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ORIGINAL ARTICLE

Frequency of Asymptomatic Bacteriuria and its Causative Organisms among Pregnant Women Visiting for Antenatal Checkup in Outpatient Department of Sims/Services Hospital

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ABSTRACT

Objective: The purpose of this study was to assess the frequency of asymptomatic bacteriuria and causative organisms that are responsible for the development of bacteriuria in pregnant women visiting antenatal checkup in outpatient Department in hospital.

Methodology: This was a Cross sectional study conducted in the Outpatient department of Gynecology, SIMS/Services Hospital, Lahore after taking ethical approval. The duration of the study was about six months. Non-probability purposive sampling technique was used in the study. Any gestational age, all pregnant women with no clinical symptoms of bacteriuria were included in the study. Frequency and percentages was determined for qualitative data like asymptomatic bacteriuria and causative agent (i.e., Staph Aureus, E.coli, Klebsiella pneumonae).

Results: A total of 220 pregnant women were selected. Their mean age were reported 26.12±4.08 years ranging from 17-37 years. Culture and sensitivity results confirmed 16(7.3%) cases with asymptomatic bacteriuria. Among 16 positive cases, E.coli was the predominant organism isolated in 8(50%) samples followed by Staphylococcus aureus in 4(25%) samples, Klebsiella in 1(6.25%), Candida Species in 1 (6.25%) and mixed growth in 2(12.5%) sample were detected in urine culture and sensitivity test.

Conclusion: This study concludes that frequency of asymptomatic bacteriuria was uncommon amongst those pregnant women who attended for antenatal checkup. Most predominant pathogen isolated from culture was Escherichia coli followed by Staphylococcus aureus.

Keywords: Bacteriuria, Escherichia coli, Staphylococcus aureus

INTRODUCTION

The prevalence of urinary tract infection in pregnant women varies from 4-7%, and up to 40% of the effected women will progress to symptomatic urinary tract infection in pregnancy (1). Generally, Urinary Tract Infections (UTIs) happen in pregnancy because of the physiological and morphological alterations that occur in the genitourinary tract. There are two types of UTIs; symptomatic and asymptomatic. Asymptomatic Bacteriuria (ASB) is described as the existence of proliferation of bacteria dynamically, which is more than 105/ml of urine in the urinary tract, not including the distal urethra, at a time with the patient devoid of symptoms of UTI(2). ASB can exist in both non-pregnant and pregnant women. The occurrence of ASB was observed to be 2-11% in women with pregnancy. Pregnancy boost the development from ASB to symptomatic bacteriuria, if it is left untreated it leads to develop acute pyelonephritis in about 20-50% of cases and progress to unfavorable obstetric consequences for example prematurity, anemia, postpartum hypertensive disease, UTIs, and higher mortality rates of fetus(3).

This infection affects all the age groups in females in the same way but women are more susceptible due to shorter length of urethra, lack of prostatic secretions and eventually contamination of the urinary tract with fecal microorganism. Moreover, additional risk factor is pregnancy(4) UTI is investigated by the complete urine examination for the detection of pus cells and for culture sensitivity. A normal urine sample is disinfected. While the presence of bacteria in urine termed as bacteriuria(5) Prevalence of bacteriuria in pregnant women is similar as in non-pregnant women but a probability of complication of UTI for example acute pyelonephritis rises in pregnancy (6).

Diagnosis of Asymptomatic bacteriuria is accomplished by the isolation of a particular quantitative count of bacteria in a sample of urine which is appropriately collected from a pregnant woman with no signs or symptoms. Hence, for ASB the gold standard screening method is urine culture that takes place during pregnancy(7) During pregnancy, the leading organism that leads to UTIs is Escherichia coli that form 80% to 90% infections (8).The incidences of isolated pathogens and their patterns of antimicrobial resistance can differ in different geological areas(9). Untreated Asymptomatic bacteriuria causes the increase of symptomatic cystitis in about 30% of patients and can bring about the progression of pyelonephritis in up to 50% of patients(10) .Asymptomatic bacteriuria is related to a risk of increased intra-uterine growth retardation and low weight of newborns at the time of birth(11) . During pregnancy, comparatively high occurrence of asymptomatic bacteriuria than the symptomatic bacteriuria, the significant results can be achieved in pregnant women by timely screening and management for bacteriuria. Screening and treatment of asymptomatic bacteriuria will reduce the occurrence of pyelonephritis (12).

METHODOLOGY

This was a cross sectional study conducted in the Outpatient department of Gynecology Floor, SIMS/Services Hospital, Lahore after taking ethical approval. The duration of the study was about six months. Non-probability purposive sampling technique was used in the study. A total of 220 cases of pregnant women were enrolled for the study that had visiting for antenatal examination in outpatients department of Gynecology of the hospital.

Pregnant women with any gestational age whose written consent was received with no clinical symptoms of bacteriuria e.g., dysuria, urgency, and frequency etc., were included for the study. The pregnant women having symptoms of urinary tract infection history e.g., dysuria, urgency, and frequency etc., gestational diabetes mellitus, hypertension induced by pregnancy, pyrexia, history of antibiotic treatment before 2 weeks, and identified inherited abnormalities of the urinary tract were excluded from the study.

Urine sample was sent to microbiology laboratory of Services Hospital. Analysis was performed by taking 10ml to 15ml mid-stream urine for complete urine assessment for the identification of pus cells and sensitivity of a culture. Standard microbiological methods were applied in the culture of all specimens of mid-stream urine and in the detection of the isolates. Colony counts, equal to or > 10^5/ml were taken as significant growth. All these details were gathered by a specially designed proforma.

The collected data was entered into SPSS version 16. Frequency and percentages were calculated for qualitative data e.g., asymptomatic bacteriuria and causative agent i.e., E.coli, Staph Aureus, Klebsiella pneumonae, while quantitative data e.g., age was shown as mean ±SD.

RESULTS

A total of 220 pregnant women were selected. Their mean age was reported to be 26.12±4.08 years ranging from 17-37 years. Regarding distribution of patients in relation to Gravida (G), there were 77(35%) women who were primigravida (G0), 47(21.36%) women were G2, 45(20.45%) women were G3, 22(10%) women were G4, 13(5.91%) women were G5 and 16(7.2%) women had >G6. In terms of distribution of women with relation to Parity (P), there were 95(43.18%) women with P0, 45(20.45%) with P1, 33(15%) with P2, 22(10%) women with P3, 14(6.36%) women with P4, 9 (4.09%) women with P5 and only 2(0.91%) women with P6..

Mean duration of pregnancy for women was found to be 28.08±6.47 weeks. (Table-I)

Urine complete examination test shows that 27(12.27%) women were positive with bacteriuria among 220. For further confirmation culture was also done. Culture and sensitivity test confirmed 16(7.3%) cases with asymptomatic bacteriuria.

Among 16 positive cases E.coli was the predominant organism isolated in 8(50%) samples followed by Staphylococcus aureus in 4(25%) samples, Klebsiella 1(6.25%), Candida Species in 1 sample (6.25%) and mixed growth in 2(12.5%) sample were detected in urine culture and sensitivity test, as shown in Table-II, Fig-I.

Table 1: Descriptive Statistics and general features of patients

Variable		Mean±S.D
Age (Years)		26.12±4.08
Duration of Pregnancy (Weeks)		28.08±6.47
Gravida	G0	77(35.0%)
	G2	47(21.36%)
	G3	45(20.45%)
	G4	22(10.0%)
	G5	13(5.91%)
	G6	16(7.2%)9
Parity status	P0	95(43.18%)
	P1	45(20.45%)
	P2	33(15.0%)
	P3	22(10.0%)
	P4	14(6.36%)
	P5	9(4.09%)
	P6	2(0.91%)

Table 2: Results of Complete Urine Examination (n=220)

Variable		n	%
Complete Urine Examination (Pus Cells)	Positive	27	12.27
	Negative	193	87.73
Urine Culture	Positive	16	7.3
	Negative	204	92.7
Microorganism	E.coli	8	50.0
	Staph. Aureus	4	25.0
	Klebsiella	1	6.25
	Candideal Species	1	6.25
	Mixed Growth	2	12.5
Total		16	100

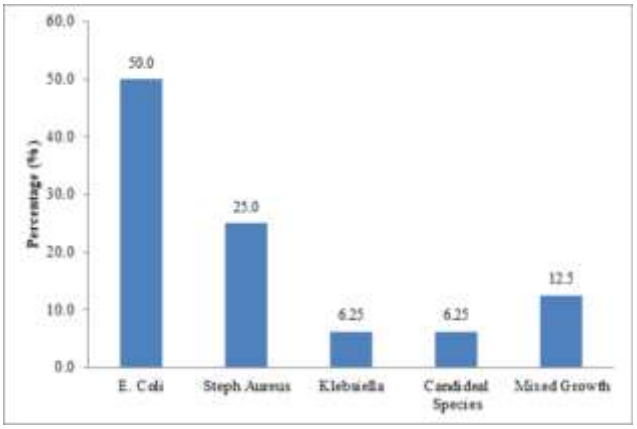

Fig 1: Frequency of detected microorganism in urine culture

DISCUSSION

Asymptomatic bacteriuria (ASB) in pregnancy is one of the most imperative causative factors resulting in low birth weight infants, UTIs after giving birth and higher rates of fetal mortality. Women with bacteriuria had a 20 to 50 folds augmented risk of developing pyelonephritis than the women with no bacteriuria .The present study demonstrated the prevalence of asymptomatic UTIs in pregnant women. Therefore, timely diagnosis of UTIs prevents the premature or low birth infants.

One study revealed that the low incidence of asymptomatic bacteriuria was reported in 7.3% women, (13) which was comparable to those found in numerous other researches(14, 15) Furthermore, more researchers including Neupane et al., (26%) and Imade et al., (45.3%)

revealed a higher frequency(16) This difference may be elucidated by the evidence that there were variations in the atmosphere, social behavior of the population, socio-economic conditions, and the principles of individual hygiene and patient's education. As far as our study is concerned, our study shows the low prevalence of 16(7.3%) for asymptomatic bacteriuria.

Similarly, another study reported the prevalence of infection in different age groups and revealed that from 21 to 30 years of age group, the occurrence of infection was high and was observed in 72.72%, subsequently 31 to 40 years (18.18%). Alghalibi et al.,(17) revealed a higher incidence of UTIs in pregnant women under the age of 21-25 years, wherein the study of Turpin et al.,(18) showed increased prevalence in women with pregnancy between the age of 35-39 years. It was also reported that advanced maternal age i.e., ≥35years has a risk of asymptomatic bacteriuria(19) Our study was inconsistent with the above mentioned studies and reported that a higher prevalence of ASB in pregnant women who were aged between 17-37 years.

One more study reported the higher frequency of asymptomatic bacteriuria was found in multigravidae (51.1%),that was comparable to Obirikorang et al.'s outcomes(20) .As far as the present study is concerned, frequency of bacteriuria was higher in primigravida 77(35%) followed by 47(21.36%) women with Gravida-2 that was inconsistent with the above mentioned studies.

In the study of Yashodhara et al., showed an increased rate of infection was observed in first trimester of pregnancy. Turpin et al., revealed a high frequency rate of asymptomatic bacteriuria in the first and early second trimesters of pregnancy and acknowledged it to pregnant women who visited at the antenatal checkup during these periods(18). The higher frequency of asymptomatic bacteriuria in the first trimester of pregnancy can happen due to the hormonal changes.. Our study was inconsistent with the above cited studies and revealed that frequency of bacteriuria was mostly reported in second and third trimester of pregnancy.

The bacterium that leads to asymptomatic bacteriuria has faecal origin, which inhabits the area of periurethra. Studies by Chandel et al.,(18) Enayat et al.,(15) Obirikorang et al.,(20) Khattak et al.,(21) ,Jain et al.,(22) and Senthinath et al.,(23) have reported that Escherichia coli was the most common isolated pathogen, found in their culture test. Our study was consistent with the above mentioned studies and reported that most common microorganism in urine culture was found to be Escherichia coli in 8(50%) cases out of 16 followed by the Staphylococcus aureus in 4(25%) cases.

Therefore, it is suggested that a urine culture screening should be performed routinely for all pregnant women visiting for antenatal checkup in order to save the mother and fetus from any type of complications that may occur due to infection.

CONCLUSION

The present study concludes that the frequency of asymptomatic bacteriuria was lower amongst pregnant women who visited for antenatal checkup. Furthermore, most predominant pathogen isolated from culture was Escherichia coli followed by Staphylococcus aureus, Klebsiella and Candida species.

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