



DIAGNOSIS AND MANAGEMENT OF ASYMPTOMATIC BACTERIURIA IN PREGNANCY

Microbiology

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ABSTRACT

UTI is common during pregnancy. It can be either asymptomatic or symptomatic. This study was done on 175 asymptomatic pregnant women. Clean catch midstream sample was collected in a sterile container and was subjected to microscopy and culture on MacConkey and CLED medium using a calibrated loop and subsequently incubated at 37 °C. Antibiotic sensitivity test was done on nutrient agar on the basis of zone of inhibition. Pyuria was found in 26.85% women. Prevalence rate was found to be 7.42% in our study. *E. coli* was the commonest pathogen isolated, followed by *Klebsiella* species, *Coagulase negative Staphylococcus*, *Staphylococcus aureus*, *Proteus* species. Different antibiotics showed varied zone of inhibition. Amikacin, Meropenem and Nitrofurantoin were found to be most effective antibiotics in treatment of UTI. Proper education and proper hygiene is important to eradicate bacteriuria.

KEYWORDS

UTI, Asymptomatic, Pregnancy, Bacteriuria.

INTRODUCTION-

Urinary tract infection associated with pregnancy is a common condition encountered in obstetrical practice which can be symptomatic or asymptomatic. A colony count of 10^5 in urine samples of asymptomatic pregnant women is taken as significant growth. Approximately 30 percent of pregnant women with asymptomatic bacteriuria will develop symptomatic cystitis and 50 percent will develop pyelonephritis and may lead to low birth weight infants or pre term birth, if not treated^{1,2,3}. Hence timely and proper diagnosis and treatment is of paramount importance to avoid maternal and infant complications. The commonest organism isolated is *E. coli*, *Klebsiella*, *Proteus*, *Coagulase negative Staphylococci* and *Pseudomonas*^{4,5,6,7,8}.

The reported prevalence rate of asymptomatic bacteriuria is in the range of 2 -11%⁹. Semiquantitative urine culture of mid stream urinary sample is the gold standard for the diagnosis of bacteriuria. It has been found that antibiotic treatment reduces the incidence of adverse perinatal outcomes and various maternal complications¹⁰.

MATERIALS AND METHODS-

A total of 175 asymptomatic pregnant women were studied. Clean catch midstream sample was collected in a sterile container and was subjected to microscopy and culture on MacConkey and CLED medium using a calibrated loop and subsequently incubated at 37 °Celsius. For organism identification, morphological characteristics, Gram's staining, motility test and different biochemical test like catalase test, oxidase test, Coagulase test, MRVP test, indole test etc was carried out on the sample. Antibiotic sensitivity test was done on nutrient agar and Muller-Hinton agar plate.

RESULTS-

Urine microscopy – Pyuria was found in 47 samples (26.85%) out of 175 samples studied and remaining 128 (73.14%) were negative for pyuria.

Table 1- Urine microscopy test

Microscopy	Number	Percentage
Positive	47	26.85%

Negative	128	73.14%
Total	175	100%

Culture findings of ASB cases- 7.42% i.e. 13 samples were found to be positive on culture in total sample size of 175 and rest 92.58% (162) samples were culture negative.

Table 2- Culture findings for ASB

Culture type	Number	Percentage
Positive	13	7.42%
Negative	162	92.58%
Total	175	100%

Pathogens isolated- *E. coli* was the commonest pathogen isolated 7 (53.84%), followed by *Klebsiella* species 2 (15.38%), *Coagulase negative Staphylococcus* 2 (15.38%), *Staphylococcus aureus* 1 (7.69%), *Proteus* species 1 (7.69%).

Table 3- Number of Pathogens isolated

Pathogen isolated	Number of cases	Percentage
<i>E. coli</i>	7	53.84%
<i>Klebsiella species</i>	2	15.38%
<i>Coagulase negative staphylococcus</i>	2	15.38%
<i>Staphylococcus aureus</i>	1	7.69%
<i>Proteus species</i>	1	7.69%

Antibiotic sensitivity- Different antibiotics were tested against the bacterial isolates like Ampicillin, Amikacin, Cotrimoxazole, Cephalixin, Meropenem, Nitrofurantoin each with 10mcg concentration. Antibiotic sensitivity was tested on the basis of zone of inhibition and was characterized into three types as sensitive, intermediate and resistant. *E. coli* showed maximum sensitivity against Amikacin and Ceftriaxone with 20mm zone of inhibition. *Klebsiella* showed sensitivity against Ceftriaxone with 22 mm zone of inhibition. *Coagulase negative Staphylococcus* and *Staphylococcus aureus* showed maximum sensitivity against Nitrofurantoin with 17mm and 19mm zone of inhibition respectively. Ampicillin and Meropenem showed maximum sensitivity against *Proteus* species with 18mm zone of inhibition.

Table 4 - Effects of antibiotics against the bacterial isolate

Bacterial Isolate	Antibiotics											
	Ampicillin (10 mcg)		Amikacin (10 mcg)		Cotrimoxazole (10 mcg)		Cephalixin (10 mcg)		Ceftriaxone (10 mcg)		Meropenem (10 mcg)	
	ZI	INP	ZI	INP	ZI	INP	ZI	INP	ZI	INP	ZI	INP
<i>E. coli</i> (7)	14	I	20	S	17	S	15	I	20	I	19	S
<i>Klebsiella species</i> (2)	Nil	R	15	I	12	I	15	I	22	S	17	S
<i>Coagulase negative Staphylococcus</i> (2)	14	I	Nil	R	11	I	14	I	15	I	16	S
<i>Staphylococcus aureus</i> (1)	Nil	R	15	I	13	I	18	S	18	I	17	S
<i>Proteus species</i> (1)	18	S	17	S	11	I	Nil	R	Nil	R	18	S

Where, ZI= Average Zone of Inhibition, INP= Interpretation, S= Sensitive, I= Intermediate, R= Resistant

DISCUSSION-

Prevalence rate of 7.42% was found in study of asymptomatic bacteriuria during pregnancy which is within the reported range of 3-10% in studies carried out by different researchers. Lavanya et al, 2002 in a study at AIIMS New Delhi found a prevalence rate of 8.4%⁴, Mathew et al, 1998 from Christian medical College, Vellore reported prevalence of 6.8%¹¹. Studies conducted in different countries like, Etopia (1998), USA (2000), Malaysia (2002), Turkey (2005), Iran (2007) showed a prevalence of 3-10%^{12,13,14,15,16}.

Microscopy for bacterial identification was positive in 26.85% of cases which is in line with findings of other studies.

In the present study the commonest organism isolated was *E.coli* (53.84%) followed by *Klebsiella* species and CONS (15.38%) each and *Staphylococcus aureus* and *Proteus* species (7.69%) each. Gayanthri et al from Karnataka found *E.coli* to be the commonest organism isolated in samples from asymptomatic pregnant women (51.6%) and *Staphylococcus* and *Klebsiella* in 9.6% of cases¹⁷. Nithya sree et al, from Tamil Nadu isolated *E.coli* in 65.11% followed by *Klebsiella* and *Staphylococcus aureus* in 11.62% cases in her study¹⁸. Khaya Mukherjee et al, reported 57.14% reported *E.coli* isolation in samples¹⁹.

Antibiotic sensitivity tests carried out against different bacterial isolates. *E.coli* showed maximum sensitivity against Amikacin and Ceftriaxone with 20mm zone of inhibition. *Klebsiella* showed sensitivity against Ceftriaxone with 22 mm zone of inhibition. *Coagulase negative Staphylococcus* and *Staphylococcus aureus* showed maximum sensitivity against Nitrofurantoin with 17mm and 19mm zone of inhibition respectively. Ampicillin and Meropenem showed maximum sensitivity against *Proteus* species with 18mm zone of inhibition. This finding is almost similar to findings of Anu Mary Bose et al from Kerala²⁰.

CONCLUSION-

This study was done on 175 asymptomatic pregnant women. *E.coli* was the commonest organism isolated in our study. Screening and culture tests should be done at first antenatal visit to detect UTI. Treatment should be done on the basis of antibiotic sensitivity test only. Proper education and proper hygiene is important to eradicate bacteriuria.

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