Original Research Article

A Study On Prevalence Of Asymptomatic Bacteriuria Among Pregnant Women Attending Antenatal Clinic Of A Tertiary Care Hospital In Bihar

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Received: 22-11-2021 / Revised: 13-12-2021 / Accepted: 03-01-2022

Abstract

Introduction: Urinary Tract Infections (UTIs) commonly occur pregnancy, due to the morphological and physiological changes that take place in the genitourinary tract. Pregnancy enhances the progression from Asymptomatic Bacteriuria (ASB) to symptomatic bacteruria, which could lead to acute pyelonephritis in 20-50% of cases and to adverse obstetric outcomes such as prematurity, postpartum hypertensive disease, anemia, UTIs, and higher foetal mortality rates, if it is left untreated. The objective of this prospective study was to identify the prevalence of ASB, and its most common causative microorganisms among pregnant women who attended a tertiary care centre in Bihar, India. **Methodology:** This was a prospective study which was conducted in the Department of Microbiology, Shri Krishna Medical College & Hospital, Muzaffarpur, Bihar during a period of one year From January 2021 to December 2021. A total number of 100 pregnant women who attended antenatal clinic during the period of data collection were included in this study. 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. The samples were processed by using standard microbiological procedures. The specimens were cultured on dried plates of MacConkey's agar, Sheep Blood agar (in 5-10% CO_2 atmosphere) and Cystine Lactose Electrolyte Deficient agar, by standard loop method and the plates were incubated at 37°C overnight. Culture results 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. **Result:** In our study, culture positive cases with respect to trimester were as follows: first trimester- 5 (55.6%), second trimester- 3 (33.3%), and third trimester - 1 (11.1%). The commonest bacterium which was detected in culture was *Escherichia coli*. **Conclusion:** As asymptomatic bacteriuria is associated with complications in pregnancy, it is therefore imperative that pregnant women be screened for bacteriuria, periodically in every trimester of the gestational period.

Key Words: Asymptomatic Bacteriuria, Pregnant Women

Introduction

Urinary Tract Infections (UTIs) commonly occur pregnancy, due to the morphological and physiological changes that take place in the genitourinary tract. UTIs are of two types, symptomatic and asymptomatic. Asymptomatic Bacteriuria (ASB) is defined as the presence of actively multiplying bacteria, which is greater than 105/ml of urine within the urinary tract, excluding the distal urethra, at a time when the patient has no symptoms of a UTI[1]. ASB can be found in both pregnant and non–pregnant women. The prevalence of ASB was found to be 2-11% in pregnant women. Pregnancy enhances the progression from ASB to symptomatic bacteruria, which could lead to acute pyelonephritis in 20-50% of cases and to adverse obstetric outcomes such as prematurity, postpartum hypertensive disease, anemia, UTIs, and higher foetal mortality rates, if it is left untreated[2, 3].

Asymptomatic bacteriuria is a microbial diagnosis which is based on the isolation of a specified quantitative count of bacteria in a specimen of urine which is properly collected from a pregnant woman who does not have any signs or symptoms. Thus, urine culture is the gold standard screening technique for ASB which occurs during pregnancy[4, 5].

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The predominant organism that causes UTIs during pregnancy is *Escherichia coli*, which accounts for 80-90% of infections[6].

The relatively high prevalence of ASB during pregnancy, the significant consequences faced by women and their pregnancies, and the ability to avoid undesired outcomes with treatment, justify screening and treatment of ASB in pregnancy. The frequencies of isolated pathogens can vary in different geographical regions[7].

Therefore, the most common causative agents should be investigated and communities should be made aware of their harmful impacts of general health of the women. The objective of this prospective study was to identify the prevalence of ASB, and its most common causative microorganisms among pregnant women who attended a tertiary care centre in Bihar, India.

Methodology

This was a prospective study which was conducted in the Department of Microbiology, Shri Krishna Medical College & Hospital, Muzaffarpur, Bihar during a period of one year From January 2021 to December 2021. A total number of 100 pregnant women who attended antenatal clinic during the period of data collection were included in this study. Pregnant women with a history of UTI symptoms (dysuria, frequency and urgency, etc), pregnancy induced diabetes mellitus/ hypertension, a history of antibiotic therapy taken in the previous two weeks, pyrexia of unknown origin, known congenital anomalies of the urinary tract, were excluded from this study. Prior ethical clearance was obtained from the Institutional Ethics Committee. Informed consents were taken from all the patients before participation. 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. The samples were processed by using standard microbiological procedures. The specimens were cultured on dried plates of MacConkey's agar, Sheep Blood agar (in 5-10% CO_2 atmosphere) and Cystine Lactose Electrolyte Deficient agar, by standard loop method and the plates were incubated at 37°C overnight. Culture results 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.

All the data collected was entered and analyzed using SPSS ver. 21.0. Results has been depicted in forms of tables and figures, wherever relevant.

Results

Among 100 asymptomatic pregnant women who were screened, significant bacteriuria was found in only 9 cases. Among positive cultures which were obtained, a little less than half belonged to primigravidae and rest belonged to multigravidae. Highest incidence, 66.7% was reported in the age group of 21-30 years. In our study, culture positive cases with respect to trimester were as follows: first trimester- 5 (55.6%), second trimester- 3 (33.3%), and third trimester - 1 (11.1%). The commonest bacterium which was detected in culture was *Escherichia coli*.

Table 1: Showing distribution of samples collected based on the results of culture obtained

Results of culture	Number of cases
Significant bacteriuria	9
Insignificant bacteriuria	3
Contamination	14
Sterile	74
Total	**100**

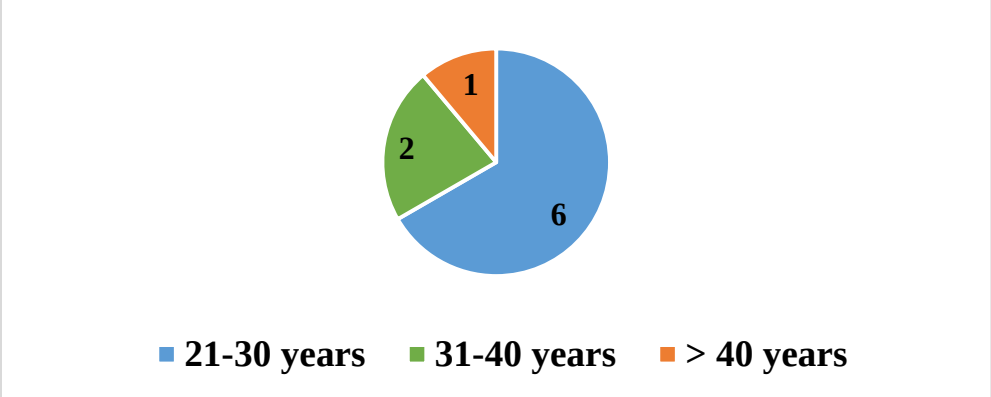

Fig 1: Pie distribution of participants based on their age

Table 2: Distribution of cases based on bacterial isolates

Bacterial isolates	Number (%)
Escherichia coli	7 (77.8%)
Klebseilla pneumonia	1 (11.1%)
Enterococcus faecalis	1 (11.1%)

Discussion

Asymptomatic bacteriuria (ASB) in pregnant women is one of the important causative factors which results in premature or low birth infants, postpartum UTIs and higher foetal mortality rates. Women who have bacteriuria have a 20-50 fold increased risk of developing pyelonephritis as compared to women who do not have bacteriuria[2]. Those women who show positive cultures should be treated as per antimicrobial sensitivity patterns of the bacteria which are isolated from their samples, to prevent maternal and foetal morbidities. In this study, the prevalence of asymptomatic bacteriuria was 9%, which was similar to those seen in various other studies[8-13]. Neupane et al., (26%) and Imade et al., (45.3%) reported a higher prevalence[14, 15]. This variation may be explained by the fact that there were differences in the environments, social habits of the community, socio-economic statuses, and the standards of personal hygiene and education of the patients who were studied. In this study, the age group of 21-30 years showed the highest prevalence of infection (66.7%), followed by age group of 31-40 years (22.2%). Alghalibi et al.[16], reported a higher prevalence of UTIs in pregnant women who were aged 21-25 years and Turpin et al.[9], reported a higher prevalence of ASB in pregnant women who were aged 35-39 years. Advanced maternal age (of ≥35years) was reported as a risk factor for asymptomatic bacteriuria[17]. The observed trend of bacteriuria in this study and reports from other studies showed that the age range of 21-40 years served as the high risk group for development of UTIs in pregnant women.

In this study, incidence of asymptomatic bacteriuria was higher in multigravidae, which was similar to Roy et al.[18], and Obirikorang et al.,'s findings[12]. In this study, a higher rate of infection detection was seen in first trimester of pregnancy, which was similar to that seen in the study of Yahodara et al.[19], Studies done by Roy et al.[18], and Nath et al.[20], reported high rates of infection detection in second trimester. Turpin et al.[9], reported a high percentage of asymptomatic bacteriuria in the first and early second trimesters of pregnancy and attributed it to pregnant women reporting at the antenatal clinic for booking during these periods. The higher incidence in first trimester could be caused by hormonal changes occurring prior to occurrence of anatomical changes. Moreover, earliest study done by Kass explains that there is rare acquisition of bacteriuria after the second month of pregnancy[8].The bacteria which are responsible for asymptomatic bacteriuria are of faecal origin, which colonize the periurethral area. Different studies[10-12, 15, 21-23] have shown that *Escherichia coli* were the commonest isolate which was found; same was found in our study also.

Conclusion

As asymptomatic bacteriuria is associated with complications in pregnancy, it is therefore imperative that pregnant women be screened for bacteriuria, periodically in every trimester of the gestational period. Routine urine culture tests should be carried out for all antenatal women to detect asymptomatic bacteriuria, and every positive case should be treated with appropriate antibiotic therapy, to prevent any obstetric complication which is associated with pregnancy. In view of changing patterns of bacterial resistance to common drugs, the importance of educating physicians on use of antibiotics accordingly to provide empirical therapy, is important.

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