Original Article

Organisms Causing Asymptomatic Bacteriuria in Pregnant Women Attending Antenatal Clinic of Isra University Hospital Hyderabad

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Abstract

Objective:To determine the common organisms causing asymptomatic bacteriuria in pregnant women attending antenatal clinic of Isra University Hospital Hyderabad.

Methodology: This descriptive cross-sectional study was held at the Department of Obstetrics and Gynecology at Isra University Hospital, Hyderabad, Sindh Pakistan from June 2016 to November 2016. All the pregnant women of age >18 years, any gestation age attending antenatal clinic of Isra University Hospital on the routine first antenatal visit were included. Sample of mid-stream urine about 30 – 50 ml was collected in sterile wide mouth100 ml capacity container of each patient. After collection and labelling the specimens, were immediately sent to Hospital pathology laboratory to evaluate the causative organisms and antibiotic sensitivity. All the data was recorded in the self-made proforma. Data analysis was done by SPSS version 20.

Results: Total of 210 pregnant women were observed their mean age was 26.43±5.48years and the mean gestational age was 23.46±9.57 weeks. Out of 210 pregnant females screened against asymptomatic bacteriuria, 19(9%) were found with a positive urine culture. How ever Escherichia –coli was found in 12 patients, Pseudomonas in 4, Proteus mirabilis in 2 and Klebsiella was seen in 1 patient out of 19. Increasing age, elevated gestational age and parity are at high risk of bacteriuria.

Conclusion:It was concluded that asymptomatic bacteriuria during pregnancy is a common problem. The frequency of asymptomatic bacteriuria was 9% on screening by urine culture. Common isolated organisms were E- Coli, Pseudomonas, Klebsiella and Proteus mirabilis.

Keywords:Asymptomatic bacteriuria, organisms, Pregnancy

Cite this article as: Parveen U, Brohi PZ,Zaki N, Rana MY.Organisms causing asymptomatic bacteriuria in pregnant women attending antenatal clinic of Isra University Hospital Hyderabad.J Soc Obstet Gynaecol Pak.2020; Vol 10(2):102-105.

Introduction

Asymptomatic bacteriuria is defined as substantial bacteria present, without symptoms, in an individual's urine. During pregnancy, the evident reduction in expectant women 's immunity continues to promote the development of pathogens.[1] Asymptomatic bacteriuria, in females who have no symptoms indicative of urinary tract infection (UTI) refers to continuously developing bacteria in urinary tract.[2] Throughout pregnancy, the physiological rise in glucose levels decreases urine volume and around70 %of expectant females develop

Authorship Contribution: [1,3]Conceived and planned the idea of the study, data collection and writing of the manuscript, [2]Supervised the study all along and reviewed the manuscript, [4]Data analysis & interpretation of the statistics.

Funding Source: none
Conflict of Interest: none

Received: Feb 11, 2020
Accepted: July 09, 2020

glycosuria, which promotes urinary bacterial production.[1] In expectant females, anatomical and physiological variations in the urinary system, and also variations in the immune response during pregnancy, raise the incidence of ASB and sometimes result in symptomatic infection, causing serious feto-maternal consequences. Increasing age, sickle cell anemia, diabetes, parity, UTI history, disorders of urinary tract and immune deficiency can raise UTI risk among pregnant women.[3-5] The major cause for complications like anemia, pyelonephritis, low birth weight, preterm labor, prenatal death, and maternal sepsis, however, is also Asymptomatic bacteriuria (ASB).[6] ASB occurs in 2%-10% of all pregnant women and if left untreated may result in acute pyelonephritis or acute cystitis in around 30.0%-50.0% of pregnancies.[6,7] The incidence rate for asymptomatic bacteriuria is similar among pregnant and non-pregnant females, suggesting that pregnancy by itself does not lead directly to asymptomatic bacteriuria emergence. Few Iranian studies have indicated that asymptomatic bacteriuria prevalence among pregnant females ranged between 6.1% and10.9%.[8,9] ASB incidence was documented to be around 6 to 10.2% among pregnant females in Asian nations including Pakistan, India and Bangladesh.[10] Pyelonephritis risk management contributes significantly in the diagnosis and management of asymptomatic bacteriuria. Antibiotic therapy resistance and causative species vary wildly; with various parts of the same nation harboring diverse pathogens. Yet resistant strains may lead pregnant females to get asymptomatic infections. So it is important to monitor common infectious agents. This study has been conducted to determine the frequency and common organisms causing asymptomatic bacteriuria in pregnant females attending antenatal clinic of Isra University Hospital Hyderabad.

Methodology

This descriptive cross-sectional study was held at the Department of Obstetrics and Gynecology at Isra University Hospital, Hyderabad, Sindh Pakistan. The study duration was 6 months from June 2016 to November 2016. All the pregnant women of any age, at any gestation attending antenatal clinic of Isra University Hospital on the routine first antenatal visit, were enrolled in this study. Females with known congenital anomalies of the urinary tract, signs, and symptoms of urinary tract infection, antibiotics usage history during the preceding 2 weeks, Known diabetics and renal diseases, catheterization history during the preceding 2 weeks and women with pyrexia were excluded. The study participants were asked to participate in the research by informing them briefly about the purpose of the study. Verbal consent was taken from the participants to include their urine culture report in the research and used for analysis. The participants were told to wipe their perineum with soapy water and rinse well. Then one sample of mid-stream urine about 30 - 50ml was collected in a sterile wide mouth100 ml capacity container. After collection and labeling the specimen, it was immediately sent to Isra Hospital pathology laboratory to evaluate the causative organisms and their sensitivity. All the data was recorded in the self-made proforma. Data analysis was done by SPSS version 20.

Results

A total of 210 pregnant women were observed in those visiting Obstetrics and Gynecology clinic at the Isra Hospital Hyderabad for antenatal care. The most common age groups were 21 to 25 years 33.8% and 26 to 30 years 27.1%, while 20.5% of patients presented with age group of 17-20 years and 18.6% were between the age of 31-40 years. The mean age of women was 26.43$\pm$5.48years. Out of 210 women, 65 (31.0%) were primiparous, 125 (59.5%) were multiparous and 20 (9.5%) were grand multiparous. Eighty-six (41.0%) women had a gestation of women was 23.46$\pm$9.57. (Table I)

Table I: Patients distribution according age, gestational age and parity (n = 210)

Characteristics		Frequency	Percent
Age groups (years)	17 t0 20	43	20.5%
	21 to 25	71	33.8%
	26 to 30	57	27.1%
	31 to 40	39	18.6%
Gestational age (weeks)	6 to 20	86	41.0%
	21 to 30	66	31.4%
	31 to 40	56	27.6%
Parity	Primiparous	65	31.0%
	Multiparous	125	59.5%
	Grand Multiparous	20	9.5%

Out of 210 pregnant women, screened for asymptomatic bacteriuria, 19(9%) had positive urine culture for significant bacteriuria. Asymptomatic bacteriuria was taken as pure growth of organism $\geq$105 organisms per ml of urine and 191(91.0%) had negative urine culture. The most common bacterial isolate were Escherichia -coli, (63.1 %), followed by

Pseudomonas 21.0%, Proteus mirabilis 10.5%, and Klebsiella was seen 5.2% out of 19. (Table II)

Increasing age, elevated gestational age, and parity are on high risk of bacteriuria and these were significantly associated with positive culture, p-values were significant. (Table III)

Table II: Urine culture status of study participants (n =210)

Characteristics		Frequency	Percent
Urine culture	Positive	19	9.0%
	Negative	191	91.0%
Organisms of positive culture	E-coli	12	63.1%
	Pseudomonas	4	21.0%
	Proteus Mirabilis	2	10.5%
	Klebsiella	1	5.2%

Table III: Urine Culture Status Of Study Participants According To Age Groups (n = 210)

Variables	Urine culture		P-value
	Positive n = 19	Negative n = 191	
Age groups			
17to 20	2 (4.6%)	41 (95.4%)	
21 to 25	7 (9.9%)	64 (90.1%)	0.001
26 to 30	4 (7.1%)	53 (92.9%)	
31 to 40	6(15.4%)	33 (84.6%)	
Parity			
Primiparous	5(7.6%)	60(92.3%)	
Multiparous	10(8.0%)	115(92.0%)	0.001
Grand Multiparous	4(20.0%)	16(80.0%)	
Gestational age			
6 to 20	5 (5.8%)	81(94.1%)	
21 to 30	6 (9.0%)	60 (90.9%)	0.001
31 to 40	8 (13.7%)	50 (86.2%)	

Discussion

Asymptomatic bacteriuria is essential to be treated during the pregnancy to avoid complications such as pyelonephritis, premature labor, hypertension, preeclampsia, and septicemia. In this study, 0ut of 210 pregnant females screened against asymptomatic bacteriuria, 19 (9%) were found with positive urine culture for significant bacteriuria. The common organisms were E-coli, 63.1%, Pseudomonas 21.0%, Proteus mirabilis10.5% and Klebsiella 5.2 % out of 19. A study conducted by Shuja S et al[11] reported 12.4% of incidence for asymptomatic bacteriuria and E. coli as a commonest causative agent. Another study conducted by Nteziyaremye J et al[12] reported that the most common isolates in descending order in their study was E. coli and S.aureus. Our finding agrees with earlier reports[13] showing the same predominance pattern of infection with Escherichia coli. This may be attributable to the reality that during pregnancy urinary stasis is prevalent and because most strains of Escherichia coli favor this same setting and cause UTI. One more explanation could be the poor genital hygiene activities by expectant females who possibly find it challenging to adequately wash their genital area following urinating or defecating. Farazi A etal[7] also reported that 12% of females had asymptomatic bacteriuria. E. coli was the commonest isolate. Ali IE et al[14] also reported a 15.6% prevalence for asymptomatic bacteriuria.

In this study increasing age and multiparity were at high risk of bacteriuria and these were significantly associated with a positive culture. In earlier studies, the previously mentioned age groups have also been reported to have the highest infection.[15,16] Advanced age of mothers more than 35 years has also been recorded to be a risk factor of asymptomatic bacteriuria during pregnancy .[17] One other possible explanation may be that most of the advanced age females may have had a lot of children before the current pregnancy because multiparty is among the risk factors for asymptomatic bacteriuria development during pregnancy.[18]

In this study second and third trimester were significantly linked to asymptomatic bacteriuria, while Farazi A etal[7] reported a higher infection rates (34.6%) during 1st and 2nd trimester of pregnancy, followed by 3rd trimester (30.8%). A study conducted by Imdad et al[19] did not found any significant variance in the asymptomatic bacteriuria prevalence in terms of the trimester. Gayathree L et al[20] documented higher asymptomatic bacteriuria prevalence during third trimester in comparison to the 2nd and 1st trimester. Pregnant females were found to have the highest incidence of asymptomatic bacteriuria during3rd trimester (36 %), after that 2nd trimester (33.1%) and least in first trimester as revealed by Amadi ES et al[16]. Another study conducted by Prasanna B et al[21] reported that Many culture positive reports were observed during3rd trimester (49%), after that the 2nd (29%)and 1st (22%)trimesters. However, another study conducted by Shrestha T et al[22] reported a non-significant variance in the incidence of asymptomatic bacteriuria in terms of age, gestational age and parity. However Ali IE et al[14] reported that average household

income, catheterization history, anemia, UTI history, and parity were statistically significantly associated with ASB prevalence among pregnant females.

In this study, multiparity was correlated with a raised risk of bacteriuria. The higher ASB prevalence in multigravida could be due to raised colonization of pathogens in the urinary tract because of previous infections or recurrent exposure to the urinary stasis. Most pregnant females in our study were reported during 2nd trimester and 3rd trimester in antenatal checkups. The incidence of ASB is more pronounced in the third trimester possibly because of physiological and anatomical variations associated with progressing gestational age, which promotes bacterial multiplication and results in urinary stasis.

Conclusion

It was concluded that asymptomatic bacteriuria during pregnancy is a common problem. The frequency of asymptomatic bacteriuria was 9% on screening by urine culture. Common organisms were E- Coli, Pseudomonas, Klebsiella, and Proteus mirabilis respectively. Screening for bacteriuria should be taken as a vital part of antenatal care. More studies are suggested on a larger sample size of expectant females, where the type of infection, recurrence of urinary tract infection, and the relationship between possible risk factors, including personal hygiene, socioeconomic status, and education level.

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