



ASYMPTOMATIC BACTERIURIA AMONG PREGNANT WOMEN IN SULAIMANI CITY

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ABSTRACT

The traditional definition of asymptomatic bacteriuria (ASB) is the presence of 100,000 bacterial colony forming units of a single pathogen per milliliter of uncentrifuged, clean voided, mid-stream urine. The impact of ASB on pregnancy outcome has been a focus of controversy. The aim of this study was to detect the prevalence of ASBU in pregnant women in Sulaimani city, its causative bacteria, and their susceptibility to antibiotics. Bacterial culture and antibiotic sensitivity testing were performed on urine samples from 112 pregnant women who were visiting Maternity Teaching Hospital for routine antenatal care. All women were not having symptoms of urinary tract infections. The prevalence of ASB among 112 pregnant women in the current study was 42.9% and *Escherichia coli* was the commonest bacteria isolated (35.4%). The antibiotic sensitivity results revealed that meropenem and azithromycin were the most effective against bacterial isolates. There were no significant differences in demographic data between pregnant women with and without ASB. Asymptomatic bacteriuria is a common condition among pregnant women in Sulaimani city and *Escherichia coli* is the commonest causative agent. meropenem and azithromycin are the most sensitive antibiotics against the causative agents.

KEYWORDS: Asymptomatic bacteriuria, Pregnancy, Sulaimani city.

INTRODUCTION

The traditional definition of asymptomatic bacteriuria (ASB) is the presence of 100,000 bacterial colony forming units of a single pathogen per milliliter of uncentrifuged, clean voided, mid-stream urine; or one catheterization specimen from an individual without symptoms of urinary tract infection^[1]. The anatomical and physiological changes in female urinary tract will increase the possibility of ASB^[2]. The impact of ASB on pregnancy outcome has been a focus of controversy; and the development of quantitative urine culture technique in the mid 1950s allowed clear differentiation of women with bacteriuria from those without^[3]. Many studies showed that prevalence of ASB during pregnancy is between 4-7%, however, the prevalence of ASB will be increase if pregnant women have diabetes mellitus, recurrent urinary tract infections, old age, recurrent parity, and anatomical abnormality in urinary system^[4]. The ASB might lead to pyelonephritis of pregnant female, abortion, prematurity, or low – birth weight^[5]. Most of ASB cure spontaneously without need for treatment, but antibiotics might be prescribed in specific groups like pregnancy and patients undergoing specific urological procedures, however, many studies have shown that physician's lack of knowledge, age of patients, and misuse or overdose of antibiotics might aggravate the condition^[6]. In Kurdistan Region of Iraq (KRI), the detection of ASB is not part of usual screening tests during pregnancy, and little is known about the prevalence of ASBU among pregnant women in Sulaimani City/ Kurdistan Region of Iraq. The aim of this study was to detect the prevalence of ASBU in pregnant

women, its causative bacteria, and their susceptibility to antibiotics.

METHODS

Study Population, Setting, and duration

Pregnant women who were visiting Maternity Teaching Hospital for routine antenatal care were asked for study participation, and those who agreed to enter in the study were subjected to clinical evaluation to exclude those with symptomatic urinary tract infection (UTI). The sample collection and laboratory procedures extended from February 2012 till September 2012.

Study design

Cross – sectional study.

MATERIALS & METHOD

A questionnaire was designed for collecting demographic and clinical data from the study group. Nearly 10 milliliter midstream urine sample was collected aseptically in labeled bottle from each woman and was taken to laboratory for processing. In the laboratory, urine sample was subjected to general urine examination, gram stain, quantitative urine culture technique using MacConkey agar and blood agar plates, biochemical tests for bacterial identification, and antibacterial sensitivity testing of bacterial growth by disc diffusion technique (in case of positive bacterial growth) was performed. The presence of 10⁵ or more of bacteria colonies per milliliter of urine was considered an inclusion criteria and woman was regarded as having asymptomatic bacteriuria.

Ethical consideration

A signed consent was obtained from each participant and approval from scientific committee of Technical College of Health was taken for doing this study.

Analysis of the study

The results will be analyzed using SPSS program version 22 with 96% confidence interval level; tests of significance were done with chi-square method and *P*-value below or equal to 0.05 was considered statistically significant.

RESULTS

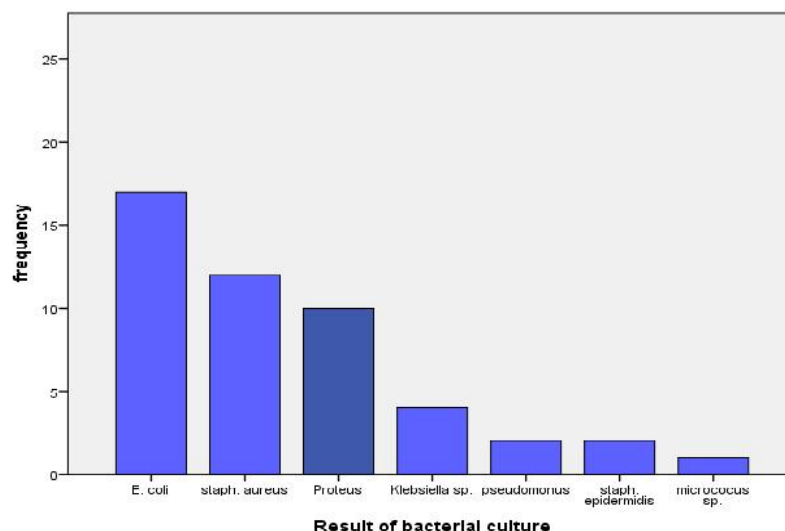
A total 112 pregnant women were recruited to participate in the study, the mean age and standard deviation of participants was 29.8 ± 6.5 yr., and for ASB was 29.6 ± 6.9 . Majority of the study group (76%) were from urban area and 24% were from rural. The participants had various educational backgrounds as showed in table 1.

TABLE 1: Sociodemographic characteristics of the participants

Variable	Category	Total n=112	ASB n=48	Normal N=64
Age	Mean \pm standard deviation	29.8 ± 6.5	29.6 ± 6.9	30.0 ± 6.3
	Percentage	(%)	(%)	(%)
Address	Urban	75.9	81.3	71.9
	Rural	24.1	18.7	28.1
	Percentage	(%)	(%)	(%)
	Unable to read and write	8.9	2.0	14.0
Educational level	Able to read and write	8.9	8.3	9.4
	Primary school	21.4	29.2	15.6
	Secondary school	33.0	37.5	29.7
	Higher education	27.7	23.0	31.3
	Percentage	(%)	(%)	(%)
Gestational age	First trimester	13.4	12.5	14.0
	Second trimester	14.3	18.7	11.0
	Third trimester	72.3	68.8	75.0

The prevalence of ASB among 112 pregnant women in the current study was 42.9% (n= 48). The bacterial cultures of all ASB yielded single bacterial isolates. The bacterial species isolated were *Escherichia coli* (35.4%),

staphylococcus aureus (25.0%), *Proteus* species (20.8%), *Klebsiella* species (8.3%), *Pseudomonas aeruginosa* (4.2%), *Staphylococcus epidermidis* (4.2%), and *Micrococcus* species (2.1%), figure (1).

**FIGURE 1:** Prevalence of different pathogens among pregnant women with asymptomatic bacteriuria attending Maternity Teaching Hospital/Sulaimani city

The antibiotic sensitivity testing of bacterial culture showed that 39.5% of cultured bacteria were sensitive to MEM (Meropenem) followed by 33.3% for AZM (Azithromycin), while the sensitivity to AMP (Ampicillin), NITRO (Nitrofurantoin) and TMP

(Trimethoprim) was in moderate rate, while AMC (Amoxicillin/clavulanic acid) was the least sensitive antibiotic.

The data did not show any statistical significant influence of age, resident, educational level, and gestational age on

ASB. The presence of significant number pus cells (significant pyuria, pus cells ten or more per high power field) in urine of study population was 46.6%, but when compared to non-ASB pregnant women the results were non-significant.

DISCUSSION

The current study reported ASB prevalence of 42.9% among pregnant women. Our results are higher than those recorded in Iran (29.1%)^[10], Ethiopia (18.8%)^[11], India (7.3%)^[12], and in Turkey (8.5%)^[13]. The prevalence of our study is lower than that in Benin city/Nigeria (55%)^[14]. There was no significant difference in mean age of ASB and Non-ASB pregnant women. The mean age of women with ASB was 29.6 ± 6.9 yr and 81.3% were living in urban area. Jain *et al.*^[7] conducted a similar study and found lower mean age but nearly similar percentage of those belong to urban area. The increase in ASB in ages around 30 years might be explained as women in these ages are likely to have had many pregnancies and it has been noticed that multiparity is a possible risk factor for ASB^[8]. The educational status showed no statistical differences between ASB and non-ASB pregnant women and the majority of them have been educated; this result is in agreement with findings from Ghana^[9]. If we assume that educational status reflects the socio-economic status so ASB among pregnancy might not be related to socioeconomic status. The prevalence of ASB showed no significant statistical difference in regard to the three pregnancy trimesters; similar result was also reported by Imade PE *et al*^[8].

The results revealed that significant pyuria is not a special feature of asymptomatic bacteriuria and this in accordance to results of Turpin *et al.*^[15]. The *E. coli* was the most commonly detected microorganism and this in accordance to other studies^[16-18] and it support the fact that *E. coli* is one of mostly encountered UTI pathogen^[19]. *Staph. aureus* was the second most common bacteria isolated in the current study accounting for 25.0 % of cultures. The high prevalence of *Staph. aureus* is in agreement to findings of Imade *et al* and Ezeome IV *et al* PE^[8, 20]. Nearly fifth of ASB cases were caused by *Proteus* species (20.8%) and that is more than that detected some other studies^[8,11]. *Klebsiella* species (8.3%) and *Pseudomonas aeruginosa* (4.2%) were uncommon causes of ASB which is similar to those reported previously^[8,21]. Low prevalence of *Staphylococcus epidermidis* (4.2%) was detected in this study which is less than those reported by Tadesse E *et al.* and Rahimkhani *et al.*^[10,11]. *Staphylococcus epidermidis* is a normal flora and its presence in ASB might reflect less hygienic measures during pregnancy. The current study detected *Micrococcus* species as a cause of ASB in only one pregnant women (2.1%) while previous similar studies did not report this bacteria as a causative uropathogen^[3, 14]. The present study showed that meropenem and azithromycin were the most effective antibiotics against bacterial isolates, while ampicillin, nitrofurantoin and trimethoprim were of moderate effectiveness. The isolates were resistant to amox-clav. These results indicate the need for culture and sensitivity test for selection the appropriate antibiotic and to start treatment of ASB.

CONCLUSION

Asymptomatic bacteriuria is a common condition among pregnant women in Sulaimani city and *Escherichia coli* is the commonest causative agent. meropenem and azithromycin are the most sensitive antibiotics against the causative agents. During pregnancy, the demographic features of asymptomatic bacteriuria are similar to normal women.

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