

## Asymptomatic Bacteriuria in Pregnancy

Shubhangi C Dange<sup>1</sup>, Aniruddh Shah<sup>2</sup>, M. N. Dravid<sup>3</sup>

<sup>1</sup>Associate Professor, Microbiology, S.B.H.G.M.C, Dhule.

<sup>2</sup>Medical Student, S.B.H.G.M.C, Dhule.

<sup>3</sup>Prof. & H. O. D. Department Of Microbiology, S.B.H.G.M.C, Dhule.

Corresponding Author: Shubhangi C Dange

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### ABSTRACT

**Background:** Asymptomatic Bacteriuria in pregnant women can lead to maternal as well as foetal complications leading to increase morbidity and mortality. It can be successfully prevented by effective screening and early detection of asymptomatic bacteriuria by doing routine urine culture tests of all pregnant women attending ANC clinics. It should be done routinely along with haemogram, HIV, HBS Ag and Syphilis screen.

**Objectives:** To determine the prevalence of Asymptomatic bacteriuria in pregnant women attending ANC clinics in Civil Hospital, Dhule.

**Material and Methods:** Urine samples from a total of 100 pregnant women were collected; processed and isolated organisms from culture plates were identified using conventional methods during the month of January 2015.

**Results:** Among 100 pregnant women, 28 women showed significant bacteriuria. Hence prevalence rate was 28%. The highest age specific prevalence (28.57%) was found in 20-24yrs age group, while highest prevalence (40.62%) was seen in second trimester. Increased prevalence (57.14%) was seen in multiparous women. Out of total 28 bacterial isolates, 14(50%) were *Staphylococcus aureus*, followed by 10(35.71%) *Esc Coli* and 2 (7.14%) *enterococcus sps.* & *micrococcus sps* each Drug of choice for most of bacterial isolates in our study were Cefaperazone and Nitrofurantoin.

**Conclusion:** From the present study, we conclude that screening for all pregnant women should be carried out to detect asymptomatic bacteriuria, by doing routine urine culture tests once in every trimester as the prevalence rate of Asymptomatic bacteriuria was found 28%. It is recommended to detect asymptomatic bacteriuria in pregnant women and treat with appropriate antibiotic therapy as this could significantly minimize adverse maternal and foetal outcome.

**Key words:** Asymptomatic bacteriuria, prevalence, UTI.

### INTRODUCTION

Urinary tract infection refers to both microbial colonization of urine and tissue invasion of any structure of urinary tract. It is the most common bacterial infection during pregnancy. Asymptomatic bacteriuria acts as major risk factor for development of urinary tract infection during pregnancy. In Asymptomatic bacteriuria, urine culture detects a significant growth of pathogens without the

patient complaining symptoms of urinary tract infection. This condition can be found in both pregnant and non pregnant women. [1] But causes serious complications in pregnant woman like increased maternal risks pre-eclampsia, anaemia, chorioamnionitis and post-partum endometritis. [2] The frequency of asymptomatic bacteriuria in pregnant women is 2 to 9.5%. [3] Pregnancy enhances the progression from asymptomatic to

symptomatic bacteriuria which could lead to pyelonephritis and adverse obstetric outcomes such as prematurity, low birth weight, higher fetal mortality rate. Asymptomatic bacteriuria in pregnancy has been attributed to increase urinary stasis, ureteric relaxation and other anatomical changes. These conditions begin in week 6 and peak during weeks 22 to 24 and this prevent easy passage of urine. Other conditions including transient renal failure, acute respiratory distress syndrome, sepsis, shock and hematological abnormalities occur in cases where asymptomatic bacteriuria is untreated or inadequately treated. Variations have been noted to exist in the incidence of bacteriuria and subsequent UTI in different countries and this has been attributed to differences in definition, methods of screening and associated risk factors such as age, parity, socioeconomic status in pregnancy. Therefore it is important to screen all pregnant women for the presence of bacteriuria at their first prenatal visit. There are several ways to diagnose UTI, but urine culture still remains the most reliable tool for diagnosis. [4]

This cross sectional prospective study was carried out to determine the prevalence of asymptomatic bacteriuria in pregnant women visiting antenatal clinic in Civil Hospital, Dhule.

## **MATERIAL AND METHODS**

**Study design:** Cross sectional prospective study.

A total of 100 pregnant women attending antenatal clinic at civil hospital, Dhule in January 2015, with all age group ranging from 17 to 39 yrs who agreed to enter the study, were clinically evaluated. Exclusion criteria were pregnant women having history of intake of antibiotics, vaginal bleeding, having symptoms of UTI, fever with chills, supra-pubic pain multiple pregnancy, history of pre-term pregnancy, IUGR, pregnancy induced hypertension, recurrent UTI and diabetic.

All these women were asked to submit clean catch midstream urine samples into wide-mouth sterile screw capped containers after proper cleansing of the external genitalia.

Urine samples were labeled and immediately sent to the laboratory. Screening test for significant bacteriuria was not carried out and samples were directly processed for culture and sensitivity. Isolated organisms from culture plates were subjected to colony count as per criteria. Further isolates were identified according to standard microbiological techniques. [5]

In vitro Antimicrobial Susceptibility Testing was performed using Kirby-Bauer disc diffusion test. The isolates from this study were tested against the following antibiotics: Gentamycin (10µg), Amikacin (30mg), Nalidixic acid (30µg), Nitrofurantoin (100µg), Ciprofloxacin (30µg), Cefaperazone, These antibiotics are routinely used as primary line of treatment for UTI in our hospital. Zone diameter was interpreted by CLSI guidelines, 2015. [6]

**Statistical methods:** Statistical analysis was performed by applying proportion of large sample test and it is found that the results in our study were statistically highly significant.

## **RESULTS**

Total 100 pregnant women included in our study, 82% were belonging to age group 20-24 yrs followed by 13% in 25-29 yrs of age. 3 women were above age of 30 yrs but less than 34 yrs. One patient belonged to each group i.e. less than 19yrs & 35-39 yrs of age. Total 28 women showed significant bacteriuria. Hence our prevalence rate for asymptomatic bacteriuria was 28 %. The highest age specific prevalence was found in 20-24 yrs. (28.57 %) while lowest age specific prevalence (3.50%) was found in less than 19 yrs age group [Figure1]. Number of samples showing significant bacteriuria in second and third trimester were 13 (40.62%) and 8(40%) respectively. Similarly in first trimester total 7(14.58%) samples showed

significant bacteriuria. [Table1]. Total number of significant bacteriuria in Multiparous women were 16 (57.14%) while in nulliparous women it was 12(42.85%) [Table 2]

Out of total 28 bacterial isolates 14 (50%) were *Staphylococcus aureus*, followed by *Esch. Coli* 10 (35.71%), *Enterococcus spp.* & *Micrococci* were 2 (7.14%) each. The distribution of bacterial Isolates is shown in figure 2.

Of all isolated *Staphylococcus aureus*, 10(71.42%) were sensitive to

Cefaperazone, 6(42.85%) sensitive to Nitrofurantoin and 2(14.28%) showed sensitivity to Gentamycin & Ciprofloxacin both. Only single isolate was sensitive to Amikacin. Similarly for *E. coli* 60 % isolates were sensitive to Cefaperazone followed by Nitrofurantoin (30%), Gentamycin, Amikacin & Nalidixic acid (10% each). One isolate of *Micrococcus spp.* was sensitive to both Cefaperazone & Nitrofurantoin while an *Enterococcus spp.* showed sensitivity to Nitrofurantoin & Gentamycin, [Table 3].

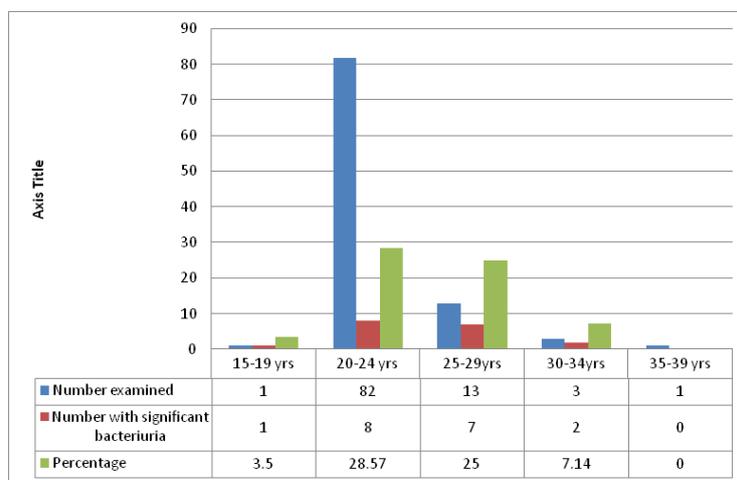


Figure 1: showing prevalence of significant bacteriuria based on Age among pregnant women.

Table 1: showing prevalence of significant bacteriuria based on trimester among pregnant women

Trimester	Number examined	Number with significant Bacteriuria (%)
1	48	07 (14.58%)
2	32	13 (40.62%)
3	20	08 (40%)
<b>Total</b>	<b>100</b>	<b>28 (28%)</b>

Table2: showing prevalence of significant bacteriuria based on parity among pregnant women

Parity	Number examined	Number with significant bacteriuria (%)
Nulliparous	51	12 (42.85%)
Multiparous	49	16 (57.14%)
<b>Total</b>	<b>100</b>	<b>28 (99.99%)</b>

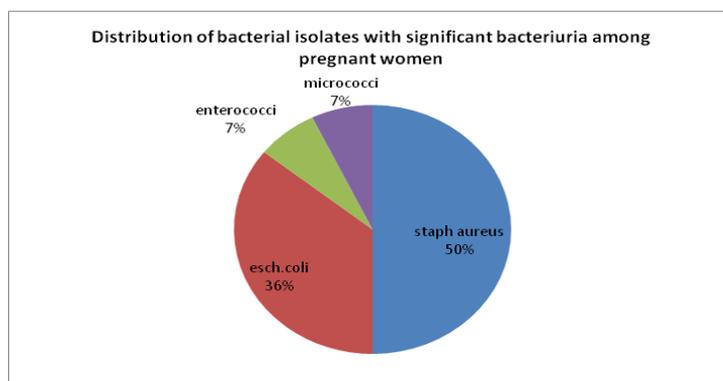


Figure 2

**Table 3: showing Antibiotic sensitivity pattern of bacterial isolates**

Bacterial Isolates	Cefaperazone	Nitrofurantoin	Nalidixic acid	Gentamycin	Amikacin	Ciprofloxacin
<i>Staph. aureus</i>	10 (71.4% )	6 (42.85%)	-	2 (14.28%)	1 (7.14%)	2 (14.28%)
<i>Esch. coli</i> <sup>(10)</sup>	6 (60%)	3 (30%)	1 (10%)	1 (10%)	1 (10%)	Resistant
<i>Micrococcus sps</i> <sup>(2)</sup>	1 (50%)	1 (50%)	-	-	-	-
<i>Enterococcus sps</i> <sup>(2)</sup>	resistant	1 (50%)	-	1 (50%)	-	Resistant

## DISCUSSION

Asymptomatic bacteriuria is common during pregnancy. In the present study, we observed that the prevalence rate for significant bacteriuria in pregnant women is 28 %, which is lower than (35.5% ) reported by Nawal Salim <sup>[1]</sup> and higher than (3.6%) reported by Perera Jennifer, Randeniya Cyril, Perera Piyumi et al <sup>[2]</sup> and (7.3%) by R. Sujatha and Manju Nawani. <sup>[7]</sup> After statistically applying proportion of Large Sample Test, it is found to be highly significant. Also high prevalence of asymptomatic significant bacteriuria shows the significance of microbiological culture for diagnosis of urinary tract infections. Prevalence of asymptomatic bacteriuria was highest in the age group 20-24 yrs (28.57%). This results correlates with the study by R J Girishbabu, R Srikrishna, S T Ramesh et al <sup>[8]</sup> Bacterial isolates have been changing from time to time from place to place. <sup>[7]</sup> An increasing trend in the prevalence of staphylococcus aureus was found among the pregnant women <sup>[1]</sup> In our study, the most common pathogen isolated was Staphylococcus aureus (50%). This correlates with the study by C.A. Turpin, Bridget Minkah, K, A. Danso et al. <sup>[9]</sup> In our study, prevalence rate of *Escherichia coli* was 35.71% which is consistent with the findings of the separate studies by C. Obirikorang, L Quaye, F. Y. Bioetal <sup>[4]</sup> and C.A. turpin, Bridget Minkah, K, A. Danso et al. <sup>[9]</sup> Other organisms isolated were *Micrococcus spp.*(7.14%.) and *Enterococcus species*( 7.14%) which is higher than (3%) reported by R.J. Girishbabu et al <sup>[8]</sup> In pregnant women, the frequency of Asymptomatic bacteriuria (ABU) in the first trimester is 2-9.5 %. <sup>[2]</sup> The US Preventive Services Task Force recommends screening for Asymptomatic bacteriuria with urine culture at 12 to 16 weeks gestation or at the first prenatal visit

(grade A recommendation). At least 1 urine culture should be performed at the end of the first trimester, 2 consecutive cultures are preferable because 1-2% of women with a negative initial urine culture develop ABU and experience acute pyelonephritis later in pregnancy. <sup>[3]</sup> In our study, prevalence rate of asymptomatic bacteriuria (ABU) in the first trimester is 14.58% while 40.62% is in second trimester & 40% in third trimester. Our results correlate with the study by C. Obirikorang, L Quaye, F.Y. Bio et al. <sup>[4]</sup> This could be explained by the fact that most pregnant women in our area report to antenatal clinic during these periods. By parity, pregnant women with at least an existing child (multiparous) had high prevalence of Asymptomatic bacteriuria (57.14%) when compared to nulliparous women. <sup>[4]</sup> The antibiotic sensitivity pattern should be used in determining therapy as inappropriate therapy has been responsible for recurrences of Asymptomatic bacteriuria with development of acute pyelonephritis later. <sup>[2]</sup> The antibiotic sensitivity pattern from this study showed that most of the *Staphylococcus aureus* and *Esch. coli* isolated were sensitive to cefaperazone and nitrofurantoin. The choice of the antibiotic should however be based on urine culture, stage of gestation, clinical data and characteristics of antibiotic. Although aggressive antibiotic treatment may be necessary to reduce the risk of pyelonephritis and other complications of Asymptomatic bacteriuria in pregnancy, this should be done with caution as it known that urinary pathogens are becoming resistant to commonly used antibiotics which could be attributed to wide spread and indiscriminate use of the drugs. <sup>[4]</sup> Choice of antibiotics for the treatment should be guided by antimicrobial susceptibility whenever possible. <sup>[10]</sup>

## CONCLUSION

From the present study, we conclude that every pregnant woman should be screened for Asymptomatic bacteriuria once in every trimester, by doing routine urine culture tests. In this study, prevalence rate of Asymptomatic bacteriuria is 28%. In pregnant women attending the ANC clinic in Civil Hospital, Dhule. The most predominant organisms were *Staphylococcus aureus* and *Escherichia coli*. Drug of choice for most of them was Cefaperazone and Nitrofurantoin. It is recommended to detect Asymptomatic bacteriuria in pregnant women and treat with appropriate antibiotic therapy as this could significantly minimize adverse maternal and foetal outcome. Those who are positive should be followed up closely after treatment so as to avoid recurrence.

**Limitations of study:** This is preliminary study to find out prevalence of asymptomatic bacteriuria in pregnant women. Large group of pregnant women needs to be studied for confirmation of results.

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