

## ASYMPTOMATIC URINARY TRACT INFECTIONS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT TERTIARY CARE HOSPITAL

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### ABSTRACT

#### BACKGROUND

Asymptomatic bacteriuria (ABU) is present if on 1, 2 or more consecutive occasions > 100,000 colony forming units/ml are found in aseptically collected mid-stream sample. Evidence exist that 30% of patients with asymptomatic bacteriuria if not treated go on to develop urinary tract infections.

#### METHODS

This is a cross sectional study conducted in the Department of Obstetrics and Gynaecology, Vedanta Institute of Medical Sciences, Palghar during period of July 2016 to December 2017. 372 pregnant women having asymptomatic bacteriuria during the period of July 2016 to December 2017 attending antenatal clinic were included (all trimester) in this study.

#### RESULTS

Women in the age group of 31-40 years showed the highest incidence of asymptomatic bacteriuria, incidence of asymptomatic bacteriuria was generally high among the three trimesters, but relatively highest during the second trimester. Escherichia coli was the most common 23 (33.3%), followed by Klebsiella pneumonia 18 (26%) and Staphylococcus aureus 15 (21.7%), among the isolates.

#### CONCLUSIONS

All antenatal women should undergo urine cultures to detect asymptomatic bacteriuria, and those who test positive should be treated with appropriate antibiotics, to prevent obstetric complications.

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#### BACKGROUND

Asymptomatic bacteriuria (ABU) is the presence of bacteria in urine without symptoms of acute urinary tract infection. Asymptomatic bacteriuria (ABU) is present if on 1, 2 or more consecutive occasions >100,000 colony forming units/ml are found in aseptically collected mid-stream urine.<sup>1-3</sup> Evidence exist that 30% of patients with asymptomatic bacteriuria if not treated go on to develop urinary tract infections.<sup>4</sup>

Urinary tract infection (UTI) occurs frequently in pregnancy with a large number of infections being asymptomatic. The frequency of asymptomatic bacteriuria (ASB) in pregnancy accounts for the rationale of urinalysis throughout pregnancy period.<sup>5</sup>

It can be associated with varieties of adverse obstetric outcome and medical conditions such as the development of acute and chronic pyelonephritis, preterm labour, low birth weight, pre-eclampsia, chronic renal disease, and prenatal mortality.<sup>6</sup>

The predominant organism that causes UTIs during pregnancy is Escherichia coli, which accounts for 80-90% of infections.<sup>7</sup>

The global prevalence of bacteriuria in pregnancy ranges from 4% to 23.9% in various studies.<sup>8</sup> Low socio-economic status, increasing maternal age, increasing period of gestation, multiparity, anaemia are all contributory risk factors associated with increased prevalence of asymptomatic bacteriuria in pregnancy.<sup>9-10</sup>

Therefore, it is important to study the most common causative organism and their antimicrobial resistance. The objective of this study was to identify the prevalence of ASB, its most common causative microorganisms and the antibacterial susceptibilities of the isolated microorganisms among pregnant women who attended a tertiary care centre.

#### METHODS

**Study Type-** Cross sectional study.

**Place of Study-** Department of Obstetrics and Gynaecology, Vedanta Institute of Medical Sciences, Palghar during period of July 2016 to December 2017.

**Sample Size-** All the pregnant women having asymptomatic bacteriuria during the period of July 2016 to December 2017 attending antenatal clinic were included (all trimester) in this study.

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**Inclusion Criteria**

Pregnant Women having asymptomatic bacteriuria.

**Exclusion Criteria**

- A history of antibiotic therapy taken in the previous two weeks, pyrexia of unknown origin, known congenital anomalies of the urinary tract was excluded from this study.
- Pregnant women with symptomatic bacteriuria.

**Sample Collection and Procedure**

Urine samples were collected by standard mid-stream "clean catch" method from all the pregnant women, in sterile, wide mouthed containers that were covered with tight-fitting lids. Standard microbiological techniques were used to process the samples. The urine specimens were cultured on plates of MacConkey's agar, Sheep Blood agar (in 5-10% CO<sub>2</sub> atmosphere) and Cystine Lactose Electrolyte Deficient agar. Results of culture were interpreted as significant and insignificant according to the standard criteria. The organisms were identified by routine methods from the samples which showed significant bacteriuria.

**RESULTS**

Out of 350 urine samples of ANC Women examined for asymptomatic bacteriuria, 32 were having significant bacteriuria ( $10^5$  cfu/ml) giving incidence rate of 9.14%.

<b>Age Distribution</b>	<b>No. of Samples</b>	<b>No. Positive</b>	<b>Percentage</b>
≤ 20	48	7	(14.5)
21-30	230	39	(16.9)
31≤40	94	23	(24.4)
<b>Total</b>	<b>372</b>	<b>69</b>	<b>18.54</b>

**Table 1. Frequency of ASB in Relation to Age Distribution of Pregnant Women**

Table 1 shows the incidence of asymptomatic bacteriuria according to age distribution showed that majority of the subjects screened were in the age group of 21-30 years, Women in age group 31≤40 years showed the highest incidence of asymptomatic bacteriuria.

<b>Trimester</b>	<b>No. Tested</b>	<b>Positive</b>	<b>Percentage</b>
1 <sup>st</sup>	85	12	14.11
2 <sup>nd</sup>	152	34	22.33
3 <sup>rd</sup>	135	23	17.03
<b>Total</b>	<b>372</b>	<b>69</b>	<b>18.54</b>

**Table 2. Incidence of ASB by Trimester**

Table 2 revealed that incidence of asymptomatic bacteriuria was generally high among the three trimesters, but relatively highest during the second trimester.

<b>Isolates</b>	<b>Number (n=69)</b>	<b>Percentage (%)</b>
Escherichia coli	23	(33.3)
Staphylococcus aureus	15	(21.7)
Klebsiella sp.	18	(26.0)
Proteus sp.	7	(10.1)
Pseudomonas aeruginosa	4	(05.7)
<b>Total</b>	<b>69</b>	<b>(100)</b>

**Table 3. Isolates Obtained Using Standard Biochemical Tests**

Table 3 shows that Escherichia coli was the most common 23 (33.3%) followed by Klebsiella pneumonia 18 (26%) and Staphylococcus aureus 15 (21.7%) among the isolates.

**DISCUSSION**

Asymptomatic bacteriuria (ASB) in pregnancy is a significant cause of premature or low birth infants, postpartum UTIs and high foetal mortality rates. Women who have bacteriuria have increased risk of developing pyelonephritis as compared to women who do not have bacteriuria.

This study showed that frequency of asymptomatic bacteriuria was 18.54% (69 cases) among the sampled population of 350 pregnant women attending ante-natal clinic. This was similar to results of other studies done by Nithyalaxmi J et al<sup>11</sup> 14.19%, but in a similar type of study conducted by Sujatha and Nawani M in Kanpur in 2014, they found the frequency of ASB in only 3% of the cases.<sup>12</sup> This variation may be explained by the differences in the standard of personal hygiene and education.

In our study the incidence of asymptomatic bacteria was highest in second trimester followed by third and first trimester. In a similar type of study conducted by Humera Qudsia Fatima Ansari and Aruna Rajkumari<sup>13</sup> in Hyderabad in 2011 highest incidence of ASB was found in third trimester, but in most of the studies highest incidence of ASB was seen during the first or second trimester which can be explained by the hormonal changes occurring prior to occurrence of anatomical changes.<sup>14</sup>

Among positive cultures which were obtained 46.3% belonged to primigravidae and 53.7% belonged to multigravidae in contrast to study by R. Sujata et al. which showed 48.9% in primigravidae and 51.1% belonging to multigravidae.<sup>12</sup> There was no difference in prevalence of urinary tract infection in pregnant women with previous history of urinary tract infection and those without.

In our study, E. coli was the most common 23(33.3%) followed by Klebsiella sp. 18(26%) and staphylococcus aureus 15 (21.7%), other studies also reported that E. coli were often the most common isolated organism in asymptomatic bacteria.<sup>15-17</sup>

**CONCLUSIONS**

Asymptomatic bacteriuria is associated with complications in pregnancy. It is therefore suggested that pregnant women should be screened for bacteriuria in every trimester of the

gestational period. All antenatal women should undergo urine cultures to detect asymptomatic bacteriuria, and those who test positive should be treated with appropriate antibiotics to prevent obstetric complications.

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