

Prevalence of Asymptomatic Bacteriuria in Pregnancy

Nida Abbas ¹, Rubia Javaid ², Saira Gul ³

¹ Medical officer, BHU, Khajula, Chakwal.

² Medical officer Benazir Bhutto Hospita, Rawalpindi.

³ Medical officer DHQ, Attock

ABSTRACT

Objective: The present study aimed at estimating the prevalence of asymptomatic bacteriuria during pregnancy.

Patients and Methods: This descriptive cross-sectional study was conducted in pregnant women coming for antenatal checkup to IYB Headquarter Hospital Attock during March-June 2017. After taking informed consent, urine samples of 180 pregnant females were collected and subjected for culture. Growth of $>1 \times 10^5$ CFU/mL was considered as significant bacteriuria. Isolates were identified using standard microbiological methods.

Results: Out of total 180 samples, 16 showed significant bacteriuria, thus prevalence was calculated to be 8.89%. Asymptomatic bacteriuria had no significant relationship with age, gravidity and trimester of pregnancy. Escherichia coli was the most common isolated bacteria (43.75%).

Conclusion: Due to high prevalence of asymptomatic bacteriuria and its associated adverse complications, urine culture should be made essential part of antenatal investigations.

Keywords: Asymptomatic bacteriuria, Pregnant women, Urine culture.

Author's Contribution

¹ Conception, synthesis, planning of research and manuscript writing

² Interpretation and discussion

³ Data analysis, interpretation and manuscript writing, Active participation in data collection

Address of Correspondence

Saman Waqar

Email. samanwaqar@yahoo.com

Article info.

Received: July 25, 2017

Accepted: August 11, 2017

Cite this article: Abbas N, Javaid R, Gul S. Prevalence of Asymptomatic Bacteriuria in Pregnancy. JIMDC. 2017; 6(2):162-165

Funding Source: Nil

Conflict of Interest: Nil

Introduction

Urinary tract infection is one of the most common infection encountered during pregnancy.¹ It can either present with symptoms or it can be symptomless. Asymptomatic bacteriuria can be defined as presence of 10^5 or more colony forming bacteria per ml of urine in a person without any clinical findings.² The prevalence of asymptomatic bacteriuria in pregnancy is reported to be 2- 11% by various researches.^{3,4} Urine normally present in bladder is sterile due to acidic pH, high urine osmolality and high urea levels inhibiting growth of bacteria.⁵ In pregnancy there are many physiological and morphological changes that

predisposes to asymptomatic bacteriuria. Combination of reduction in immunity, urinary stasis, shortening of urethra, development of glycosuria and urine reflux from bladder into ureter contributes to the development of urinary tract infection.^{6,7} Three common clinical manifestations of UTIs in pregnancy are: asymptomatic bacteriuria, acute cystitis and acute pyelonephritis.⁸

Different factors such as presence of adhesions, stasis produced by the gravid uterus etc. play a role in the causation of UTI.⁹

Untreated asymptomatic bacteriuria can lead to adverse maternal and fetal outcomes. Mother can suffer from

pyelonephritis, cystitis, hypertension, preeclampsia, anaemia and preterm labor while fetal complications include IUGR, prematurity, low birth weight and even death^{3,10,11} As isolation of 10⁵ or more bacteria per ml of urine leads to diagnosis of asymptomatic bacteriuria; urine culture is considered as most suitable method for its detection. Dipstick method can be used may indicate the presence or absence of bacteriuria but the sensitivity of dipstick for nitrites and leucocyte esterase has been found to be quite low.^{4,10} Adverse outcomes of undiagnosed asymptomatic bacteriuria in mother and fetus have made researchers to recommend urine culture as a part of routine investigations in all pregnant women reporting for antenatal checkup to prevent any form of complication timely.⁶ The aim of study was to determine the prevalence of asymptomatic bacteriuria in pregnant women reporting for antenatal checkup to IYB District Hospital Attock and analyze the spectrum of urinary isolates so that health policies can be modified to identify and control asymptomatic bacteriuria and its associated complications.

Patients and Methods

This cross-sectional study conducted on women coming for antenatal checkup at IYB District Hospital Attock during March-June 2017. Approval was taken from ethical review committee of hospital. Considering the 11% prevalence of asymptomatic bacteriuria, as reported by Chukwu OS², calculated sample size was 151 by using formula: $n = \frac{z^2 \times p(1-p)}{d^2}$

Where, n=sample size, Z (confidence level) = 1.96, P (Expected prevalence or proportion) = 11

d (Precision) = 0.05 However, we included 180 women in the study to exclude the possibility of dropouts and to further strengthen the study. Women with burning micturition, fever, history of diabetes, sickle cell trait, pre-eclampsia, vaginal infections, known renal disease, catheterization during last 2 weeks, antibiotic intake during last 2 weeks and known congenital anomaly of urinary tract were excluded from study. Informed consent was taken and they were interviewed for demographic details including age, parity and gestational amenorrhea. They were given instructions regarding collection of mid-stream urine. After urine collection in

sterile, wide mouthed container covered with a tightly fitted lid, it was labeled and processed on the same day. First physical examination of sample was done then with a Calibrated micro-loop 0.001ml of urine was cultured on a Blood agar, CLED & Mac Conkey agar plates. After 24 hours of incubation, bacterial growth of 10⁵ or more was considered significant. Colony morphology, gram staining, motility test, catalase test, oxidase test, coagulase test, and other standard microbiological procedures were used to identify the isolates. Data was analyzed using SPSS 22. Chi-square test was applied. P-value less than 0.05 was considered statistically significant.

Results

Out of total 180 samples, 16 showed significant growth which indicate the frequency of 8.89 %. The occurrence of asymptomatic bacteriuria in pregnant women according to the age groups is shown in Table 1.

Table 1: Association of asymptomatic bacteriuria with age, trimester and gravidity (n=180)

Characteristics	Total number of women	Number of women infected	Percentage of women infected	p-value
Age (years)				
15-21	32	1	3.125	0.35
22-28	71	9	12.676	
29-35	53	5	9.43	
36 and above	24	1	4.167	
Trimester				
1 st	65	4	6.14	0.35
2 nd	54	4	7.4	
3 rd	61	8	13.11	
Gravidity				
Primigravida	67	4	5.97	0.28
Multigravida	113	12	10.61	

The frequency was most common in the women between 22- 28 years of age, however, asymptomatic bacteriuria did not show any significant relationship with age. Regarding pregnancy time, highest frequency was found in third trimester, however statistically there was no significant relationship between trimester and bacteriuria. There was high frequency of infection in multigravida or more as compared to primigravidas, though no significant relationship was found between gravidity and bacteriuria (table 1). The commonest isolated organism was Escherichia coli (43.75%), followed by Staphylococcus

aureus (31.25%) (Figure 1).

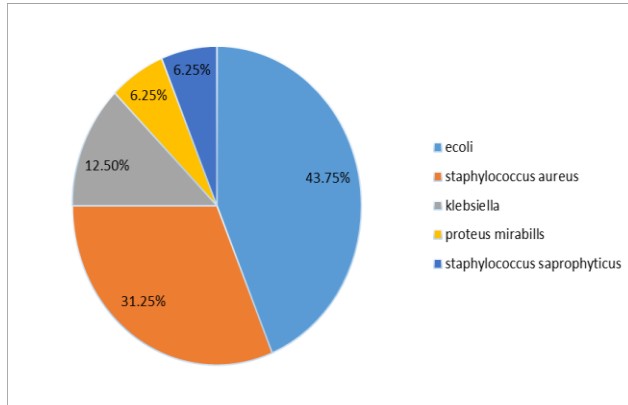


Figure 1: Pattern of urinary isolates in pregnant females (n=180)

Discussion

Urinary tract infection should be dealt with great care both in regards to clinical and laboratory diagnosis and appropriate management. The main problem with ASB is that there are no symptoms and thus remains undiagnosed. Timely diagnosis and management can greatly help to prevent maternal and fetal complications. Our study showed the prevalence of asymptomatic bacteriuria to be 8.89% which coincides to finding of 8.2% reported by Radha S ,et al.⁹ Our findings are also comparable to those reported by Abdel-Aziz Elzayat M, et al as 10% of their study population were diagnosed with ASB.¹¹ In contrast to our study, the incidence of ASB was calculated to be 25% in Nigeria and 45.3% in benin city, Nigeria.^{6,12} Difference in geographical locations, ethnicity and hygienic practices might be contributing factors in difference of incidence of ASB from one place to another .The act of ablution performed by muslims after micturation and defecation may have protective role against asymptomatic bacteriuria.

Our study showed increased prevalence of infection in women belonging to age groups of 22-28 years (12.676%) followed by 29-35yrs (9.43%) and least in age group of 15-21 years. However, no statistical association of SB was found with age. Similar pattern was observed in other studies.^{9,11} This could be due the fact that women belonging to this age group are sexually active ,use contraceptive methods. In contrast Hazir showed increased incidence in younger age group(less

than 20) with maternal age significantly lower in cases with asymptomatic bacteriuria.³ A study conducted in southern Ethiopia showed highest rate of ASB in the age group ≥ 35 years and the lowest was in the age group of 25–34 years.¹³ Our study showed an increased prevalence of infection with increasing gestational age and it was more frequently observed in the third trimester of pregnancy(13.1%). The lowest frequency was observed in the first trimester of pregnancy, (6.1%). This is in agreement with Tugrul S¹⁴, and Parveen⁸ who reported an increased frequency of urinary tract infection in the third trimester compared to the first and second trimester of pregnancy. However, this report does not agree with Abdel-Aziz Elzayat M et al,¹¹ and Onuh et al¹⁵ who reported a higher prevalence of urinary tract infection in the second trimester compared to the third trimester. Other studies suggest that the incidence and the risk of acquiring bacteriuria enhances along with the progression of pregnancy from 0.8% at the end of first trimester to 2% at the end of pregnancy.¹⁶

Multigravidas women had the highest frequency of asymptomatic bacteriuria affecting 9.73 % of the total number of multigravida included in the study. The higher incidence of ASB in multigravida showed positive correlation with the studies by Obirikorang C.¹⁷ The descent of pelvic organs associated with multiple pregnancies leads to the widening of the urethral orifice thus making ascend of microorganisms easier. These changes differ from patient to patient and are more likely to occur in women who have less gap in pregnancies. The most common uropathological isolate found in our study was Escherichia coli (43.75 %). Similar result was reported by Gayathree et.al¹⁸ and Ade-Ojo IP.¹⁹ The dominance of Escherichia coli reported in one was as high as 86 %.⁸ The second most prevalent pathogen found in our study was S. aureus (31.25 %).This result corresponds with finding of Imade et al¹² and Samuel S et al.⁶ In contrast a study conducted in Kanu showed Klebsiella and Staphylococcus saprophyticus to be most common uropathogen.²⁰ Thus there is difference in dominance of uropathological organisms responsible for ASB from place to place, highlighting the importance of urine culture help to identify exact causative organism.

Conclusion

Our study showed prevalence of ASB to be 8.89%, which is quite high. There was no significant relationship with age, parity and trimester. *Escherichia coli* was found to be most dominant uropathogen. To safeguard maternal and fetal health, urine culture should be recommended to all pregnant ladies so that appropriate management can be initiated timely.

References

1. Mittal P, Wing DA. Urinary tract infections in pregnancy. *Clinics in perinatology*. 2005;32(3):749-64.
2. Chukwu OS, Ezeonu IM, Victor MA, Moses NA, Uchenna UG, Owolabi JO, Olaosebikan OO. Incidence, Aetiology and Antibiotic Susceptibility Profile of Asymptomatic Bacteriuria in Pregnant Women in Nsukka Urban, Enugu State, Nigeria. *World Journal of Life Sciences and Medical Research*. 2014; 3(3):94.
3. Hazhir S. Asymptomatic bacteriuria in pregnant women. *Urology journal* 2009; 4(1):24-7.
4. Kutlay S, Kutlay B, Karaahmetoglu O, Ak C, Erkaya S. Prevalence, detection and treatment of asymptomatic bacteriuria in a Turkish obstetric population. *The Journal of reproductive medicine*. 2003; 48(8):627-30.
5. Perera J, Randeniya C, Perera P, Gamhewage N, Jayalatharchchi R. Asymptomatic bacteriuria in pregnancy: prevalence, risk factors and causative organisms. *Sri Lankan Journal of Infectious Diseases*. 2012; 2(1):41-45
6. Samuel O, Victoria O, Ifeanyi O. Prevalence of Asymptomatic Bacteriuria among the Pregnant Women Receiving Antenatal Care at Federal Medical Centre Owerri, Nigeria. *Universal Journal of Clinical Medicine*. 2016; 4(1):1-5.
7. Marahatta R, Dhungel BA, Pradhan P, Rai SK, Choudhury DR. Asymptomatic bacteriuria among pregnant women visiting Nepal Medical College Teaching Hospital, Kathmandu, Nepal. *Nepal Med Coll J*. 2011; (2):107-10.
8. Parveen K, Momen A, Begum AA, Begum M. Prevalence of urinary tract infection during pregnancy. *Journal of Dhaka National Medical College & Hospital* 2012; 17(2):8-12.
9. Radha S, Nambisan B, Prabhakaran NK, Jamal S. Prevalence and outcome of asymptomatic bacteriuria in early pregnancy. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* 2016; 6(1):223-7.
10. Mignini L, Carroli G, Abalos E, Widmer M, Amigot S, Nardin JM, Giordano D, Meriardi M, Arciero G, Del Carmen Hourquescos M. World Health Organization Asymptomatic Bacteriuria Trial Group Accuracy of diagnostic tests to detect asymptomatic bacteriuria during pregnancy. *Obstet Gynecol*. 2009; 113:346-52.
11. Elzayat MA, Barnett-Vanes A, Dabour MF, Cheng F. Prevalence of undiagnosed asymptomatic bacteriuria and associated risk factors during pregnancy: a cross-sectional study at two tertiary centres in Cairo, Egypt. *BMJ open* 2017; 7(3):e013198.
12. Imade PE, Izeke PE, Eghafona NO, Enabulele OI, Ophori E. Asymptomatic bacteriuria among pregnant women. *North American Journal of Medical Sciences* 2010; 2(6):263.
13. Tadesse E, Teshome M, Merid Y, Kibret B, Shimelis T. Asymptomatic urinary tract infection among pregnant women attending the antenatal clinic of Hawassa Referral Hospital, Southern Ethiopia. *BMC research notes* 2014; 7(1):155.
14. Tugrul S, Oral O, Kumru P, Köse D, Alkan A, Yildirim G. Evaluation and importance of asymptomatic bacteriuria in pregnancy. *Clinical and experimental obstetrics & gynecology* 2004 ;32(4):237-40.
15. Onuh SO. Microbiological isolates and sensitivity pattern of urinary tract infection in pregnancy in Benin City, Nigeria. *Ebonyi Medical Journal* 2006; 5(2):48-52.
16. Nicolle LE. Asymptomatic bacteriuria: when to screen and when to treat. *Infectious disease clinics of North America* 2003; 17(2):367-94.
17. Obirikorang C, Quaye L, Bio FY, Amidu N, Acheampong I, Addo K. Asymptomatic Bacteriuria among Pregnant Women Attending Antenatal Clinic at the Uni-versity Hospital, Kumasi, Ghana. *Journal of Medical and Biomedical Sciences* 2012; 1(1):38-44.
18. Gayathree L, Shetty S, Deshpande SR, Venkatesha DT. Screening for asymptomatic bacteriuria in pregnancy: An evaluation of various screening tests in Hassan District Hospital, India *JCDR* 2010; 4(4):2702-6.
19. Ade-Ojo IP, Oluyeye AO, Adegun PT, Akintayo AA, Aduloju OP, Olofinbiyi BA. Prevalence and antimicrobial susceptibility [sic] of asymptomatic significant bacteriuria among new antenatal enrollees in Southwest Nigeria. *Int Res J Microbiol* 2013; 4:197-203.
20. Aminu KY, Aliyu UU. Asymptomatic bacteriuria in pregnant women in the antenatal booking clinic at Aminu Kano Teaching Hospital, Kano, Nigeria. *Open Journal of Obstetrics and Gynecology* 2015 ;5(05):286.