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ASYMPTOMATIC BACTERIURIA IN PREGNANT WOMEN ATTENDING A TERTIARY CARE HOSPITAL, MANIPUR

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A B S T R A C T

INTRODUCTION: Asymptomatic bacteriuria is the significant presence of bacteria in the urine of an individual without symptoms. This study was carried out to determine the prevalence of asymptomatic bacteriuria in pregnant women attending RIMS hospital, Imphal.

MATERIAL AND METHODS: The study was conducted in the Department of Microbiology, RIMS hospital from August 2017 till January 2019.A total of 380 urine samples were collected from pregnant women attending Obstetrics and Gynaecology OPD, RIMS Imphal. Culture of the urine was done on Cysteine lactose electrolyte deficient agar. For positive growth, conventional methods were performed to identify the bacteria and antibiotic susceptibility testing was done on Mueller Hinton Agar.

RESULTS: Significant bacteriuria was found in 9.1% of the asymptomatic cases. 30 urine samples were contaminated and number of positive growth was 32 (17 *Escherichia coli*, 7 *Staphylococcus saprophyticus*, 4 *Staphylococcus aureus*, 2 *Enterococcus faecium*, 1 *Klebsiella pneumoniae*, 1 *Acinetobacter baumannii*.

CONCLUSION: Routine urine culture should be carried out on all antenatal patients in order to identify any unsuspecting infection. This will help in reducing maternal and obstetrics complications associated with pregnancy.

KEYWORDS: Asymptomatic bacteriuria, Pregnant women, Urine culture, Prevalence, Urinary tract infection.

INTRODUCTION

Infection of the urinary tract is a common problem due to the morphological and physiological changes that takes place in the genitourinary tract during pregnancy. It may be of two types, symptomatic or asymptomatic.[1]Asymptomatic bacteriuria (ASB) is defined as persistently and actively multiplying bacteria in significant numbers i.e., > 10^5 bacteria per ml within the urinary tract, excluding the external urethra without any obvious symptoms. It is also known as Covert bacteriuria.[2,3] The term asymptomatic bacteriuria of pregnancy refer to the presence of a positive urine culture in an asymptomatic pregnant female.[4]

Pregnant women with ASB are more likely to develop acute pyelonephritis in later pregnancy, postpartum urinary tract infection, hypertensive disease of pregnancy, anemia, chronic renal failure, prematurity, low birth weight babies and prenatal death if untreated. The incidence of these can be decreased by treating ASB during pregnancy promptly.[5]

Various studies from the west have documented the prevalence of asymptomatic bacteriuria in pregnancy to be between 2 and 7% while in India it was found to be on higher side i.e., between 5 and 17%. Studies in African region showed higher prevalence than both these regions .[6] Detection of ASB during pregnancy is important as women identified with ASB in early pregnancy have 20-30fold increased risk of developing pyelonephritis during pregnancy, compared with women without bacteriuria.[4]

The Gold standard investigation for detection of asymptomatic bacteriuria is urine culture. Therefore, urine culture at first prenatal visit or between 12 and 16 weeks of gestation should be considered as a screening test of choice.[7] Commonest organisms isolated are *Escherichia coli*, Coagulase negative Staphylococcusspecies, Klebsiellaspecies, Pseudomonas species and Proteusspecies.[6] The relatively high prevalence of asymptomatic bacteriuria during pregnancy,

the significant consequences for women and for the pregnancy and the ability to avoid sequelae with treatment, justify screening pregnant women for bacteriuria.[5]

MATERIAL AND METHODS

This cross-sectional study was conducted in the Department of Microbiology, RIMS, Imphal, over a period of one and half years from August 2017 till January 2019. Urine samples were collected in sterile wide mouth universal container from antenatal patients attending RIMS Obstetrics and Gynaecology OPD, Imphal.

Samples were inoculated on Cysteine lactose electrolyte deficient agar within 2 hours of collection. Inoculated specimens are incubated at 37°C for 24 to 48 hours in aerobic condition. After incubation, identification of bacterium from significant growth was done with conventional methods like colony characteristics, gram staining and various biochemical tests.

The antibiotic susceptibility testing of all isolates was performed by Kirby Bauer's disc diffusion method on Mueller Hinton agar and interpreted as per CLSI M100S 2017 recommendations.

RESULTS

Total of 380 urine samples were collected from Obstetrics and Gynaecology OPD, RIMS, Imphal, for culture. Among them, 30 samples were contaminated and 32 significant growth was obtained.

Among 32 significant growth, *Escherichia coli* (17/32) was the most predominant organism followed by *Staphylococcus saprophyticus* (7/32), *Staphylococcus aureus* (4/32), *Enterococcus faecium* (2/32) , *Acinetobacter baumannii* (1/32) and *Klebsiella pneumoniae* (1/32) as shown in Table 1.

Out of 32 positive growth, 17 belongs to 3rd trimester of pregnancy,9 of them belongs to 2nd trimester and 6 of them from 1st trimester patients as shown in Table 2.

Majority of the positive cases were from age group of 25-29 years(13/32) as compared to age range of 18-24years(9/32) and 30-35years (10/32) group as shown in Table 3.

Multigravida cases(20/32) had higher incidence of significant bacteriuria compared to primigravida cases(12/32) as shown in Table 4.

Resistance pattern of gram positive and gram negative isolates are given in table 5 and 6 respectively.

Table 1: Different types of bacteria obtained from urine culture

Organisms	Number(n-32)	Percentage
Escherichia coli	17	53.12%
Staphylococcus saprophyticus	7	21.87%
Staphylococcus aureus	4	12.5%
Enterococcus faecium	2	6.25%
Acinetobacter baumannii	1	3.12%
Klebsiella pneumoniae	1	3.12%

❖ n- total number

Table 2 : Trimester wise distribution of the bacterial isolates

Trimester	Number(n-32)	Percentage
1st	6	(18.75%)
2nd	9	(28.12%)
3rd	17	(53.12%)

Table 3: Age-wise distribution of positive growths

Age	Number(n-32)	Percentage
18-24	9	(28.12%)
25-29	13	(40.62%)
30-35	10	(31.25%)

Table 4: Parity-wise distribution of positive growths

Parity	Number(n-32)	Percentage
Primi	12	(37.5%)
Multi	20	(62.5%)

Table 5: Antibiogram of Gram positive isolates

Antibiotics	*Staphylococcus saprophyticus* (n=7)	*Staphylococcus aureus*(n=4)	*Enterococcus faecium*(n=2)
Cefoxitin	0	0	NA
Clindamycin	4	1	NA
Linezolid	2	0	1
Gentamicin/High level gentamicin	0	3	0
Vancomycin	0	0	0
Cotrimoxazole	4	0	NA
Erythromycin	3	3	1
Ciprofloxacin	2	0	0
Penicillin	2	3	1
Nitrofurantoin	0	0	0

n-number,NA-not applicable

Table 6: Antibiogram of Gram negative isolates

Antibiotics	*Escherichia coli* (n=17)	*Klebsiella pneumoniae* (n=1)	*Acinetobacter baumannii* (n=1)
Amikacin	2	1	0
Gentamicin	4	0	0
Cotrimoxazole	6	0	NA
Ciprofloxacin	6	1	0
Ceftazidime	4	0	0
Imipenem	0	0	0
Piperacillin-tazobactam	3	0	0
Ceftriaxone	6	0	0
Colistin	0	0	0
Nitrofurantoin	4	0	0

- NA-not applicable

DISCUSSION

Urine samples collected from asymptomatic pregnant women attending Obstetrics and Gynaecology department of our hospital was 380 in number, of which 32 gave significant growth of bacterial isolates. Women with asymptomatic bacteriuria during pregnancy are more likely to deliver premature or low-birth-weight infants and have a 20 to 30 fold increased risk of developing pyelonephritis during pregnancy, compared to women without bacteriuria .[8] Prevalence of ASB among pregnant women was 9.1%, which is closer to the results of other studies .[9-11]

Multiparity is identified as a risk factor for asymptomatic bacteriuria (Ajayi, 2012; Girishbabu et al., 2011; Kerure et al., 2013) .[12,13,14,18,19] This correlates with our study, in which we observed that the occurrence of asymptomatic bacteriuria was high among multigravida (62.5%), when compared to primigravida (37.5%), (Table 4). Higher rate of infection was noted in the third trimester as compared to the first and second trimester which is in alignment with the studies by Harshika et al and Senthinath et al .[13,15] Most pregnant females who had ASB were home makers.

One of the identified risk factor for asymptomatic bacteriuria in pregnancy is advanced maternal age (Ansari, 2011).[20] Women with advanced maternal age would have given birth to many children, prior to the present pregnancy. Most cases of asymptomatic bacteriuria were found during the third trimester of pregnancy (53.12%) when compared to the first (28.12%) and second trimester (18.75%) (Table 2). The result of this study correlates with other studies done by Girishbabu et al., (2011) and Sentinath et al., (2013).[18,13]

Various Indian studies have shown an incidence of 4 to 23.9 % .[14] In the present study, out of 380 pregnant women, 30 samples were contaminated and 32 of them had asymptomatic bacteriuria, showing 9.1% occurrence of asymptomatic bacteriuria. This is similar to the studies done by Balamurugan (2012)and Sentinath (2013).[13,16] Another study by Jain et al., (2013), shows a prevalence rate of 11 %.[17]

The various factors that contribute to the acquisition of asymptomatic bacteriuria in antenatal women include: hormonal changes during pregnancy, the gravid uterus sits directly on the top of the bladder and displaces it and leads to urinary stasis (Lavanya, 2002).[7] In the present study, it was observed that pregnant women in the age group 25-29 years had highest

percentage of asymptomatic bacteriuria. This results correlates with studies of Ajayi et al., (2012); Girishbabu et al., (2011) and Kerure et al., (2013).[14,18,19]

The most common organism causing asymptomatic bacteriuria in the present study was *Escherichia coli* which correlate with the studies of Girishbabu et al., (2011) and Lavanya (2002).[7,18] Other organisms isolated were *Staphylococcus saprophyticus, Staphylococcus aureus, Enterococcus faecium, Klebsiella pneumoniae* and *Acinetobacter baumannii* .
With regards to the antimicrobial susceptibility pattern, the most effective in-vitro agents were gentamicin among injectables and nitrofurantoin among orally administered ones. Most of the organisms were resistant to ciprofloxacin, clindamycin, ceftriaxone and cotrimoxazole. These findings are in agreement with various other studies (Ahmed, 2011).[21] Various studies have observed that oral nitrofurantoin is a good choice to treat asymptomatic bacteriuria in antenatal women (Perera, 2012).[22] In our study, both the gram positive cocci and gram negative bacilli showed good sensitivity to nitrofurantoin (Table 5 and Table 6).
Although urine culture is considered to be the gold standard for detection of asymptomatic bacteriuria, it is time consuming and requires trained personnel and good laboratory facilities.

CONCLUSION

The present study showed that 9.1% of the antenatal women examined, had a positive urine culture, without any symptoms ofUTI (asymptomatic bacteriuria). Antenatal women in third trimester had the highest occurrence of asymptomatic bacteriuria. Hence, it is important to screen for asymptomatic bacteriuria in pregnancy, not only in first trimester but in all the trimesters. All the pregnant women should be educated about proper personal hygiene as it is one of the risk factor leading to asymptomatic bacteriuria .The antenatal women who are detected to have asymptomatic bacteriuria should be counselled and treated with proper antibiotics in order to avoid adverse maternal and fetal outcomes associated with untreated asymptomatic bacteriuria.

REFERENCES

1. Hankins GD, Whalley PJ. Acute urinary tract infections in pregnancy. Clin Obstet Gynaecol 1985;28:266-78.
2. Cunningham FG, Gant NF, Laveno KJ. Renal and urinary tract disorders. Williams Obstetrics. 24thEd. New York: McGraw-Hill Medical Publishing Division 2014;1052-6.
3. Jaylakshmi J, Jayaram VS. Evaluation of various screening tests to detect asymptomatic bacteriuria in pregnant women. Indian J Pathol Microbiol2008;34(6):699-707.
4. Lata CR, Anil K , Kamlesh T,Kiran MK, Anuradha S, Smriti C. Prevalence of pregnancy associated asymptomatic bacteriuria: A study done in a Tertiary care hospital. J Obstet Gynaecol India 2012;62(5):511-4.
5. Delzell JE, Lefevre ML. Urinary tract infections during pregnancy. Am Fam Physician 2000;61:713-21.
6. Marahatta R, Acharya DB, Pradhan P. Asymptomatic bacteriuria among pregnant women visiting Nepal Medical College Teaching Hospital, Kathmandu,Nepal. Nepal Med Coll J 2011;13(2):107-10.
7. Lavanya SV, Jogalakshmi D. Asymptomatic bacteriuria in antenatal women. Indian J Med Microbiol 2002;20(2):105-6.
8. Ali MAH, Athab SS, Salih HI, Abdulla AS. Detection of asymptomatic bacteriuria by nitrate and leukocyte esterase versus urine culture in pregnancy. Iraqi Med J 2017; 63(2):164-71.
9. Gayathree L, Shetty S, Deshpande SR, Venkatesh DT. Screening for asymptomatic bacteriuria in pregnancy: An evaluation of various screening tests in Hassan District Hospital, India. J Clin Diagn Res 2010; 4(4):2702-6.
10. Thakre SS, Dhakne SS, Thakre SB, Thakre AD, Ughade SM, Kale P. Can the Griess nitrate test and a urinary pus cell count of ≥ 5 cells per micro litre of urine in pregnant women be used for the screening or the early detection of urinary tract infections in rural India? J Clin Diagn Res 2012; 6(9):1518-22.
11. Etminan-Bakhsh M, Tadi S, Darabi R. Asymptomatic bacteriuria in pregnant women attending Boo-Ali Hospital Tehran Iran: Urine analysis vs. urine culture. Electron Physician. 2017; 9(11):5760-63.
12. Demilie T, Beyene G, Melaku S, Tsegaye W. Diagnostic accuracy of rapid urine dipstick test to predict urinary tract infection among pregnant women in Felege Hiwot Referral Hospital, Bahir Dar, North West Ethiopia. BMC Res Notes.2014; 7:481.
13. Senthinath Jayaseelan T, RajalakshmiChitra P, Vigneshwari RS, Revathi P, Prabhu N and Susethira AR (2013). Prevalence of asymptomatic bacteriuria among antenatal women in rural tertiary care hospital, Tamilnadu, India. International Journal of Current Microbiology and Applied Sciences 2(1) 80-85.
14. Ajayi AB, Nwabuisi C, Aboyeji AP, Ajayi NS, Fowotade A and Fakeye OO (2012). Asymptomatic Bacteriuria in Antenatal Patients in Ilorin, Nigeria. Oman Medical Journal 27(1) 31-35.
15. Harshika YK, Kashid RA and Sangeetha S. Asymptomatic bacteriuria and pyuria in antenatal women: risk factors, screening tests and microbiological profile. IJBAMS 2015; 5(2): 222-32.
16. Balamurugan S, Shah Chaitanya, Jayapriya S, Jeya M and Ramesh Rao K (2012). Reagent strip testing (RST) in pregnant women: A cost effective screening tool in under resourced settings. J of Clinical and Diagnostic Research 6(4) 671-673.
17. Jain SA, Pandya JM, Mehta SJ, Jain AG, Kikani KM and Pandya MR (2013). Evaluation of Asymptomatic Bacteriuria in Antenatal women at CU Shah Medical College and Hospital, Surendranagar, Gujarat. International Journal of Medical Science and Public Health 2(4) 1022-24.

18. Girishbabu RJ, Srikrishna R and Ramesh ST (2011). Asymptomatic bacteriruria in pregnancy. International Journal of Biological and Medical Research 2(3) 740-742.
19. Kerure SB, Surpur R, Sagarad SS, Hegadi S. Asymptomatic bacteriuria among pregnant women. Int J Reprod Contracept Obstet Gynecol 2013; 2(3):213-16.
20. Ansari HQ and Rajkumari Aruna (2011). Prevalence of asymptomatic bacteriuria and associated risk factors among antenatal women attending a tertiary care hospital. Journal of Medical and Allied Sciences 1(2) 74-78.
21. Ahmad Shamweel, ShakoohShehla, Salati Ahmad Sajad and Muniem Abdul (2011). Prevalence of asymptomatic bacteriuria among pregnant women in Kashmir. Sri Lanka Journal of Obstetrics and Gynaecology 33 158-162.
22. Perera Jennifer, Cyril Randeniya, PiyumiPerera, NimeshaGamhewage and JayalathaarachchiRenuka (2012). Asymptomatic bacteriruria in pregnancy: Prevalence, risk factors and causative organisms. Sri Lankan Journal of Infectious Diseases 1(2) 42 – 46.