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Original Research Article

Detection of Urinary Tract Infection among Pregnant Women in a Tertiary Care Hospital

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ABSTRACT

Aim: To detect the presence of urinary tract infection among pregnant women and to identify the pathogens responsible for it.
Methods: A cross sectional study was carried out over a period of six months. A total number of 200 clean voided mid stream urine samples were collected from pregnant women with or without symptoms of urinary tract infection. With the help of predesigned questionnaire, socio demographic data were collected.
Results: Out of 200 pregnant women, 34% of them had urinary tract infection. It is mostly observed in pregnant women age of 20-30 years, multiparity and during third trimester of pregnancy. Majority of them belong to low socioeconomic status, uneducated and had past history of urinary tract infection. The commonest causative organism was found to be Escherichia coli 79.4% followed by Klebsiella 10.29%, Staph aureus 5.88% and Proteus 4.41%.
Conclusion: The incidence rate of urinary tract infection during pregnancy is high. So it is important to do routine screening of all pregnant women for significant bacteriuria to reduce the adverse effects on both maternal and fetal health.

Key words: Urinary tract infection, pregnant women, bacteriuria

INTRODUCTION

Urinary tract infection (UTI) is, defined by the Infectious Diseases Society of America (IDSA, 2005) guidelines as two consecutive clean-catch voided urine specimens with isolation of the same organism in quantitative counts of $\geq 10^5$ cfu/mL or as more than 100 organisms per ml of urine with accompanying pyuria (more than 5 white blood cells per ml) in a symptomatic patients. [(1)] Symptomatic and asymptomatic bacteriuria have been reported 17.9% and 13% among pregnant women respectively.[(2)] Untreated asymptomatic bacteriuria is a risk factor for acute cystitis 40% and pyelonephritis 25-30% in pregnant women. [(3)]

The clinical manifestation of UTI depend upon the portion of urinary tract involved, etiological organism, the severity of infection and patient's ability to mount and immune response to it. [(4)] Sign and

symptoms include fever, dysuria, urinary urgency, cloudy and malodorous urine.

UTI usually caused by gram negative bacteria like Escherichia coli, Klebsiella spp, Proteus mirabilis, Pseudomonas aeruginosa, Acinetobacter spp and Serratia spp and gram positive bacteria such as Enterococcus spp and Staphylococcus species. [5-7]

During pregnancy due to compression of ureters by gravid uterus lead to stasis of urine. Ureteral peristalsis and bladder tone also reduce in pregnancy. Vesico-t reflux, history of recurrent UTI, diabetes mellitus, hyperuricaemia also are important predisposing factor for UTI. [8-10]

UTI during pregnancy contributes significantly to maternal and perinatal morbidity. [11] Abortion, maternal anemia, hypertension, preterm labour, phlebitis, thrombosis and chronic pyelonephritis and fetal complications like intra uterine growth retardation, acute respiratory distress and prematurity are related to urinary tract infection during pregnancy. [12]

The aim of the study is to detection and distribution of UTI in relation to age, parity and gestational age of pregnant women and identification of uropathogens and their antibiotic sensitivity pattern for effective treatment.

MATERIALS AND METHODS

Total 200 pregnant women of different trimester with or without symptoms of UTI were included in this study. Women with known case of renal disease or who is on antibiotic therapy were excluded. Verbal informed consent was taken. With the help of predesigned questionnaire, socio-demographic data were collected.

Along with the routine blood examination, mid stream urine for microscopical analysis and culture and sensitivity were sent. Urine was cultured on blood agar and Mac conkey agar media. After overnight incubation at 37^0C for 24 hours on culture plate, if bacterial counts equal or more than 10^5per ml were taken as positive in both symptomatic and asymptomatic women. The bacteria isolates were identified on the basis of colony morphological characteristics, gram stain reaction and biochemical test. Centrifuged urine deposits were microscopically examined for pus cells, red blood cells, epithelial cells, cyst, crystals and yeast like cells. Pus cells >5/HPF were considered significant for infection.

RESULTS

Out of 200 urine samples, 34% had shown significant growth. Table 1 shows the incidence of UTI in relation to age. Highest incidence of infection was seen in pregnant women of age 26-30 years followed by 21-25 years of age group. Lowest incidence was noticed in 36-40 years age group.

Table 1: Incidence of UTI in relation to age of pregnant women.

Age (years)	No. examined	No. positive	Percentage (%)
≤ 20	14	9	13.23
21-25	77	17	25
26-30	80	26	38.23
31-35	18	12	17.64
36-40	11	4	5.88

Distribution of UTI in relation to parity is shown in table 2. Those women who were grand multigravida, the incidence of UTI was more common than that of primigravida and multigravida.

Table 2: Incidence of UTI in relation to parity.

Parity	No. examined	No. positive	Percentage (%)
0-1	82	23	33.82
2-4	78	14	20.58
>4	42	31	45.58

Table 3 shows incidence of UTI in relation to gestational age. In this study,

observed that highest incidence of UTI had in third trimester of their pregnancy and least incidence of infection was seen in first trimester of pregnancy.

Table 3: Incidence of UTI in relation to gestational age

Gestational age (weeks)	No. examined	No. positive	Percentage (%)
1-12	32	14	20.58
13-28	44	16	23.52
29-40	124	38	55.88

Various factors which were related with UTI are shown in table 4. Those women who had UTI, 88% of them were uneducated and 72% were belonging to low socioeconomic status. Pregnant women with past history of UTI were one of the most important risk factors, as 64% of them had past history of UTI in our study.

Table 4: Frequency of UTI in relation to other factors

Factor		Percentage of Bacteriuria (%)
Status	High	28
	Low	72
Education	Educated	12
	Uneducated	88
Past history of UTI	Present	64
	Absent	36

To detect bacteriuria in pregnancy, urine culture is the best investigation of choice. Table 5 shows frequency of occurrence of different pathogens. In our study, it was noticed that most common pathogen for UTI was Escherichia coli, which constitute 78% followed by Klebsiella 10.29%, Staph aureus 5.88% and Proteus 4.41%.

Table 5: Various pathogens in urine samples

Pathogen	No. examined	Percentage (%)
E.coli	54	79.41
Klebsiella	7	10.29
Staph. aureus	4	5.88
Proteus	3	4.41

Table 6 shows, antibiotic sensitivity pattern of isolated bacteria. The result of the antibiotic susceptibility tests showed that all the isolated bacteria were highly sensitive to Nitrofurantoin followed by Ciprofloxacin, Amikacin, Cefotaxime, Ceftriaxone and Amoxy-Clav.

Table 6: Pattern of Antibiotic sensitivity

Drugs	% of sensitivity
Nitrofurantoin	80
Ciprofloxacin	54
Amikacin	49.57
Cefotaxime	42.36
Ceftriaxone	41
Amoxy-Clav	28

DISCUSSION

Urinary tract infections are common in pregnancy. In this study, the incidence rate of UTI in pregnancy was 34% and it may be due to less water intake because of cold weather in this region. The finding of this study is higher than the findings found by Aiyegoro et al and Olowu et al where the incidence of UTI among pregnant women were 11.9% and 28.1%. [13,14] In contrast another two studies by Onifade et al Mbata et al where the incidence rate of UTI were 58% and 71.6%,which were higher than this present study. [15,16]

The highest incidence of UTI in pregnant women was seen in 26-30 years of age. Nearly similar result was noticed by Stanley et al where 27-32years of age group women commonly had UTI, while another study by Kawser et al shows that UTI was mostly observed in 20-25 years of age. [17,1]

In our study grand multigravida had higher incidence rate of UTI than that of primigravida. Similar result was seen in study conducted by Okonko et al, while according to Stanley et al UTI in pregnancy was mostly noticed in multigravida who had 1-4 children than that of grand multigravida, who had >4 children. [18,17]

Higher incidence of UTI in pregnancy was noticed in third trimester

followed by second and first trimester. This finding was similar with Leigh et al, who reported an increase frequency of UTI in the third trimester in comparison to first and second trimester of pregnancy while Onuh et al reported a high prevalence of UTI in second trimester in comparison to first and third trimester. [19,12]

The present study shows, pregnant women who were uneducated, belong to low socio-economic status and not maintaining their perineal hygiene, incidence rate of UTI was higher. The Dimetry et al and Amiri et al also shows that pregnant women with low socioeconomic status, not cleaning genital before and after coitus, not voiding urine post coitus and washing genital from back to front have observed as risk factors for UTI. [20,21]

The women who had past history of UTI have significant risk factor for recurrence. In this study 64% of pregnant women had past history of UTI. Similar result also noticed by Gulfreen et al where prevalence of bacteriuria was 100% in women who had previous history of UTI. [22] Nitrofurantoin is the most commonly prescribed antibiotic for the empirical therapy of UTI because sensitivity of this antibiotic is 80%. According to Stanley et al, the isolate d bacteria were highly susceptible to Gentamycin, Ciprofloxacin, Tetracycline and Erythromycin. [17] Similar observations were made by Adedeji and Abdulkadir et al, where Gram negative bacteria have the highest sensitivity to Gentamycin and Ciprofloxacin. [23]

CONCLUSION

Due to physiological changes UTI is common in pregnant women. E. coli is the commonest pathogen for UTI. Low socioeconomic status, grand multiparity and had past history were the risk factors for UTI so it is important to screen all pregnant women for UTI, identify the pathogens, their sensitivity to antibiotics and treat accordingly to reduce feto-maternal morbidity.

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