

## HOSPITAL BASED STUDY FOR ASYMPTOMATIC BACTERIURIA IN PREGNANT WOMEN

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**BACKGROUND:** Asymptomatic bacteriuria (ASB) is infection in pregnancy which requires medical treatment. If left untreated, may lead to prematurity, intrauterine death and pyelonephritis. The diagnosis is done by culture and its antibiotic sensitivity helped the women in treatment. **AIMS & OBJECTIVE:** The study was done to determine the asymptomatic bacteriuria during pregnancy by culture and also its antibiotic sensitivity. **METHODS & MATERIALS:** This study was done on 196 pregnant women. The specimens were analyzed by pyuria, catalase test, nitrate reduction test, culture and sensitivity test. **RESULTS:** Out of 196 pregnant women, 22 showed positive culture growth and culture was the effective method in screening. The prevalence of asymptomatic bacteriuria increased with age. Escherichia coli was the commonest organism isolated. The isolated organisms showed increased sensitivity to amikacin and lowest sensitivity to ampicillin. **CONCLUSION:** Asymptomatic bacteriuria is a common problem in pregnant women which requires diagnosis and treatment. The diagnosis may lead to reduction of the adverse effect in pregnancy.

**INTRODUCTION:** Urinary tract infection (UTI) affects women particularly pregnant women more than men due to short urethra, pregnancy, easy contamination of urinary tract with fecal flora.<sup>[1]</sup> Profound physiological and anatomic changes in the urinary tract during pregnancy contribute to the increased risk for infection. Asymptomatic bacteriuria (ASB) is defined as pure cultures of at least 10<sup>5</sup> organisms/ml of urine in the absence of symptoms.<sup>[2]</sup> Asymptomatic bacteriuria may lead to acute pyelonephritis, postpartum UTI, hypertensive disease, anemia, prematurity and low birth weight babies if left untreated in pregnant women. A prevalence of 2-10 percent has been reported.<sup>[3][4]</sup> Escherichia coli is the most common organism associated with bacteriuria.<sup>[5]</sup> Specific virulence factors in uropathogenic strains of E.coli may be helpful for adherence to uroepithelial cells tissue invasion such as toxins and adhesins, pili or fimbriae.<sup>[6]</sup>

Urine culture is the gold standard screening technique for asymptomatic bacteriuria during pregnancy.<sup>[7]</sup> Therefore, if routine screening for asymptomatic bacteriuria and its treatment is done, the development of chronic renal disease in pregnant women and fetal loss due to complication of urinary tract infections may be reduced.<sup>[8]</sup> The present study was done to determine the prevalence of asymptomatic bacteriuria among pregnant women attending out patient department.

**MATERIAL AND METHOD:** This study was conducted in Microbiology department during 1<sup>st</sup> May 2011 to 30 April 2012. 196 women in their first, second or third trimesters of pregnancy were included for the study. Cases from outpatients enrolled for the study. Pregnant woman with history of fever with chills, genito urinary complaints, pregnancy induced hypertension and also patients on antibiotic treatment during the pregnancy were excluded. Pregnant women were enrolled on the basis of age group 15-25 and 26-40 years, for the study. Asymptomatic pregnant women were

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divided by their gestational age Group A – 1-12 weeks, Group B – 13 -24 weeks, Group C- 25-30 weeks.

A clean-catch mid stream urine sample was collected in a sterile container. Culture vials so collected were sent to laboratory for microscopy, catalase test, nitrate reduction test, culture and sensitivity, within half to one hour. The specimens were analyzed by the following methods.

1. Detection of pyuria - The number of leucocytes /ml were measured in uncentrifuged urine using haemocytometer. The leucocytes were counted in squares present at the four corners of the counting chamber.
2. Catalase test – Frothing was observed on addition of few drops of Hydrogen peroxide to 1ml sample of urine. The positive reaction was due to catalase enzyme.
3. Nitrate reduction test - Pink red color appeared which indicate the presence of nitrite.
4. Culture and sensitivity testing - This was done by semi quantitative calibrated loop method. The urine was mixed thoroughly and inoculated on cysteine lactose electrolyte deficient media (CLED) and its sensitivity was done.

It was the incubated overnight at 35-37°C in air and then colonies were counted. Counts >10<sup>5</sup> organisms/ml were considered as significant bacteriuria. Insignificant growth was reported if colony count were less the 10<sup>5</sup> CFU per ml of urine except in case of growth of *Staphylococcus aureus* where even 10<sup>2</sup> CFU per ml were taken as significant. The isolates were tested for sensitivity using drugs safe in pregnancy namely amoxicillin, cefuroxime, cefotaxim, amikacin, ampicillin and nitrofurantion. The organisms were isolated and species were identified. Antibiotic sensitivity was tested for the isolated organism by Kirby – Bauer method (disk diffusion) with 0.5 McFarland Standard turbidity of the inoculums on Mueller-Hinton agar.

**RESULTS:** Out of 196 cases, asymptomatic pregnant women with positive culture were 22(11.2%) Among the positive culture 16 (9.7%) cases were between the ages 15-25 years and 6 (19.3%) cases were between the ages of 26 -35 years. 165 (84.2%) cases belonged to 15-25 age group and 31 (15.8%) case belonged to 26-40 age group. 30 women which were enrolled in 1 - 12 weeks of gestation showed 5 (16.6%) positive culture. Out of 135 cases between 13-24 weeks of gestation, 11 (8.1%) showed positive cultures and among 31 cases in 25- 32 weeks of gestation 7 (22.5%) showed positive cultures.

Serial No.	Culture Isolates	Women with Significant Bacteriuria	Percentage
1.	<i>Escherichia Coli</i>	9	40.90 %
2.	<i>Klebsiella pneumoniae</i>	3	13.64 %
3.	<i>Proteus mirabilis</i>	3	13.64 %
4.	<i>Klebsiella oxytoca</i>	2	9.09%
5.	<i>Citrobacter freundii</i>	2	9.09%
6.	<i>Enterococcus faecalis</i>	2	9.09%
7.	<i>Staphylococcus aureus</i>	1	4.55%
	<b>Total</b>	<b>22</b>	<b>100%</b>

Table 1: Bacteriological isolates in urine samples

*Escherichia coli* (40.90%) was the most common isolate and followed by *Klebsiella pneumoniae* (13.64%) and *Proteus mirabilis* (13.64%).

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Serial No	Method	Number of positive cases (Total - 22)	Percentage
1.	Pyuria	11	50%
2.	Catalase Test	15	68.2%
3.	Nitrate Reduction Test	12	54.5%
4	Culture	22	100%

Table 2: Shows the accuracy of microscopy catalase test, nitrate reduction test and culture method.

Table 2 shows the accuracy of different method of screening i.e. Microscopy, catalase test, nitrate reduction test and culture. Culture shows highest rate of sensitivity and then was catalase test. The isolates were sensitive to amikacin (90%). Cefotaxim (78%) was the drug which showed sensitive to isolates and then was cefuroxime (65%) nitrofurantoin (60), ampicillin (9%) and amoxicillin (15%).

**DISCUSSION:** The prevalence of asymptomatic bacteriuria has been documented to be as high as 30 to 50%.<sup>[9]</sup> Within the asymptomatic pregnant women the prevalence of positive culture was 11.22% (22). The present study when compared with other studies shows the similar identified isolates. The prevalence rate vary from 4% to 23.9% in studies conducted by various authors.<sup>[10]</sup> The prevalence rate falls within this range. The prevalence of positive culture increased with the age.<sup>[11]</sup> Present study included 9.7% between the age group 15-25 years and 19.3 % in between 26-40 years. Prevalence of positive cases increased with age. Most cases of asymptomatic bacteriuria were found during third trimester (22.5%) and this result correlates with other study. <sup>[12]</sup> In 1-12 weeks of gestation 5 (16.6%) were recorded and between 13-24 weeks of gestation 11(8.1%) cases were recorded. Escherichia coli (40.90%) was the common isolate and was correlated with other studies <sup>[1][4][13][14]</sup> This was followed by Klebsiella pneumoniae (13.64%), Proteus mirabilis (13.64%) Klebsiella oxytoca (9.09%) Citrobacter freundii (9.09%), Enterococcus faecalis (9.09%) and Staphylococcus aureus (4.55%). Catalase test (68.2%) showed highest <sup>[11]</sup> accuracy than nitrate reduction test (54.5%) and pyuria (50%). Amikacin (90%) was the drug which showed increased sensitivity. <sup>[14]</sup> Then were cefotaxime (78%), cefuroxime (65%) and nitrofurantoin (60%) Amoxicillin (15%) and ampicillin (9%) was found to be least sensitive.

**CONCLUSION:** The present study included the prevalence of asymptomatic bacteriuria. This includes age, gestational age and accuracy of screening to culture, the organism isolated and its sensitivity. Gram negative organisms were the commonest organism isolated and above all Escherichia coli was the main urinary pathogen isolated. Prevalence of bacteriuria increased with age of women. The isolates were mostly sensitive to amikacin followed by cefotaxime, cefuroxime, and nitrofurantoin. The isolated organisms were found least sensitive to ampicillin. Culture of urine was the most effective method of detection of asymptomatic bacteriuria during pregnancy.

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