

Clinico - Microbiological profile and risk factors for asymptomatic bacteriuria among pregnant women : A case series study

Shilpa K Gokale, Shivakumar S Solabannavar, J Supriya, Suresh B Sonth, Anand Bjanagond, Arati Bhurle and Anushka Devinkar, Amith Joshi,

Department of Microbiology, S N Medical College, Bagalkot, Karnataka, India

Abstract

Introduction: Asymptomatic bacteriuria in pregnant women can lead to maternal as well as foetal complications leading to increase morbidity and mortality. It can be detected by doing urine culture tests of all pregnant women attending ANC clinics.

Objectives: To screen pregnant women for ASB by urine culture and to know the risk factors associated with Asymptomatic bacteriuria.

Material and Methods: Urine samples from a total of 120 pregnant women were collected; processed and isolated organisms were identified using conventional methods. A detailed questionnaire involving age, address, socioeconomic status, qualification and previous obstetric history was filled during sample collection.

Results: Out of 120 studied cases 11 patients were found to be having asymptomatic bacteriuria. ASB was more common in the low socioeconomic group, in the 18-25 years and most common organism isolated was E coli.

Conclusion: Urinary tract infection are more common in pregnant than non pregnant women. UTI is associated with risk to both the foetus and the mother. The earlier diagnosis and proper antimicrobial treatment in these women would prevent the obstetric complications

Key words: Asymptomatic bacteriuria, Pregnant women, Antimicrobial, Urine culture

Introduction

UTI is the commonest of all bacterial infections affecting human beings throughout their life span especially in women^[1]. Physiological and anatomical changes like enlarging uterus obstructing the ureters and the bladder, hormonal changes like glycosuria, aminoaciduria provides an excellent medium for bacterial growth that favour urinary tract infection^[2]. Urinary tract infection during pregnancy is classified in to symptomatic and asymptomatic. Asymptomatic bacteriuria (ASB) is defined as persistently and actively multiplying bacteria in significant numbers i.e 10⁵ bacteria/ml within urinary tract without any obvious symptoms^[3,4].

The risk factors for asymptomatic bacteriuria include previous history of urinary tract infections, diabetes mellitus, immunosuppression, low socioeconomic

status, anatomical urinary tract abnormalities, sickle cell disease and increased parity^[4,5,6].

Global prevalence of ASB varies widely and in pregnancy it is 1.9% to 9.5%, while in India it is found to be on higher side i.e between 5 -12%^[3,6,7]. Detection of ASB during pregnancy is important as women identified with ASB in early pregnancy have 20-30 fold increased risk of developing pyelonephritis during pregnancy, compared with women without bacteriuria. Quantitative urine culture is the gold standard for diagnosis of ASB.

Various randomized controlled trials shown that effective antibiotic therapy of asymptomatic bacteriuria in pregnancy significantly reduces the risk of pyelonephritis, premature birth and low birth weight^[3,8,9]. Routine screening for the presence of clinically significant bacteriuria in all pregnant women

Address for Correspondence:

Dr Shilpa K Gokale

Professor, Department of Microbiology, S. N. Medical college, Bagalkot, Karnataka, India

Email: shilpagokale@gmail.com

and its management by appropriate antibiotics therapy on the basis of the gestational age and culture sensitivity report is essential^[4,10].

This study was conducted to screen pregnant women for ASB by urine culture and to know the risk factors associated with asymptomatic bacteriuria.

Material and Methods

This study was conducted in the department of Microbiology of a tertiary care hospital. Written informed consent was taken from all the participants. Demographic details such as age, address, socioeconomic status and educational qualification of all the participants was noted. Gestational age, details of previous antenatal visits and previous history of urinary tract infection was noted.

Pregnant women in the age group of 18-45 years without any signs and symptoms of UTI were included in the study.

All pregnant women without any signs and symptoms of UTI were included and women with History of UTI symptoms (dysuria, frequency, urgency & burning micturition), Pregnancy with diabetes / hypertension, History of antibiotic therapy in the previous 2 weeks, Pyrexia were excluded from the study.

Sample collection and processing

About 30 ml of clean catch mid - stream urine samples were collected in 100 ml sterile wide mouth container with lids, after giving instructions to the patients regarding the sample collection. The samples were immediately transported to the laboratory and were processed within one hour. In case of delay, the samples were refrigerated at 4°C. The specimens were processed in the laboratory for culture by the semiquantitative method.

Culture

The urine was cultured on blood agar and MacConkey's agar. A loopful of well mixed uncentrifuged urine was streaked on to the surface of the culture plates. Incubation was done for 18-24 hr's. A pure growth of 10⁵ cfu/ml was considered to be suggestive of significant bacteriuria. Pure growth between 10³ and 10⁵ cfu/ml was taken as doubtful significance and the culture was repeated, while pure of 10³ cfu/ml was taken as non significant bacteriuria. Mixed growth of two or more organisms were considered to be contamination. Significant bacterial isolates were identified by standard procedures and were subjected to antibiotic susceptibility testing by the Kirby bauer's disc diffusion method^[11].

Results

One hundred twenty pregnant women attending the antenatal clinics were taken for study. Out of 120 samples, 109 (90.8%) were sterile. Organisms in pure culture in significant number were obtained in 11 cases (9.1%). In these 11 cases pure growth of 10⁵ cfu/ml was seen. None of the samples showed growth contamination.

Asymptomatic bacteriuria was more common in 18-25 years age group (6) followed by 26-30 years (3) group and 31-35 years group (2). No cases were found in age group 35 and above in our study.

Table 1: Age group of the studied cases

Age in years	Asymptomatic bacteriuria cases	Percentage%
18-25 years	6	54.5
26-30 years	3	27.2
31-35 years	2	18.1
>35 years	0	0
Total	11	100

Pregnant women from low socioeconomic status (8) had highest incidence followed by middle class (2) and upper class (1)

Table 2: Socioeconomic status of the studied cases

Socioeconomic status	Asymptomatic bacteriuria cases	Percentage %
Low	8	72.7
Middle	2	18.1
Upper	1	9.1
Total	11	100

Asymptomatic bacteriuria (ASB) was more common in primigravida (8) than multigravida (3). There were 8 cases with gestational age less than 20 weeks, followed by 2 in 20-28 weeks and 1 in 28-37 weeks

Table 3: Gestational age of the studied cases

Gestational age	Asymptomatic bacteriuria cases	Percentage %
Up to 20 weeks	8	72.7
21-28 weeks	2	18.1
29-37 weeks	1	9.1
37 weeks	0	0
Total	11	100

In our study out of 120 pregnant women, 11 (9.1%) were found to be suffering from asymptomatic bacteriuria and the organisms isolated were E coli 6 (54.5%), Klebsiella 2 (18%), staphylococcus epidermidis 2 (18.1%) and Acinetobacter spp 1 (0.83%).

Table 4: Organisms isolated in ASB cases

Organism isolated	No of cases	Percentage %
Escherichia coli	6	54.5
Klebsiella	2	18.1
Staphylococcus epidermidis	2	18.1
Acinetobacter spp	1	0.8
Total	11	100

Discussion

Urinary tract infection is one of the most common health problems in pregnancy because of increase in the sex hormones, anatomical & physiological changes during pregnancy. The global prevalence of UTI in pregnancy is found to range from 1.9% to 9.5%. In our study 9.1% of study subjects had ASB. In a study conducted by S M Umamgeswari^[2], they found 9.4% of pregnant women had ASB, which correlates well with our study.

Asymptomatic bacteriuria was predominantly seen in primigravida in our study, which is correlating with the study done by Gopchade CA^[4] and Anjana Telkar et al^[3]. More number of cases were seen in the age group of 18-25 years age group than other age group. This correlates with the study by R J Girishbabu^[6].

The most common gestational period affected was below 20 weeks which is in accordance with the study conducted by Gopchade et al^[4]

In our study out of 120 pregnant women, 11 (9.1%) were found to be suffering from asymptomatic bacteriuria and the organisms isolated were E coli 6 (54.5%), klebsiella 2 (18.1%), Staphylococcus epidermidis 2 (18.1%) and Acinetobacter SPP 1 (0.83%). Shamweel Ahamad et al^[1] found E coli (71%) to be the commonest followed by Klebsiella (17%), which correlates with our study. Turpin et al^[12] in their study found E coli (37%) to be the commonest followed closely by Staphylococcus aureus (31%). All the 11 isolates showed varying susceptibility to different antibiotics.

All the patients with ASB were treated by oral antibiotics for 5 days. Repeat urine culture after antibiotic therapy showed resolution of asymptomatic bacteriuria in all the cases. The connection between low birth weight, premature delivery and asymptomatic bacteriuria has been reported by many authors. Romero R et al conducted an extensive review of literature with an objective to find out whether untreated bacteriuria adversely affects the pregnancy outcome and they concluded that clinic-epidemiological evidence indicates a strong association between untreated ASB and LBW/preterm delivery and that antibiotic

treatment is effective in reducing the occurrence of LBW.

Conclusion

Asymptomatic bacteriuria is commonly seen in pregnancy. Its diagnosis and treatment is important as untreated cases may progress to symptomatic infection and may affect fetal maternal well being. So we recommend to screen all the pregnant women for ASB by urine culture. A simple 5 days appropriate antibiotics therapy is associated with resolution of asymptomatic bacteriuria in almost all the cases.

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