

## Original Article

### Asymptomatic Urinary Tract Infection in Pregnant Women

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#### ABSTRACT

**Background and Objectives:** Urinary tract infection is one of the most common bacterial infections in the human population, and more frequent infection during pregnancy. With notice to this point that most of urinary tract infections during pregnancy are asymptomatic, they could lead to serious complications such as prematurity, low-birth weight, hypertension, and higher fetal mortality rates if untreated. This study was aimed to determine the prevalence of asymptomatic bacteriuria, bacterial agents and their antibiotic susceptibility pattern in pregnant women attending Semnan public health centers during 2007-8.

**Patients and Methods:** In this descriptive cross sectional study, pregnant women attending Semnan public health centers during May 2007 and June 2008 were investigated. Clean catch mid stream urine samples were collected and cultured on Eosin Methylene Blue agar and Blood agar by calibrated loop method. Suspected colonies were identified, antibiotic susceptibility test was done.

**Results:** Of 297 samples, 10 (3.3%) were positive for asymptomatic urinary tract infection. The dominant bacterial isolate was *Escherichia coli* (70%). The antibiotic susceptibility was observed to ciprofloxacin, ceftazidime and cefotaxime (80%), the most resistance was amoxicillin- clavulanic acid (90%).

**Conclusion:** Frequency of asymptomatic UTI in pregnant women in this study is significantly lower than similar studies. Antibiotic susceptibility rate to using antibiotics do not show significant differences with most other studies.

**Key words:** Pregnancy, Urinary tract infection, *Escherichia coli*, Antimicrobial Agents

#### Introduction

Urinary tract infections (UTIs) account for approximately 10 percent of office visits by women, and 15 percent of women will have a UTI at some time during their life. In pregnant women, the incidence of UTI can be as high as 8 percent (1).

Pregnant women are at increased risk for UTIs. Beginning in week 6 and peaking during weeks 22

to 24, approximately 90 percent of pregnant women develop urethral dilatation, which will remain until delivery (hydronephrosis of pregnancy). Increased bladder volume and decreased bladder tone, along with decreased urethral tone, contribute to increased urinary stasis and ureterovesical reflux (1).

Women with asymptomatic bacteriuria during pregnancy are more likely to deliver premature or

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low-birth-weight infants and have a 20- to 30-fold increased risk of developing pyelonephritis during pregnancy compared with women without bacteriuria. The presence of a significant quantity of bacteria in a properly collected urine specimen from a person without symptoms or signs of UTI characterizes as asymptomatic bacteriuria. Quantitative criteria for identifying significant bacteriuria in an asymptomatic person are: (1) at least 105 colony-forming units (CFUs) per ml of urine in a voided midstream clean-catch specimen; and (2) at least 100 CFUs per ml of urine from a catheterized specimen. According to the IDSA guideline, the diagnosis of asymptomatic bacteriuria in women is appropriate only if the same species is present in quantities of at least 105 CFUs per ml of urine in at least two consecutive voided specimens (2, 3).

Antibiotic resistance in uropathogens is increasing worldwide. It varies according to geographic locates and is directly proportional to the use and misuse of antibiotics. Understanding the impact of drug resistance is of the critical importance as the changing rate of antibiotic resistance has a large impact on the empirical therapy of UTIs (4).

This study conducted to determine the frequency of asymptomatic bacteriuria, bacterial agents and their antibiotic susceptibility pattern in pregnant women attending Semnan Province, central Iran public health centers during 2007-8.

### Materials and Methods

In this descriptive cross sectional study, which was followed according to Helsinki Declaration on Ethical Principals for medical research involving human subjects, pregnant women attending Semnan public health centers during May 2007 and June 2008 were enrolled. Clean catch mid stream urine sample

was collected from pregnant women who do not have any signs or symptoms of UTI (e.g. fever, dysuria, frequency, urgency, or suprapubic pain). Samples were cultured on Blood agar and Eosin Methylene Blue (EMB) agar (Merck Ltd, Darmstadt, Germany) plates by calibrated loop method and incubated in 37°C for 24 h; bacteriuria was defined as presence of 10<sup>5</sup> bacteria or more per 1ml of urine. Suspected colonies were identified by API20E system (BioMerieux Ltd, Marcy, France) (5). Antibacterial susceptibility test was performed according to Clinical and Laboratory Standards Institute recommendations (6). The 11 using disks were ampicillin(AM) 10mg, ceftazidime (CAZ) 30mg, ciprofloxacin (CIP) 5mg, chloramphenicol (C) 30mg, kanamycin (K) 10mg, gentamycin (GM) 10mg, nalidixic acid (NA) 30mcg, tetracycline (TET) 30mg, trimetoprim- sulfamethoxazole(SXT) 1.25/23.75 mg, amoxicillin- clavulanic acid (AMC) 20/10 mg, cefotaxime (CTX) 30mg (Mast Group Ltd., Merseyside, UK). *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 25923(Mast Group Ltd., Merseyside, UK) were used as quality control.

### Results

Out of 297 pregnant women, with age average of 31.9 yr and 6.4 of SD, examined for asymptomatic bacteriuria, 10 were positive (3.3%). Age distribution among pregnant women showing asymptomatic bacteriuria is shown in Table 1. Bacterial isolates were as follow: *E. coli* 7 (70%), *Klebsiella spp* 2 (20%), *Enterobacter spp.* 1 (10%). Antibiotic susceptibility of isolated bacteria was as follows: ceftazidime, ciprofloxacin and cefotaxime (80%), gentamycin and chloramphenicol (70%), nalidixic acid and kanamycin (50%), trimetoprim- sulfamethoxazole (40%), tetracycline (30%), ampicillin and amoxicillin-clavulanic acid (10%).

**Table 1:** Age distribution among pregnant women showing asymptomatic bacteriuria

Age group (yr)	Number of specimen (%)	Number of positive (%)
<20	13(4.4)	0
20 -25	38(12.8)	1(10)
25 - 30	59(19.9)	2(20)
30 - 35	86(28.9)	3(30)
35 - 40	69(23.2)	3(30)
40 - 45	27(9.1)	1(10)
45 - 50	5(1.7)	0
Total	297(100)	10(100)

## Discussion

The prevalence of asymptomatic UTI in pregnant women attending Semnan public health centers was 3.3% (CI: 5.3%, 1.3%).

Turpin *et al.* (7) reported that frequency of asymptomatic UTI was 7.3% in pregnant women. Hernandez *et al.* (8) conducted a similar study in Family Medicine Units of the Instituto Mexicano del Seguro Social and reported that frequency of asymptomatic UTI was 8.4%. Tadesse *et al.* (9) reported that prevalence of asymptomatic bacteriuria in pregnant women was 9.8%. In Iran the frequency of asymptomatic bacteriuria in pregnant women in the medical centers of Tabriz, was 6.1% (10), the frequency of asymptomatic UTI in pregnant women was reported as 3.7% in Gorgan (11), 5.4% in Kashan (12), 10.5% in Tabriz (13) and 10.8% in Tehran (14). Our results do not show significant difference with conducted study in Gorgan but significantly less than other mentioned studies.

Results of this study showed that *E. coli* was dominant bacterial agents of asymptomatic UTI in pregnant women, which was similar to other studies (1, 2, 7, 8, 10-14).

In our study 80% (CI: 100%, 55.2%) of isolates were susceptible to ciprofloxacin, this result is similar with results of Kiffer *et al.*, (15) and Kader *et al.*, (16) studies and significantly higher than study conducted by Akram *et al.*, (17). Susceptibility to ceftazidime was seen in 80% (CI: 100%, 55.2%) of isolates, which was significantly higher than report of Akram *et al.* (17). Susceptibility to getamycin was seen in 70 % (CI: 98.4%, 41.6%) of isolates, which was significantly higher than Akram *et al.* study (17). Susceptibility to trimetoprim- sulfamethoxazole and tetracycline were 40 % (CI: 70.3%, 9.7%) and 30 % (CI: 58.4%, 1.6) respectively, which do not show significant differences with another study (17). Susceptibility of isolated bacteria in this study does not show significant differences with previous studies in Iran (11-14).

## Conclusion

Frequency of asymptomatic urinary tract infection in pregnant women attending Semnan public health centers is less than reported by similar studies; it seems that it would be due to good level of personal hygiene in pregnant women. Although antibiotic susceptibility of isolated bacteria in this study does not show significant differences with some other studies it seems that the number of isolates is not

enough for proper decision.

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