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Original Research Paper

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PREVALENCE OF ASYMPTOMATIC BACTERIURIA IN PREGNANT WOMEN ATTENDING ANTENATAL CLINICS OF GMC, KOTA

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ABSTRACT

INTRODUCTION: Asymptomatic bacteriuria is the significant presence of bacteria in the urine of an individual without symptoms. In pregnancy, various actors including the apparent reduction in immunity,tends to encourage the growth of pathogens.

AIMS AND OBJECTIVES: To determine the prevalence of ASB in pregnancy ,to identify the causative organism & to find out the antibiotic susceptibility pattern of isolates.

MATERIALS AND METHOD: A total of 300 pregnant women were recruited for this study. All subjects were clinically identified to have no signs and symptoms of UTI. Clean catch midstream urine sample was collected from each patient into sterile universal container. The urine samples were examined microscopically and by cultural method. Identification of isolates was done by standard microbiological technique and subjected to antibiotic sensitivity testing by Kirby Bauer's disc diffusion method.

OBSERVATION & RESULT: A total of 24 (8.0%) were positive for significant bacteriuria. The prevalence was found to be higher in the 20-24 years age group, primigravidas & in 3rd trimester pregnant women. Maximum (70.83%) study subjects belonged to low socioeconomic group. There was a significant association between significant bacteriuria and education level. Escherichia coli was the most predominant organism followed closely by Staphylococcus aureus.83.33% of different isolates were sensitive to amikacin ,followed by Ciprofloxacin & Cephalexin.

KEYWORDS : Asymptomatic bacteriuria(ASB), Colony forming units(cfu), Urinary tract infection (UTI)

INTRODUCTION

Asymptomatic bacteriuria(ASB) is defined as the presence of >105 cfu of a single bacterial species per ml of urine, cultured from midstream sample in the absence of symptoms1. The prevalence varies form 2-10%2. ASB patients are more likely to develop acute pyelonephritis, anemia , prematurity, low birth weight babies, and prenatal death if untreated.8 Predisposing factors for ASB in pregnancy include urinary stasis due to progesterone effect and pressure effect of enlarging foetus, ureterovesical reflux due to decreased ureteral tone, glycosuria and apparent reduction in immunity of pregnant women.2 E.coli accounts for 80-90%of infections. Other bacteria such as Klebsiella pneumonia, Proteus mirabilis & Staphylococcus sp. are also common.3 Therefore an early detection and treatment of ASB may be of considerable importance in reducing the mortality and morbidity in mother and offspring.

MATERIALS AND METHOD

Study population & sample size : 300 Pregnant women visiting the antenatal clinic of the department of Obstetrics and Gynaecology in JK Lon & NMCH Hospital of GMC,KOTA. Period of study : From November 2016 to october 2017

Inclusion Criteria:

- All pregnant women without symptoms of UTI (dysuria, frequency & urgency)
- Pregnant women without antibiotic treatment in previous two weeks (for any Cause).

Exclusion criteria:

- Patients with symptoms of UTI. Symptoms suggestive of infections in urinary tract (dysuria, frequency & urgency) are not included in study.
- History of antibiotic therapy in previous two weeks
- Known congenital anomalies of urinary tract.

Specimen collection and processing: Clean-catch midstream urine was collected from each patient into a sterile universal container. For Semi-quantitative culture, a loopful of well mixed uncentrifuged urine was streaked using a calibrated loop on MacConkey agar and Blood agar plates. After incubating aerobically for 24hrs at 37o C, colony forming unit (cfu) per milliliter of urine was calculated. Colony counts yielding bacterial growth of 105 or more of pure isolates were deemed significant. Similarly, 10ml of each patient urine was transferred into sterile centrifuge tubes and then centrifuged at 3000rpm for 5 minutes. The supernatant was discarded and the deposit examined microscopically at high magnification for pus cells, red blood cells, epithelial cells, casts, crystals, yeast-like cells and Trichomonas vaginalis. Pus cells > 5 per high power field were also considered significant for infection. The isolated organisms from culture plates were furthur identified by gram's staining & various biochemical tests4. Antimicrobial in-vitro susceptibility testing was performed using Kirby Bauer's disc diffusion method. Statistical analysis was performed by the chi-square (χ) test. A P-value of < 0.05 was deemed statistically significant.

OBSERVATION & RESULT: Out of 300 pregnant women examined for asymptomatic bacteriuria, 24 were positive for significant bacteriuria, giving a prevalence of 8.0%. The prevalence was found to be higher in the 20-24 years age group (Table 1),3rd trimester(Table 2) & in primigravidas (Table 3) & maximum (70.83%) study subjects belonged to low socioeconomic group. There was a significant association between significant bacteriuria and education level. E.coli was the predominant organism isolated (50%) (Table 4).The drug sensitivity pattern revealed that 83.33% of different isolates were sensitive to amikacin , followed by ciprofloxacin (79.16%) and cephalexin (61.9%). The sensitivity to drugs, which are routinely used to treat asymptomatic bacteriuria such as amoxicillin , gentamicin and nalidixic acid, were found to be less sensitive in the study. (Table 5).

DISCUSSION

Prevalence of asymptomatic bacteriuria (ASB) was 8.0% (24/300). This lies within the reported range of 3-10%.5Lavanya et al (2002) and Mathew et al (1998) reported a prevalence of 8.4%and 6.8% in their studies conducted individually at AIIMS, Delhi and Christian Medical College,Vellore respectively.6,7 But variable results were observed by Rizk et al (2001) & Ananthi Kasinathan et al8 with a prevalence of 4.2% & 12.6% respectively. This may be due to the difference in study population or selection criteria for asymptomatic pregnant women. In our study, the prevalence was seen to be higher in women belonging to the 20-24 years of age group.Similar results have been reported by Lavanya et al (2002) 6 and Hazhir S (2007).9 This may be explained by the fact that this age group is sexually active & sexual intercourse had strong association with asymptomatic bacteriuria since it facilitates the introduction of bacteria.

The prevalence was seen to be higher in third trimester. It is because urinary stasis increases with advancing pregnancy and thus the incidence of bacteriuria would be expected to increase in the last trimester. Similar results were observed by Tugrul et al (2005) where ASB distribution in the first, second and third trimesters were 0.9%, 1.83% and 5.6% respectively.10Although in studies By Chandel Lata R et al 11 higher rates of infection was observed in first trimester. Study showed significance of previous history of UTI as a risk factor for significant bacteriuria. 58% of the pregnant women gave history of previous urinary tract infection. Similar results were shown by Al-Sibai et al (1989)12 (45.8%) & Sescon et al, 2003)13 (42%).

Comparing socioeconomic status 70.83% of the positive cases belong to low socioeconomic status .This may be due to poor personal hygiene and lack of basic amenities seen amongst the low socioeconomic class of patients. Similar trend was noted by Ananthi Kasinathan et al (2015)8, Kanpur.In our study, the prevalence was seen to be higher in primigravidas (45.8%). Similar result has been reported by Lavanya et al (2002).6 Conversely R.Sujatha et al 14, reported that the higher incidence of bacteriruia was found among the multiparae. The higher incidence in primigravida can be explained by the fact that physiological and anatomical changes are more marked in primigravida.

In the present study, the predominant pathogen isolated was E.Coli (50%). It might be explained by its high affinity to adhere in the uroepithelial cells due to the presence of different virulence factors. This may also be attributed due to poor genital hygienic practices by pregnant women who may find it difficult to clean their anus properly after defecating or clean their genital after passing urine. Thus promoting colonisation by fecal flora colonising the periurethral area .(predominantly E.coli).Similar results were seen by Lavanya et al (2002).

6 while O.A.F Ilusanya et al , Nigeria (2012)15 reported staphylococcus aureus as predominant organism. This variation may be attributed due to factors such as geographical variation, ethnicity of subjects, diagnostic methods used etc.The results of drug sensitivity revealed that 83.33% of isolates of different bacterial species were sensitive to amikacin followed by ciprofloxacin (79.16%) and cephalexin (61.9%). We found that the sensitivities of nitrofurantoin (41.66%) cotrimoxazole (33.34%), gentamicin (33.20%), amoxycillin (20.05%) and nalidixic acid (12.5%) which are used as drugs of choice in treating asymptomatic bacteriuria during pregnancy were comparatively lower and thus posing problems in treating these patients.

All gram-positive bacteria isolated were 100% resistant to amoxycillin; this can be overcome by combining it with beta lactamase inhibitors like clavulinic acid or sulbactum, which are resistant to some of beta-lactamases produced by bacteria.16
E. coli, which was predominant Gram-negative organism, isolated showed sensitivity pattern of amikacin (83.33%), ciprofloxacin and nitrofurantoin (66.67)%, cephalexin (58.33)%, cotrimoxazole (41.66)%, gentamicin (25%), amoxycillin (25%) and nalidixic acid (16.67%).

CONCLUSION & RECOMMENDATIONS : There is need for early routine screening of all antenatal patients whether symptomatic or asymptomatic & should be treated with appropriate antibiotic, thus to prevent adverse maternal and neonatal outcome. Proper routine bacterial culture should be carried out by clinicians of all antenatal patients. The susceptibility pattern of uropathogens should be carried out & rational use of antibiotics should be encouraged to prevent the emergence of MDR strains. Ciprofloxacin and amikacin are good alternatives for the treatment of significant bacteriuria in pregnancy.

Table 1: Prevalance of ASB in relation to age distribution of pregnant women

Age group (yrs)	No of Samples	No. Positive (%)
20-24	122	11(45.83)
25-29	102	9(37.5)
30-34	58	3(12.5)
35-39	13	1(4.17)
Above 39	5	0
Total	300	24 (100)

Table 2: Prevalence of ASB by trimester

No.of Pregnancy (Parity)	Positive (%)
Para 0	11(45.8)
Para 1-3	8 (33.4)
Para>3	5 (20.8)
Total	24(100)

Table 3 :Prevalence of significant bacteriuria per parity (No. of pregnancy)

Gestation period	Significant bacteriuria (%)
First trimester	4 (17)
Second trimester	8 (33)
Third trimester	12 (50)
Total	24(100

Table 4. Distribution of isolates in the urine samples using standard biochemical tests

ISOLATES	NUMBER	PERCENTAGE (%)
Escherichia coli	12	50
Staphylococcus aureus	3	12.5
Klebsiella pneumonia	3	12.5
Proteus mirabilis	2	8.4
Enterococcus sp	2	8.4
Pseudomonas sp.	1	4.1
CONS	1	4.1
Total	24	100

Table 5 : Antibiogram (Sensitivity)

Antibiotics	No. of cases	Percentage
Amoxycillin	5	20.83
Amikacin	20	83.33
Cephalexin	13	54.16
Ciprofloxacin	19	79.16
Gentamicin	8	33.33
Nitrofurantoin	10	41.66
Nalidixic acid	3	12.50
Cotrimoxazole	8	33.34

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