. Symptoms for significant bacteria were noted. The urine was transported to the microbiology lab, Umaid hospital for culture and sensitivity. All samples were processed by gram stain method. All the urine samples were inoculated on Hi chrome agar. All the positive samples were identified by biochemical reactions as per CLSI guideline. Significant bacteria of $>10^5$ colonies were taken into consideration. These were further subjected to antibiotic sensitivity test on Muller Hinton agar using Imipenem, Fosfomycin, ampicillin, amoxiclav, ceftazidime, cefepime, gentamycin, nitrofurantoin by Kirby Bauer's disk diffusion method, as per CLSI guideline.

RESULTS

In study time urine samples were received from gynaecology department of Umaid hospital. In study time from December 2017 to May 2018 250 samples of symptomatic bacteria and 250 samples of asymptomatic bacteria were processed for semiquantitative urine culture, microscopic examination and all the samples urine albumin and sugar detection was done by screening method using commercial plates. Out of symptomatic bacteria samples in 154 samples there was no growth (%). 18(%) was collection contamination has more than 2 colonies on culture plate as these patient were advised to repeat sample. Out of 78 (%) culture positive samples. 35 (%) were gram positive cocci, 39(%) were gram negative bacilli, 4 (%) were yeast bodies. Out of 35, 11 were *coagulase negative staphylococcus* (%), 16 were *staphylococcus aureus* (%), 8 were *enterococci* (%). Out of 39 gram negative bacilli, lactose fermenter (*E.coli*, *Klebsiella*) were 35(89.75%) & non lactose fermenter (*Acinetobacter*, *proteus*) were 2 (0.02%).

Table 1. Distribution of cases in symptomatic and asymptomatic UTI cases in study duration

Result of Culture	Symptomatic (total = 250)		Asymptomatic (total = 250)		total cases =500	
	n	%	n	%	n	%
Significant bacteria	79	31.6	72	28.8	151	30.2
Insignificant bacteria	23	9.2	30	12	53	10.6
Contamination	16	6.4	36	14.4	52	10.4
Sterile	132	52.8	112	44.8	244	48.8
Total	250	100	250	100	500	100

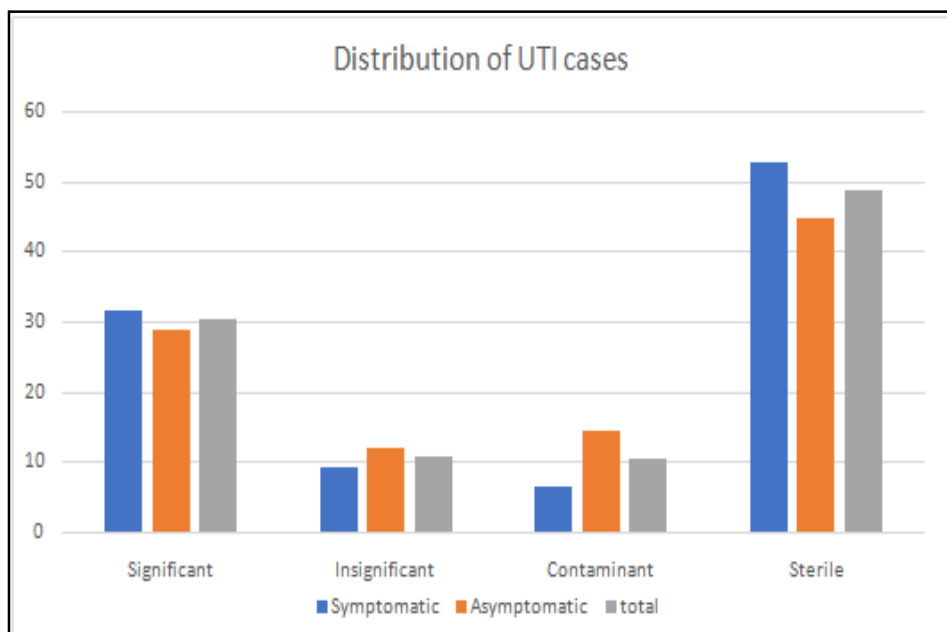


Table 2. Distribution of bacteria isolates recovered from urine samples

Isolates	Symptomatic		Asymptomatic		Total Isolates (%)	
<i>Escherichia coli</i>	32	40.5	23	31.94	55	36.42
<i>Klebsiella sp.</i>	3	3.79	4	5.55	7	4.63
<i>Citrobacter sp.</i>	2	2.5	0	2.77	2	1.32
<i>Proteus sp.</i>	1	1.2	0	00	1	0.66
<i>Acinetobacter</i>	1	1.2	1	1.38	2	1.32
<i>Staph. aureus</i>	16	20.25	12	16.66	28	18.54
CONS	11	13.92	15	20.83	26	17.21
Enterococci	9	11.39	17	23.61	26	17.21
<i>Candida sp.</i>	4	5.06	0	00	4	2.64
Total	79		72		151	

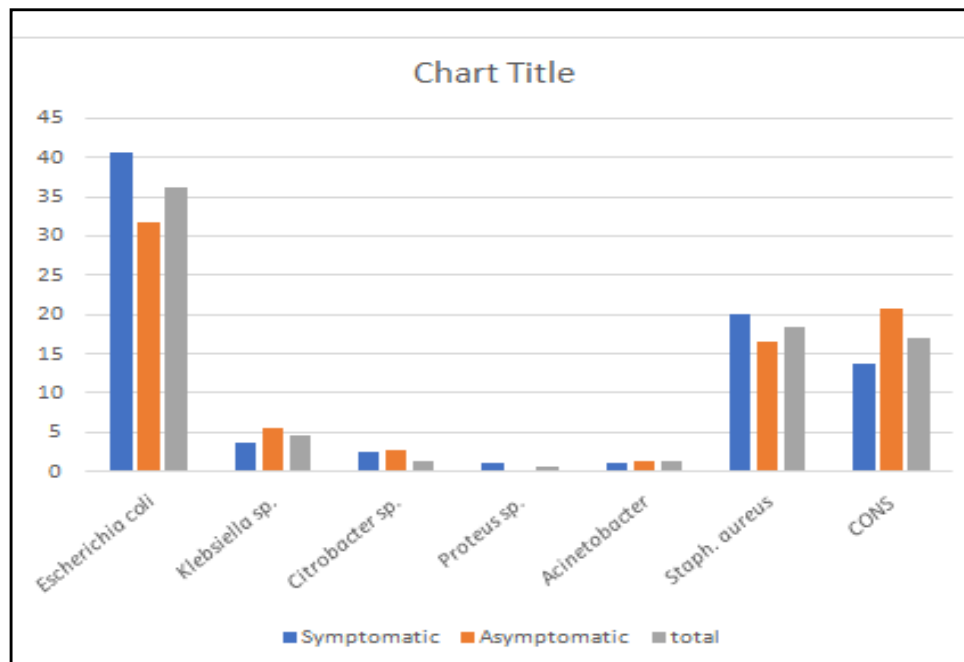


Table 3. Antibigram of gram negative organism (sensitive)

Antibiotics	Symptomatic isolates		Asymptomatic isolates	
Meropenam	32/39	82.05%	23/28	82.14
Fosfomycin	20/39	51.28	15/28	53.57
Ampicillin	10/39	25.64	6/28	21.42
Amoxiclav	10/39	25.64	5/28	17.85
Ceftazidime	32/39	82.05	21/28	75.00
Cefepime	30/39	76.92	19/28	67.85
Gentamycin	31/39	79.48	26/28	92.85
Nitrofurantoin	30/39	76.92	27/28	96.42

Table 4. Antibigram of gram positive organism

Antibiotics	Symptomatic isolates		Asymptomatic isolates	
Meropenam	35/36	97.22	38/44	86.36
Fosfomycin	31/36	86.11	36/44	81.81
Ampicillin	24/36	66.66	15/44	34.09
Amoxiclav	24/36	66.66	12/44	27.27
Ceftazidime	34/36	94.44	31/44	70.45
Cefepime	35/36	97.22	34/44	77.27
Gentamycin	35/36	97.22	36/44	81.81
Nitrofurantoin	36/36	100	40/44	90.90

Out of 39 lactose fermenter 32 were *Esch. coli* (82.05%), 3 were *Klebsiella sp.* Out of 2 non lactose fermenter 1 were *proteus* and *Acinetobacter* each. In antibiotic sensitivity done by disk diffusion methods using CLSI guideline 2016 be tested Meropenam, Fosfomycin, Nitrofurantoin, Ciprofloxacin, Ampicillin, Amoxyclav, Gentamycin, Ceftazidime, Cefepime, were tested and meropenem resistance was seen in 8 cases out of 74, Fosfomycin resistance were seen 25 and nitrofurantoin resistance was seen in 10 cases, gentamycin was seen in 9, ceftazidime was seen in 9, Amoxicillin and amoxiclav resistance was seen in 41 cases.

DISCUSSION

UTI occurs at any age and in any sex, but more so in pregnant women, probably due to physiological and hormonal changes. During pregnancy, the chemical composition of urine is also affected and results in increased urinary substances eg, glucose and amino acids which may facilitate bacterial growth in urine.

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