Epidemiological Study of Symptomatic and Asymptomatic Bacteriuria Among Pregnant Women Attending Antenatal Clinic in Baquba- Diyala Province

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Abstract

Background: Pregnancy causes many changes in the pregnant women, due to mechanical and hormonal changes which lead to ureteral dilatation and urinary stasis which contribute to the increased risk of developing urinary tract infection.

Subject and methods: A cross sectional study was conducted at Al-Batool Teaching Hospital in antenatal care clinic from March during October 2012 to study the epidemiology of symptomatic and asymptomatic bacteriuria among pregnant women.

Results: out of 200 pregnant women who were included (24%) and (14%) with ≤20 years old age group were asymptomatic and symptomatic respectively, and (56%), (64%) were asymptomatic and symptomatic in age group 21-30 years old , while in those ≥ 31 years age group was (20%) and (22%) asymptomatic and symptomatic respectively. The asymptomatic bacteriuria was (77%) and it was higher among 31-40 weeks of gestation than other weeks of gestations (p= 0.006).

The nulliparous was (27%) asymptomatic and (21%) symptomatic, where para1- para3 was (56%) asymptomatic and (65%) symptomatic and para4 and above was (17%) asymptomatic and (14%) symptomatic. *Escherichia coli* was (42.3%) more than other species.

Conclusion: Urinary tract infections is a public health problem, Routine urine culture test should be performed on all antenatal asymptomatic and symptomatic pregnant women to identify unsuspected infection.

Key words: Urinary tract infections, bacteriuria, urine culture.

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Introduction

Urinary tract infection (UTI) refers to both microbial colonization of the urine and tissue invasion of any structure of the urinary tract. Bacteria are most commonly responsible although yeast and viruses may also be involved, asymptomatic bacteriuria, in which urine culture reveals a significant growth of pathogens, that is greater than 10^5 bacteria/ml, but without the patient showing symptoms of UTI(dysuria, frequency, urgency, suprapubic pain, abdominal pain, loin pain, etc…) it can be found in both pregnant and non pregnant women [1].

Several anatomical and hormonal changes in pregnant lead to ureteral dilatation and urinary stasis that enhances

the progression from asymptomatic to symptomatic bacteriuria (perhaps if untreated) which could lead to adverse obstetric outcomes such as poor maternal and perinatal outcomes e.g. intrauterine growth restriction, preeclampsia, caesarean delivery and preterm deliveries [2,3,4].

Furthermore, it has been observed that asymptomatic bacteriuria can lead to cystitis and pyelonephritis which can lead to acute respiratory distress, transient renal failure, sepsis and shock during pregnancy, screening of pregnant women for UTI can minimize these UTI associated complications [4].

Symptomatic UTI occurs in 1% to 2% of pregnancies, while asymptomatic bacteriuria has been reported in 2% to 13% of pregnant women [2].

UTI can chronically recur, 20 percent of women who have one infection will have a recurrence. Of this group, 30 percent will have a third occurrence, and of this group, 80 percent have additional recurrences [3].

Thus proper screening and treatment of bacteruria is necessary to prevent complications during pregnancy [5,6]. There are several ways to diagnose UTI, but urine culture still remains the most reliable tool for its diagnosis. Urine culture has shown *Escherichia coli* to be the most common bacterial isolate of UTI during pregnancy, other studies have also reported *Klebsiella spp* and *Staphylococcus aureus* as the commonest isolate [7].

Subjects and Methods

The study was conducted in Al-Batool Teaching Hospital from 1st March during October 2012 as cross- sectional study including 200 pregnant women selected randomly from outpatient clinic and were categorized into two groups as symptomatic and asymptomatic each group include 100 pregnant. Questionnaire including age, parity, weeks of gestations, no antibiotic 3 days prior to collection of samples, clinical symptoms(dysuria, frequency, urgency and suprapubic or loin pain and foul odor of urine) at the time of collection of urine specimen, 10- 15 ml of freshly voided midstream urine specimen was collected in a wide- mouthed sterile container from all patients. A quantitative urine culture was obtained with blood and MacConkey agar plate. Significant growth means; the presence of > 100,000 organisms/ml urine of a single bacterium, while heavy mixed growth means; presence of > 100,000 organisms/ml urine of more than one type of bacteria. Variables were presented in numbers, percentages and graphs by using SPSS program(Statistical package of social analysis) version 17, Chi-square test as a test of significant, P value below 0.05 consider as significant.

Results

Table (1) show urinary tract infection among pregnant women including asymptomatic and symptomatic according to their age group, those whose age ≤ 20 years was (24%) in asymptomatic and (14%) in symptomatic, in age group 21-30 years were (56%) and (64%) in asymptomatic and symptomatic pregnant women respectively, while those with age groups of ≥31years was (20%) in asymptomatic and (22%) in symptomatic pregnant women.

Table (1): Distribution of pregnant women and their clinical symptoms according to their age groups in the studied group.

Age(years)	No. Asymptomatic	%	No. Symptomatic	%	Total	P value
20≤	24	24	14	14	38	0.126 [NS]
21-30	56	56	64	64	120	
≥ 31	20	20	22	22	42	
Total	100	100	100	100	200	

X^2= 3.26

Df= 2

P= 0.126 (not significant) NS

As shown in table(2), the bacterial infection among pregnant women according to their weeks of gestations it showed that ≤20 weeks (6%) and (20%) in asymptomatic and symptomatic pregnant women respectively, in 21- 30 weeks of gestations it was (9%) in asymptomatic and (10%) in symptomatic, in gestation of 31-40 weeks (77%) and (56%) in asymptomatic and symptomatic pregnant women respectively, while those whose ≥ 40 weeks (8%) in asymptomatic,(14%) in symptomatic.

Table (2): Distribution of pregnant women and their clinical symptoms according to their weeks of gestation in the studied groups.

Weeks of gestation	No. Asymptomatic	%	No. Symptomatic	%	Total	P value
20≤	6	6	20	20	26	0.006
21-30	9	9	10	10	19	
31- 40	77	77	56	56	133	
≥ 40	8	8	14	14	22	
Total	100	100	100	100	200	

X^2= 12.54

Df= 3

P= 0.006 (significant)

Regarding the distribution of bacterial infection among pregnant women according to their clinical symptoms and parity, it was shown that nulliparous women was (27%) in asymptomatic while (21%) in symptomatic pregnant women. On the other hand it was (56%) and (65%) in asymptomatic and symptomatic pregnant women respectively in Para 1,2,and 3, while in pregnant women whose Para 4 and more it was (17%) in asymptomatic and (14%) in symptomatic pregnant women, table (3).

Table (3): Distribution of pregnant women and clinical symptoms according to their parity in the studied groups.

Parity	No. Asymptomatic	%	No. Symptomatic	%	Total	P value
Nulliparous	27	27	21	21	48	0.425
P1- P3	56	56	65	65	121	
≥ p4	17	17	14	14	31	
Total	100	100	100	100	200	

X^2= 1.71

Df= 2

P-value= 0.425 (not significant) NS

Table (4) shows urinary tract infection among pregnant women and their clinical symptoms according to the presence or absent of bacterial growth in asymptomatic women there was (43%) have bacterial growth while (57%) with no bacterial growth but in symptomatic pregnant women (52%) have bacterial growth and (48%) have no growth.

Table (4): Distribution of pregnant women and clinical symptoms according to presence or absence of bacterial growth

Growth of bacteria	No. Asymptomatic	%	No. Symptomatic	%	Total	P value
No growth	57	57	48	48	105	0.203
Bacterial growth	43	43	52	52	95	
Total	100	100	100	100	200	

X^2= 1.62

Df= 1

P-value= 0.203 (not significant) NS

As shown in table (5), table(6) and figure (1) the types of bacterial species among asymptomatic and symptomatic pregnant women, it was found that *Escherichia coli(E.coli)* (32.5%) in asymptomatic and (42.3%) in symptomatic, in asymptomatic women *Klebsiella pneumonia* (23.2%) and (26.9%) in symptomatic, *Proteus mirabilis* found in (23.2%),(15.3%) in asymptomatic and symptomatic pregnant women respectively, *B- hemolytic streptococcus* was (4.6%) in asymptomatic and (15.3%) in symptomatic, *Staphylococcus epidermdimides* was (15.3%) in symptomatic pregnant women.

Table (5): Species of bacteria among asymptomatic pregnant women in the studied groups.

Types of bacterial growth	No.	Percent (%)
Escherichia coli	14	32.5
Klebsilla pneumonia	10	23.2
Proteus mirabilis	10	23.2
B-hemolytic streptococcus	2	4.6
Staphylococcus epidermidis	7	16.2
Total	43	100

Table (6): Species of bacteria among symptomatic pregnant women in the studied groups

Types of bacterial growth	No.	Percent (%)
Escherichia coli	22	42.3
Klebsilla pneumonia	14	26.9
Proteus mirabilis	8	15.3
B-hemolytic streptococcus	8	15.3
Total	52	100

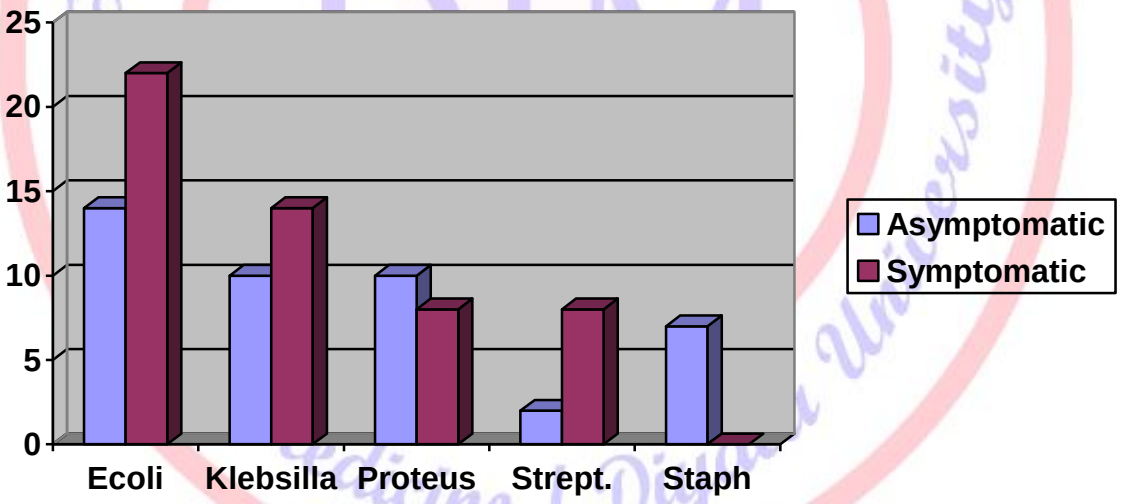

Figure (1): Species of bacteria among asymptomatic and symptomatic bacteruria in the studied group.

Discussion

Urinary tract infections are remarkably common in women. 20% women in the age range 20-65 years suffer from at least one attack per year, 50% develop a urinary tract infection within their life time. Not surprisingly infections of the urinary tract are the most common bacterial infections encountered during pregnancy, whether it is symptomatic or asymptomatic.

Asymptomatic bacteriuria during pregnancy is a common and important medical condition, that result in overt renal infections such as pyelonephritis if not detected and treated [8].

The main finding in the present study was that, 64% of pregnant women had symptomatic urinary tract infections among age group of 21-30 years old, and it was more than asymptomatic (56%) for the same age group, but it was not statistically significant, this result is in agreement with study of Gulfareen, et al.,2010 [9] who found that Maternal age was not found to be a significant risk factor in their study.

Although the rate of asymptomatic urinary tract infection is higher in age group 21-30 years (56%) comparing with those of age group ≤ 20 years and those ≥ 30 years (24%, 21%) respectively. These findings are not in agreement at least in part with Sabahat, et al., 2011 [6] who found higher incidence of asymptomatic bacteruria found in age group of ≥ 30 years (12.43%)s. This probably may be due to early detection of asymptomatic bacteriuria in age group between 21-30 years, because younger pregnant women usually seeking medical advice more than older pregnant women.

The present study observed that higher number of women at 31-40 weeks of gestations had asymptomatic bacteriuria (77%) with p value of 0.006 which was highly significant than the same weeks of gestation in symptomatic group (56%). These results are inconsistent with Obirikorang, et al., 2012 [7] who observed that pregnant women in the second trimester had the highest prevalence of asymptomatic bacteruria followed by pregnant women in the third trimester of pregnancy. Also in this study the higher number of urinary tract infection whether symptomatic or asymptomatic were in 31-34 weeks of gestation comparing with other weeks of gestation in both groups. These results are inconsistent with Hamdan, et al., 2011 [4] who reported that gestational age was not found to be a risk factor for urinary tract infection among pregnant women, however, these results are consistent with Sabahat, et al., 2011 [6] who observed that the third trimester was associated with highest rate of urinary tract infection cases (11.9%) followed by second (7.5%) and first (5.7%) trimester. This may be due to (at least in part) to ignorance of visit the antenatal care clinic throughout pregnancy in our country and other poor countries with lack of education, so the identification of urinary tract infection occur in third trimester when the pregnant starts uterine contraction that due to preterm or term labour, while lower rate infection found in those > 40 weeks both in symptomatic and asymptomatic urinary tract infection (14%) and (8%) respectively. This may be due to decrease in the number of women that reach to such gestational age because early delivery caused by uterine contractions that stimulated by infection which is not discovered and treated early.

With regard to gravidity/parity, the results showed that gravidity had a significant relationship with urine culture results, and primigravida (nulliparous) women had lower rate of bacteriuria than those who had babies both in symptomatic and asymptomatic bacteriuria (p1-p3) (65%) and (56%) respectively, while nulliparous (21%), (27%) respectively, while lower rate found with grandmultiparous > p4 in both symptomatic and asymptomatic bacteriuria (14%), (17%) respectively.

These findings are consistent with Obirikorang, et al., 2012[7] who observed that Multiparous groups (G2 - G5) in their studies had higher bacteriuria than nulliparous/ primigravida, but inconsistent with Sharifa, 2010 [10] about grandmultiparous women, because her study showed higher levels of infection with this group. On the other hand, this study is not agree with Marahatta, et al., 2011 [11] who found higher rate of infection in primigravida, but agree with his results

regarding grandmultigravida who had the lower incidence of infection. On the other hand, although symptomatic urinary tract infection among pregnant women whose p1-p3 (65%) which was higher than asymptomatic bacteriuria with the same parity (56%) however it is statistically insignificant.

In this study, although pyuria was found in all samples from symptomatic and asymptomatic pregnant women, only (52%) of symptomatic women had bacterial growth which was higher than asymptomatic women who had (43%) bacterial growth. These findings were statistically insignificant, but it made us to interpret that bacterial growth can present in culture even if pregnant women had no symptoms.

Regarding different species of bacteria that isolated from urine culture in symptomatic and asymptomatic pregnant women, *Escherichia coli* was the commonest pathogen responsible for bacteruria in symptomatic and asymptomatic bacteruria (42.3%) and (32.%) respectively. These findings are in agreement with several studies that carried out in different parts of the world (1,4,6,7,8,11) which found that *Escherichia coli* is the commonest organism causing urinary tract infection. Other bacteria found were *staphylococcus epidermides, Klebsiella pneumonia, proteus mirabilis*, and other in decreasing order. This also agree with this study, but not as shown by with Nawal, 2011 [12] who found in her study that the most common organism was *streptococcus agalactia* and the other organisms isolated were *E.coli, Enterococcus faecalis, Klebsiella* and *Candida*, these organisms cause urinary tract infection less commonly.

In this study, staphylococcus saprophyticus was isolated only from urine culture of asymptomatic pregnant women (16.2%) but not from symptomatic pregnant, it can be concluded that UTI is a common public health problem in pregnancy, early detection among asymptomatic and symptomatic is important to prevent complications. Also E.coli is the common isolated bacteria, therefore urine culture is recommended for both symptomatic and a symptomatic pregnant women.

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