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Frequency Survey of Asymptomatic Bacteriuria in Pregnant Women Attending Boo-Ali Hospital, Tehran

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Abstract

Background: During pregnancy, asymptomatic bacteriuria is associated with different complications such as pyelonephritis and preterm birth. Pregnancy changes pave the way for the growth and multiplication of pathogenic factors. This study was aimed at exploring the frequency of asymptomatic bacteriuria among pregnant women who attended Boo–Ali Hospital, a teaching center of Islamic Azad University in Tehran. **Materials and Methods:** This cross-sectional study was performed on 123 pregnant women without urinary symptoms who attended Boo–Ali Hospital from March 2013 to September 2014. Demographic information of the patients including age, gestational age at the time of experiment and parity were recorded. An amount of middle part of urine (20cc) was collected in an appropriate sterile container. Urine samples were examined for WBC, RBC and bacteria. Other parts of the samples were cultivated for urine culture (U/C). **Results:** Two (1.6%) women had significant bacteriuria (≥105/ml). Pyuria, bacteriuria and hematuria were seen in 49(39.8), 7 (5.6%) and 8 (6.5%) women, respectively. There was a significant association between positive U/C and pyuria (P=0.003). However, positive U/C showed no significance association between bacteriuria and hematuria (P>0.05). **Conclusion:** Regarding the low frequency of asymptomatic bacteriuria (less than 2%) in the investigated population, the administration of U/C does not seem logical for all pregnant women. Hence, U/C is recommended for those with significant pyuria in their urinalyses. **[GMJ.2015;4(4):159-63]**

Keywords: Asymptomatic Bacteriuria; Pregnancy; Frequency; Pyuria; Screening

Introduction

Asymptomatic bacteriuria refers to the growth of bacteria (≥105 colony per ml) in the urine of a person without symptoms [1]. During pregnancy, some factors have been suggested which may provide predisposal conditions for growth of normal flora and other pathogens such as; impaired immune system, anatomic changes in the urinary system following hormonal changes, excretion glucose and amino acids in the urine [2,3]. Asymptomatic bacteriuria during pregnancy can lead to symptomatic urinary tract infection (UTI), pyelonephritis and postpartum UTI. Untreated UTI in pregnancy is related to adverse obstetric outcomes such as preterm birth and low birth weight [4].

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Due to the complications of asymptomatic bacteriuria in pregnancy, examining the presence of microorganism in the urinary system via urine culture is recommended for all pregnant women [5].Previous studies have shown that the prevalence of asymptomatic bacteriuria in pregnant women is 7% to 86% [6-11]. Furthermore, the prevalence of asymptomatic bacteriuria was reported higher in women of lower social and economic classes, women with the history of UTI, older mothers and increasing gestational age (GA) and parity [11, 12, and 13].On the other hand, costly procedures of urine culture (U/C) and prolonged result preparation have made some countries substitute test-tape for urine culture; however, urine test-tape is incapable of assessing urine infection, contrary to urine culture.As a result, it cannot help the physician select antibiotics. Regarding the frequency of infection in target population, U/C matters for its cost-effectiveness.Considering the wide variety of data on asymptomatic bacteriuria among Iranian pregnant women, this study was conducted to explore the frequency of asymptomatic bacteriuria among pregnant women who attended Boo–Ali Hospital, a teaching center of Islamic Azad University in Tehran.

Materials and Methods

Subjects

This cross-sectional study was performed on 123 pregnant women who attended Boo–Ali Hospital, a teaching center of Islamic Azad University in Tehran, Iran from March 2013 to September 2014. The study was approved by the ethical committee of Islamic Azad University, Tehran Medical Sciences Branch. Written informed consent for participation was obtained. Women with any symptom or sign of UTI, genito-urinary complaints and a history of intake of antibiotics during the past 1 week were excluded.

Data Collection

Demographic and clinical information of the subjects recorded include maternal age, gestational age at the time of experiment, parity, education level and occupational status. A "Clean Catch" mid-stream urine sample was collected inside sterile disposable universal bottles after giving proper instruction on how to collect samples and the need for prompt delivery to the laboratory. Samples were labelled and transported to the Medical Microbiology and Parasitology laboratory of Boo-Ali Hospital and were analyzed within 30 min. to 1 h of collection.

Urine Analysis and Urine Culture

A loop full of well-mixed urine sample was inoculated into duplicate plates of Blood and MacConkey agar. All plates were then incubated at 37oC aerobically for 24h. The plates were then examined macroscopically and microscopically for bacterial growth. The bacterial colonies were counted and multiplied by 100 to give an estimate of the number of bacteria present per milliliter of urine. A significant bacterial count was taken as any count equal to or in excess of 100,000 cfu /ml.

Urine samples were mixed and aliquots centrifuged at 5000 rpm for 5 min. The deposits were examined using both x10 and x40 objectives. Samples with 5 white blood cells/ mm3 were regarded as pyuria. A volume of urine samples was applied to a glass microscope slide, allowed to air dry, stained with gram stain and examined microscopically. Bacterial isolates were identified generally using a battery of tests.

Statistical Analysis

Data were analyzed by statistical software Statistical Package for the Social Sciences (SPSS) version 14.0 (SPSS Inc, Chicago, IL) using Chi-square and Fisher's Exact tests. Significant difference was set at P=0.05.

Results

A total of 123 pregnant women were included in this study. The mean ± SD age of the pregnant women was 28±5.14 (range, 16-38 years). Significant asymptomatic bacteriuria (≥105/ml) was found in the urine of 1.6% of 123 women tested and asymptomatic bacteriuria (>104/ml) was detected in 6.5% of these women.

Of 123 women, 82 were in the age group of 16-30 years and 41were between the ages of 31-38 years. Culture positivity was seen in 2 women and in 6 women in 16-30 and 31-38 age groups, respectively. Table 1 shows demographic data of these participants. Although increasing maternal age and gestational age increase the frequency of asymptomatic bacteriuria, there was no significant difference between infected and healthy people in terms of parity, education level and occupational status.

Regarding table 2, 49(39.8%) women had pyuria in urine analysis. In addition, bacteriuria and hematuria were seen in 7 (5.6%) and 8 (6.5%) women, respectively. There was no significant correlation between bacteriuria and positive U/C (P=0.06). However, there was a significant association between positive urine culture (U/C) and pyuria (P=0.003) (Table2).

Discussion

In the present study, the frequency of significant asymptomatic bacteriuria was 1.6% that is lower than all previous reports. Previous studies conducted on the frequency of asymptomatic bacteriuria in pregnant women showed different results. The prevalence of asymptomatic bacteriuria was reported 86.6% (2001) and 45.3% (2010) in Benin [19], 23.9% (1993) in Nigeria, 14.2% in Saudi Arabia [14], 7% (2007) in Ethiopia and 7.3% (2007) in Ghana. In Iran, this rate was reported as 10.1% in a study in Hamedan (2009),

Table1. Association between Urine Cultures with some Characteristics of all Surveyed Women

	N (%)	Positive Culture N (%)	P value
Age (year)	16 to 30 years	2(2.43)	0.01
	31 to 38 years	6(14.63)	
Education Level	Illiterate	0	0.7
	School	7(7.3)	
	Academic	1(4)	
Occupational Status	Housewife	8(7.2)	0.6
	Employed	0(0)	
GA(week)	5 to 20 week	1(1.4)	0.009
	21 weeks and above	7(14)	
Parity	0-1	6(5.3)	0.1
	2	2(22.22)	

Table2. Association between U/C with Urine Parameters of all Surveyed Women. Data were presented as number (Percent).

Urine Parameters			Positive U/C N (%)	P value
Pyuria	Yes	49(39.8)	8(16.3)	0.003
	No	74(60.1)	0(0)	
Hematuria	Yes	8(6.5)	0(0)	0.2
	No	115(93.5)	8(7)	
Bacteriuria	Yes	7(5.6)	4(57.1)	0.06
	No	116(94.4)	4(3.4)	

about 7.5% in a study in Mirza Kouchak Khan Hospital in Tehran (2000) and 3.7% in a study in an educational outpatient center in Gorgan (2000) [15]. It seems that this frequency differs based on social and economic classes and region. Wadland *et al*. (1989) concluded that if the prevalence of significant asymptomatic bacteriuria was higher than 2%, single-time urine cultivation is suitable for examining asymptomatic bacteriuria, but urinalysis is recommended for asymptomatic bacteriurias with lower percentage [16]. In another study into a population with asymptomatic bacteriuria frequency of ≥ 6%, U/C along with urinalysis has been recommended [17].

Regarding diverse frequency of asymptomatic bacteriuria (colony count ≥ 105) in different regions and communities, simultaneous conduction of U/C and urinalysis on all pregnant women does not seem a rational approach.

This study showed a higher frequency of asymptomatic bacteriuria among pregnant women aged 31-38 years. In contrast, in a study by Borumand *et al*. [18] in Tehran, there was no relationship between age and frequency of asymptomatic bacteriuria in diabetic females. On the other hand, there was a significant difference in asymptomatic bacteriuria between the pregnant women of different age groups, according to the studies conducted in Ghana (2001) and Benin (2010). In the same study, parity 4 and higher were associated with greater prevalence of infection; whereas, there was not any significant difference in terms of asymptomatic bacteriuria between the women with parity lower than 2 and 2 in our study.

In addition, the frequency of asymptomatic bacteriuria was higher among women with GA>20 weeks which was consistent with the study conducted in Heidarabad *et al*. (2011) and inconsistent with the study conducted in Nigeria (2010). Our findings showed a correlation between pyuria and asymptomatic bacteriuria in pregnant women, which was consistent with the findings of a study by Borumand *et al*. on non-pregnant diabetic women.

Conclusion

In conclusion, routine urine culture is not recommended for all pregnant women. Thus, urine specimens with pyuria should be sent for culture. We recommend further studies from other centers as well as systematic reviews to be conducted in order to further elucidate the epidemiology of asymptomatic bacteriuria among pregnant and non-pregnant women.

Conflict of Interest

The authors have declared no conflict of interests.

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