

Prevalence of Symptomatic Urinary Tract Infections and Asymptomatic Bacteriuria in Iraqi Pregnant Women of Babylon Governorate

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Abstract

Background: Urinary tract infections (UTIs) are the most common infections among pregnant women. It can lead to poor maternal and perinatal outcomes. **Objective:** The objective of the study is to determine the prevalence rate of symptomatic UTIs and asymptomatic bacteriuria of pregnant women in the Babylon Governorate and to determine its association with sociodemographic, obstetrical, and other factors. **Materials and Methods:** Cross-sectional study between March 2018 and June 2018 involves examining 300 pregnant women at primary health centers; Maternity and Pediatrics Hospital of Hilla city, with and without symptoms of UTI were employed for this study. Midstream urine samples were taken, and general urine examination was performed. **Results:** The results of this study revealed that the overall prevalence of UTI among pregnant was 64.6% which include (symptomatic bacteriuria 8.0%, asymptomatic bacteriuria 6.3%, and UTI 50.3%). The higher rate of UTI was found in lower age, multiparous women, and during the second trimester. Factors such as socioeconomic status, history of UTI, dysuria, and positive laboratory results were found to be significantly associated with UTI. **Conclusion:** UTI is still the common health problem in pregnant women especially during their second trimester. Urinalyses are essential for all pregnant women during the antenatal period. The screening will be assisted to early detection and treatment of asymptomatic bacteriuria which prevent complication for mother and baby.

Keywords: Asymptomatic bacteriuria, pregnant women, prevalence, urinary tract infection

INTRODUCTION

The urinary tract infection (UTI) with bacteriuria is significantly increased during pregnancy comparing to nonpregnant women that is mostly benign. Infection of bacteriuria in pregnant woman has increased liability to pyelonephritis.^[1]

Through normal pregnancy, there are several physiological changes; these changes include increasing in the volume of vessel and interstitial of the renal system lead to increase kidney dimension about 1 cm, regarding renal volume increase about 30%. In addition, the upper urinary tract will be dilated, ureter, pelvis, and calyces region by midpregnancy about 80% of women. The dilatation occurs frequently on the right side than on the left.^[2]

Dilatation of the kidney and ureter in pregnancy are called hydronephrosis, hydroureter respectively which occur mostly during the second trimester and persist till delivery. Both

hormonal and mechanical factor can cause this dilatation; increase progesterone hormone level will lead to reduce in bladder and ureteral tone.^[3]

While mechanical factor caused by gravid uterus compression, concurrently with smooth muscle relaxation lead to reduce ureter peristalsis and increase capacity of bladder volume, so resulted in urinary stasis, in addition to that alteration pH of urine and osmolality and glycosuria induced by pregnancy may exaggerate growth of bacteria.^[2] UTI in pregnancy can be divided into asymptomatic and symptomatic types.^[1,4]

Asymptomatic bacteriuria is mostly involved lower part of the urinary tract which is common cause of UTI in pregnant

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women while upper part involvement can cause symptomatic bacteriuria and is considered by acute pyelonephritis.^[5]

UTI is the most common medical problem during pregnancy which account for 20% of pregnancies and 10% of hospitalization in antepartum period.^[6,7] *Escherichia coli* is the most prominent organism that cause UTI in pregnant and nonpregnant women occur in about 80%–90%.^[8]

Infection of group B-streptococcus organism and frequent use of antibiotics in treatment UTI of other organism increase the incidence of preterm delivery.^[9]

There are other factors play a role to increase UTI in pregnancy as short urethra and close vicinity to anus and vagina, also high rate of UTI raise in low socioeconomic individuals.^[10]

Its impact for both unborn baby and mother are sever. There is increased risk for acute pyelonephritis, low weight of neonate baby and preterm delivery and maybe increase hazard of preeclampsia.^[11]

The production of inflammatory mediators (phospholipase A2, arachidonic acid, and prostaglandins) by some bacteria can cause uterine contraction and ripping of cervix, probable mechanism for premature delivery.^[12]

So, as we have seen the risk of pyelonephritis high in pregnancy due to asymptomatic bacteriuria, for that reason in antenatal visits, we need screening for asymptomatic bacteriuria regularly. Consistent with NICE guidelines mid-stream urine culture should be done about 10 weeks of pregnancy whereas screening for asymptomatic bacteriuria recommended by the U. S. Preventive Services Task Force at first antenatal visit or about 12–16 weeks of pregnancy.^[13]

The important consequences of asymptomatic bacteriuria for pregnant women in addition to relatively high incidence of asymptomatic bacteriuria in this group and capability to diagnosis, and treatment. All these explain necessary screening for asymptomatic bacteriuria in antenatal visit.^[14]

This study has been carried out to determined prevalence rate of symptomatic UTI and asymptomatic bacteriuria in pregnancy in Babylon Governorate.

MATERIALS AND METHODS

Study design, setting, and time

This is a cross-sectional study included a convenient sample of 300 pregnant women who visited the primary health centers, and who attended to specialist day clinics or admitted to general wards at Maternity and Pediatrics Hospital, Hilla, Iraq, who agreed to participate in this study over a period of 5 months beginning from March 15 to August 15, 2018.

Sampling technique and data collection

Pregnant women who attended primary health care, general wards and who were brought to outpatient clinics at the mentioned hospital who agreed to participate in this study. At the time of data collection, the participants were asked to give

their verbal consent. Each woman was interviewed for about 10 min (woman who refused to participate were excluded, and the next woman was interviewed). Data were collected by using a predesigned questionnaire by which the women were interviewed. This questionnaire included the following variable: maternal sociodemographic factors, obstetrical history, medical history, patient complaint, and general urine examination.

Statistical analysis

The statistical calculations were performed using Statistical Package for the Social Sciences version 22 (SPSS, IBM Company, Chicago, USA), categorical variables were presented as numbers and percentage, Chi-square test was used to show the association between categorical variable, Fisher's exact test was also used to determine the mean differences between groups, $P \leq 0.05$ was considered as statistically significant.

Ethical aspects

The study protocol was reviewed and granted permission by the Ethical Committee of College of Medicine, Babylon University, Iraq.

RESULTS

Distribution of study groups

Figure 1 shows the distribution of the five groups that participated in the study which were (no bacteriuria, symptomatic bacteriuria, asymptomatic bacteriuria, UTI, and lower urinary tract symptoms). About 25.7% represented pregnant women with no bacteriuria, by far the largest group are pregnant women with UTI which represent 50.3%, the three other groups which included (symptomatic, asymptomatic, and lower urinary tract symptoms) were have a percentage (8%, 6.3%, and 9.7%), respectively. The percentage of UTI groups which represented (symptomatic bacteriuria, asymptomatic bacteriuria, and UTI) was 64.6%.

Distribution of the respondents according to the age

Figure 2 depicts the distribution of pregnant women who participated in the study according to their age. Half of the cases (50.3%) were in the age category (15–25 years) regarding

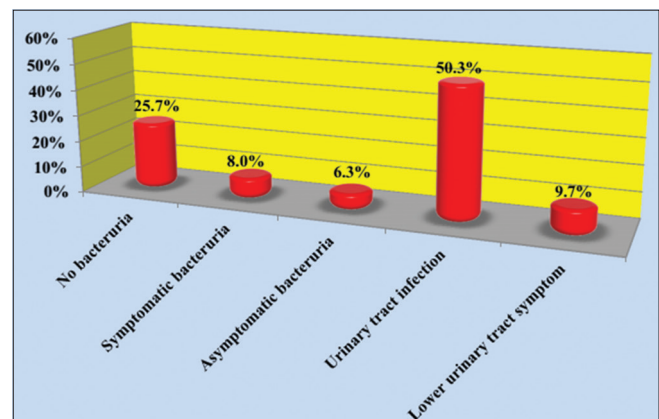


Figure 1: Distribution of study groups

the second category which was (26–35 years) the percentage of pregnant women was 36.7%. The fewer percentages were those of the third category (36–45 years) which represented 13.0%.

Distribution of study groups according to obstetrical variables

Table 1 shows the distribution of study groups according to obstetric variables which were (parity, history of delivery, and gestational period), the ratio of multiparous women with UTI group to nulliparous was three to one (74.2% for multiparous to 25.8% for nulliparous), this is mirrored also in the group of women with no bacteriuria with almost identical percentage. The multiparous women outnumbered nulliparous women in all study groups (75.7%).

Regarding history of delivery (for multiparous women which represented 227 women) 68.3% of all study groups gave a history of birth through normal vaginal delivery, 25.1% had a

history of birth through cesarean section. Regarding gestational period, symptomatic bacteriuria was found in 62.5% of the women in the second trimester, while in UTI group, 53.0% had UTI in the second trimester also, while UTI in the first and third trimester were just about even.

Distribution of study groups according to maternal variables

Table 2 shows the distribution of study groups according to maternal variables which were (age, socioeconomic status, medical history, and types of medical history if present). Half of the respondents aged 15–25 years old accounted for 50.3% of all study groups which were (no bacteriuria, symptomatic bacteriuria, asymptomatic bacteriuria, UTI, and lower urinary tract symptoms). Moreover, in this regard, this age group accounted for 53.7% of all cases of UTI group. Regarding socioeconomic status, the lower socioeconomic status (represented by income which is <300,000 IQD which equate to 250 USD.), the higher the percentage of UTI (56.3%). Regarding medical history, 13.3% of the respondents had positive medical history, from those with positive medical history, 73.8% had a positive history of hypertension.

Distribution of study groups according to maternal urinary tract variables

Table 3 shows the distribution of study groups according to maternal urinary tract variable which were (anatomical abnormality of urinary tract and history of attack of UTI). Those pregnant women with anatomical abnormality of urinary tract represented 2.0% of all respondents. Regarding history of attack of UTI, recurrent attacks represented in 55.0% of all respondents.

Association between symptoms and study groups

Table 4 shows that Chi-square/Fisher's exact test was conducted to show an association between symptoms which

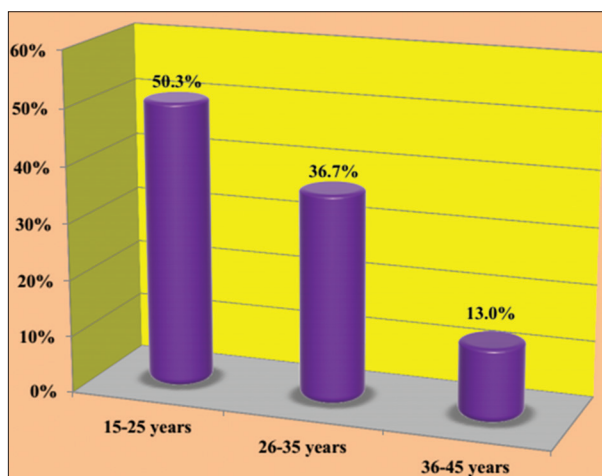


Figure 2: Distribution of the respondents according to the age

Table 1: Distribution of study groups according to obstetrical variables

Variable	Study groups					Total (%)
	No bacteriuria (n=77), n (%)	Symptomatic bacteriuria (n=24), n (%)	Asymptomatic bacteriuria (n=19), n (%)	UTI (n=151), n (%)	Lower urinary tract symptom (n=29), n (%)	
Parity						
Nulliparous	19 (24.7)	5 (20.8)	4 (21.1)	39 (25.8)	6 (20.7)	73 (24.3)
Multiparous	58 (75.3)	19 (79.2)	15 (78.9)	112 (74.2)	23 (79.3)	227 (75.7)
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)	300 (100.0)
History of delivery						
NVD	37 (63.8)	13 (68.4)	9 (60.0)	78 (69.6)	18 (78.3)	155 (68.3)
Cesarean section	19 (32.8)	5 (26.3)	4 (26.7)	25 (22.3)	4 (17.4)	57 (25.1)
Both	2 (3.4)	1 (5.3)	2 (13.3)	9 (8.1)	1 (4.3)	15 (6.6)
Total	58 (100.0)	19 (100.0)	15 (100.0)	112 (100.0)	23 (100.0)	227 (100.0)
Gestational period						
First trimester	26 (33.8)	6 (25.0)	7 (36.8)	36 (23.8)	9 (31.0)	84 (28.0)
Second trimester	28 (36.4)	15 (62.5)	7 (36.8)	80 (53.0)	14 (48.3)	144 (48.0)
Third trimester	23 (29.8)	3 (12.5)	5 (26.4)	35 (23.2)	6 (20.7)	72 (24.0)
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)	300 (100.0)

UTI: Urinary tract infection, NVD: Normal vaginal delivery

Table 2: Distribution of study groups according to maternal variables

Variable	Study groups					Total (%)
	No bacteriuria (n=77), n (%)	Symptomatic bacteriuria (n=24), n (%)	Asymptomatic bacteriuria (n=19), n (%)	UTI (n=151), n (%)	Lower urinary tract symptom (n=29), n (%)	
Age (year)						
15-25	42 (54.5)	9 (37.5)	7 (36.8)	81 (53.7)	12 (41.4)	151 (50.3)
26-35	23 (29.9)	12 (50.0)	9 (47.4)	52 (34.4)	14 (48.3)	110 (36.7)
36-45	12 (15.6)	3 (12.5)	3 (15.8)	18 (11.9)	3 (10.3)	39 (13.0)
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100)	29 (100.0)	300 (100.0)
Socioeconomic status						
<300,000 (ID)	16 (20.8)	12 (50.0)	4 (21.1)	85 (56.3)	6 (20.7)	123 (41.0)
300,000-1,000,000 (ID)	53 (68.8)	10 (41.7)	11 (57.8)	49 (32.5)	20 (69.0)	143 (47.7)
>1,000,000 (ID)	8 (10.4)	2 (8.3)	4 (21.1)	17 (11.2)	3 (10.3)	34 (11.3)
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100)	29 (100.0)	300 (100.0)
Medical history						
Present	7 (9.1)	1 (4.2)	3 (15.8)	25 (16.6)	4 (13.8)	40 (13.3)
Absent	70 (90.9)	23 (95.8)	16 (84.2)	126 (83.4)	25 (86.2)	260 (86.7)
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)	300 (100.0)
Type of medical disease/if present						
Hypertension	5 (71.4)	1 (100.0)	2 (66.7)	19 (73.1)	4 (80.0)	31 (73.8)
Diabetes mellitus	2 (28.6)	0 (0.0)	1 (33.3)	6 (23.1)	0 (0.0)	9 (21.4)
Both	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.8)	1 (20.0)	2 (4.8)
Total	7 (100.0)	1 (100.0)	3 (100.0)	26 (100.0)	5 (100.0)	42 (100.0)

UTI: Urinary tract infection

Table 3: Distribution of study groups according to maternal urinary tract variables

Variable	Study groups					Total (%)
	No bacteriuria (n=77), n (%)	Symptomatic bacteriuria (n=24), n (%)	Asymptomatic bacteriuria (n=19), n (%)	UTI (n=151), n (%)	Lower urinary tract symptom (n=29), n (%)	
Anatomical abnormality of urinary tract						
Present	1 (1.3)	0 (0.0)	0 (0.0)	5 (3.3)	0 (0.0)	6 (2.0)
Absent	76 (98.7)	24 (100.0)	19 (100.0)	146 (96.7)	29 (100.0)	294 (98.0)
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)	300 (100.0)
History of attack of UTI						
No attack	38 (49.3)	2 (8.3)	8 (42.1)	10 (6.6)	4 (13.8)	62 (20.7)
Single	10 (13.0)	9 (37.5)	3 (15.8)	44 (29.2)	7 (24.1)	73 (24.3)
Recurrent	29 (37.7)	13 (54.2)	8 (42.1)	97 (64.2)	18 (62.1)	165 (55.0)
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)	300 (100.0)

UTI: Urinary tract infection

were (pain, fever, chills frequency, dysuria, and nocturia) and study groups which were (symptomatic bacteriuria, UTI, and lower urinary tract symptoms).

There was a significant association between dysuria and study groups ($P = 0.048$).

Association between general urine examination results and study groups

Table 5 shows that Chi-square/Fisher's exact test was conducted to show an association between general urine examination results which were (pus cells, red blood cell [RBC], pH, bacteria, glucose urea, and albumin in urine), and study groups which were (no bacteriuria, symptomatic

bacteriuria, asymptomatic bacteriuria, UTI, and lower urinary tract symptoms).

There was a significant association in between (pus cells, RBC, pH, bacteria, and albumin in urine) and study groups with $P < 0.05$. There is no significant association between glucose urea and study groups, $P = 0.562$.

Association between maternal variables and study groups

Table 6 shows that Chi-square test was conducted to show an association between maternal variables which were (history of attacks of UTI, gestational period and socioeconomic status, parity, history of delivery, medical history, and abnormality of urinary tract) and study groups which were

Table 4: Association between symptoms and study groups

Symptoms	Study groups			χ^2	P
	Symptomatic bacteriuria (n=24), n (%)	UTI (n=151), n (%)	Lower urinary tract symptom (n=29), n (%)		
Pain					
Yes	22 (91.7)	132 (87.4)	26 (89.7)		0.937
No	2 (8.3)	19 (12.6)	3 (10.3)		
Total	24 (100.0)	151 (100.0)	29 (100.0)		
Fever					
Yes	13 (54.2)	82 (54.3)	19 (65.5)	1.273	0.529
No	11 (45.8)	69 (45.7)	10 (34.5)		
Total	24 (100.0)	151 (100.0)	29 (100.0)		
Chills					
Yes	2 (8.3)	22 (14.6)	1 (3.4)		0.219
No	22 (91.7)	129 (85.4)	28 (96.6)		
Total	24 (100.0)	151 (100.0)	29 (100.0)		
Frequency					
Yes	12 (50.0)	72 (47.7)	13 (44.8)	0.145	0.93
No	12 (50.0)	79 (52.3)	16 (55.2)		
Total	24 (100.0)	151 (100.0)	29 (100.0)		
Dysuria					
Yes	12 (50.0)	89 (58.9)	10 (34.5)	6.08	0.048*
No	12 (50.0)	62 (41.1)	19 (65.5)		
Total	24 (100.0)	151 (100.0)	29 (100.0)		
Nocturia					
Yes	5 (20.8)	35 (23.2)	8 (27.6)	0.373	0.83
No	19 (79.2)	116 (76.8)	21 (72.4)		
Total	24 (100.0)	151 (100.0)	29 (100.0)		

* $P \leq 0.05$ was significant, f: Fisher's exact test. UTI: Urinary tract infection

(no bacteriuria, symptomatic bacteriuria, asymptomatic bacteriuria, UTI, and lower urinary tract symptoms). There was a significant association between (history of attacks of UTI and socioeconomic status) with study groups with P value in both circumstances which is <0.001 . There is no significant association between the remaining variables and study groups, in all circumstances, P value was more than 0.05.

DISCUSSION

UTIs are highly frequent seen in primary health center and hospital settings. UTIs are more specific problem for women due to women's anatomy, and up to one-third of all women will have a UTI at some period during their lifetimes.^[15]

Pregnant women are represented immune-compromised UTI hosts due to physiological changes in pregnancy.^[16]

UTI is considered a complicated problem that may lead to pyelonephritis and preterm labor.^[17]

In the present study, the prevalence rate of UTI was 64.6% which include (symptomatic bacteriuria 8.0%, asymptomatic bacteriuria 6.3%, and UTI 50.3%). Which is higher than other studies conducted in Iraq, Mosul (47.4%), and Kirkuk (29%).^[18,19]

This contrast may be due to differences in socioeconomic features and different in study designs and settings. It is nearly

in agreement with study done in AL Muthanna city in Iraq in which the prevalence was 66%,^[20] and 55% in Nigeria.^[21]

Regarding the prevalence of asymptomatic bacteriuria was 6.3% which is in agreement with the Iranian study in which the prevalence rate of asymptomatic bacteriuria was 6.1%,^[22] while slightly lower than prevalence rate of Egyptian study (10%).^[23]

Asymptomatic bacteriuria is one of the biggest risk factors for symptomatic bacteriuria; it is responsible for about 30% of cystitis and 40% of pyelonephritis among unscreened pregnant women.^[16]

Regarding age, the distribution of the respondents revealed that 50.3% with the age of 15–25 years while 36.7% in the age of 26–35 years, and 13.0% in the age of 36–45 years as in Figure 2. The prevalence of symptomatic UTI was found to be higher in the age group of 15–25 years and least in 36–45 years, and this nearly in agreement with other studies.^[3,18,24] This could be due to the fact that women in this age group are sexually active.^[25]

In this study, the ratio of multiparous women with UTI group to nulliparous was three to one (74.2% for multiparous to 25.8% for nulliparous) and this data in agreement to other studies.^[18,26] The multiparous is considered as a risk factor for acquiring asymptomatic bacteriuria in pregnancy.^[27] This fact due to intense physiologic changes affecting the entire urinary

Table 5: Association between general urine examination results and study groups

Variable	Study groups					χ^2	P
	No bacteriuria (n=77), n (%)	Symptomatic bacteriuria (n=24), n (%)	Asymptomatic bacteriuria (n=19), n (%)	UTI (n=151), n (%)	Lower urinary tract symptom (n=29), n (%)		
Pus cell							
≤5	77 (100.0)	23 (95.8)	18 (94.7)	1 (0.7)	29 (100.0)		<0.001* ^f
6-15	0 (0.0)	0 (0.0)	1 (5.3)	72 (47.7)	0 (0.0)		
16-30	0 (0.0)	1 (4.2)	0 (0.0)	55 (36.4)	0 (0.0)		
31-50	0 (0.0)	0 (0.0)	0 (0.0)	13 (8.6)	0 (0.0)		
>50	0 (0.0)	0 (0.0)	0 (0.0)	10 (6.6)	0 (0.0)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
RBC							
≤5	72 (93.5)	22 (91.7)	16 (84.2)	123 (81.5)	20 (69.0)		0.014* ^f
6-100	5 (6.5)	2 (8.3)	3 (15.8)	28 (18.5)	9 (31.0)		
>100	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
pH of urine							
Acidic	69 (89.6)	16 (66.7)	8 (42.1)	111 (73.5)	28 (96.6)	29	<0.001*
Alkaline	8 (10.4)	8 (33.3)	11 (57.9)	40 (26.5)	1 (3.4)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
Bacteria in urine							
Positive	0 (0.0)	21 (87.5)	19 (100.0)	77 (51.0)	0 (0.0)	130.34	<0.001*
Negative	77 (100.0)	3 (12.5)	0 (0.0)	74 (49.0)	29 (100.0)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
Glucose urea							
Positive	2 (2.6)	1 (4.2)	1 (5.3)	12 (7.9)	2 (6.9)		0.562 ^f
Negative	75 (97.4)	23 (95.8)	18 (94.7)	139 (92.1)	27 (93.1)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
Albumin in urine							
Positive	3 (3.9)	4 (16.7)	3 (15.8)	51 (33.8)	2 (6.9)	32.49	<0.001*
Negative	74 (96.1)	20 (83.3)	16 (84.2)	100 (66.2)	27 (93.1)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		

* $P \leq 0.05$ was significant, f. Fisher's exact test. RBC: Red blood cells, UTI: Urinary tract infection

tract in multiparous women has strong impact on the natural history of UTI during pregnancy and these changes are more likely to occur in women who have frequent/pregnancies.^[28]

Regarding history of delivery, the study revealed a higher rate of UTI among women delivered by normal vaginal delivery (symptomatic bacteriuria 68.4%, asymptomatic bacteriuria 60.0%, and UTI 69.6%) and it is in agreement with other study, in which pregnant women with bacteriuria delivered by normal vaginal delivery rather than cesarean section.^[28]

The study revealed symptomatic UTI was found in the second trimester (symptomatic bacteriuria 62.5%, UTI group had 53.0%), this result may be due to physiological changes of pregnancy which peaks at 22–26 weeks and continues to persist until delivery,^[14] while other study^[29] had maximum occurrence in the first and second trimesters. There is other local study in Iraq^[18] revealed that UTI was high in third trimester. Overall from the statistical analysis of the present study that is no significant association between the gestational period with UTI ($P = 0.287$).

There are important risk factors related to bacteriuria, the most important one is a low socioeconomic status. Other factors that have exposed an association with prevalence of bacteriuria in pregnancy include diabetes, recurrent UTI, and anatomical abnormality of the urinary tract.^[1] Hence, in our study, the socioeconomic status (represented by income which is <300,000 IQD which equal to 250 USD), the higher the percentage of UTI 56.3%, symptomatic bacteriuria 50.0%, and this nearly in agreement with other study^[28] in which significant bacteriuria was high in family monthly income less than 500,000 ID. In the present study, there is significant association between socioeconomic status and UTI in which $P < 0.001$. Asymptomatic bacteriuria was found in women with monthly income between (300,000-1,000,000).

The study shows pregnant women with history of UTI had a higher rate of UTI than those without history, recurrent attacks represented in (symptomatic bacteriuria 54.2%, asymptomatic bacteriuria 42.1%, and UTI group 64.2%) and there was a significant association with study group ($P < 0.001$), this results in agreement with other studies.^[30] The reason may be

Table 6: Association between maternal variables and study groups

Variable	Study groups					χ^2	P
	No bacteriuria (n=77), n (%)	Symptomatic bacteriuria (n=24), n (%)	Asymptomatic bacteriuria (n=19), n (%)	UTI (n=151), n (%)	Lower urinary tract symptom (n=29), n (%)		
History of attack of UTI							
No attack	38 (49.3)	2 (8.3)	8 (42.1)	10 (6.6)	4 (13.8)	66.90	<0.001*
Single	10 (13.0)	9 (37.5)	3 (15.8)	44 (29.2)	7 (24.1)		
Recurrent	29 (37.7)	13 (54.2)	8 (42.1)	97 (64.2)	18 (62.1)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
Gestational period							
First trimester	26 (33.8)	6 (25.0)	7 (36.8)	36 (23.8)	9 (31.0)	9.69	0.287
Second trimester	28 (36.4)	15 (62.5)	7 (36.8)	80 (53.0)	14 (48.3)		
Third trimester	23 (29.8)	3 (12.5)	5 (26.4)	35 (23.2)	6 (20.7)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
Socio-economic status							
<300,000	16 (20.8)	12 (50.0)	4 (21.1)	85 (56.3)	6 (20.7)	41.31	<0.001*
300,000-1,000,000	53 (68.8)	10 (41.7)	11 (57.8)	49 (32.5)	20 (69.0)		
>1,000,000	8 (10.4)	2 (8.3)	4 (21.1)	17 (11.2)	3 (10.3)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
Parity							
Nulliparous	19 (24.7)	5 (20.8)	4 (21.1)	39 (25.8)	6 (20.7)	0.668	0.955
Multiparous	58 (75.3)	19 (79.2)	15 (78.9)	112 (74.2)	23 (79.3)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
History of delivery (n=227)							
NVD	37 (63.8)	13 (68.4)	9 (60.0)	78 (69.6)	18 (78.3)	0.691 ^F	
Cesarean section	19 (32.8)	5 (26.3)	4 (26.7)	25 (22.3)	4 (17.4)		
Both	2 (3.4)	1 (5.3)	2 (13.3)	9 (8.1)	1 (4.3)		
Total	58 (100.0)	19 (100.0)	15 (100.0)	112 (100.0)	23 (100.0)		
Medical history							
Present	7 (9.1)	1 (4.2)	3 (15.8)	25 (16.6)	4 (13.8)	0.361 ^F	
Absent	70 (90.9)	23 (95.8)	16 (84.2)	126 (83.4)	25 (86.2)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		
Anatomical abnormality of urinary tract							
Present	1 (1.3)	0 (0.0)	0 (0.0)	5 (3.3)	0 (0.0)	0.887 ^F	
Absent	76 (98.7)	24 (100.0)	19 (100.0)	146 (96.7)	29 (100.0)		
Total	77 (100.0)	24 (100.0)	19 (100.0)	151 (100.0)	29 (100.0)		

* $P \leq 0.05$ was significant, F: Fisher's exact test. UTI: Urinary tract infection, NVD: Normal vaginal delivery

due to the existence of resistant strains of pathogens among those who had a history of UTI.^[16]

Regarding medical history, 13.3% of the respondents had medical history, from those with positive medical history, 73.8% had a positive history of hypertension, and 19 cases of hypertension history had UTI, while only 6 cases of diabetes history had UTI. In the present study, there was no significant association between medical history and UTI ($P = 0.361$).

The current study shows that the higher rate of UTI presented in women who had pain (symptomatic bacteriuria 91.7%, UTI 87.4%), fever (symptomatic bacteriuria 54.2%, UTI 54.3%) and dysuria (symptomatic bacteriuria 50.0%, UTI 58.9%) symptoms as in Table 4. This nearly in an agreement with other studies.^[28] There was a significant association between dysuria and UTI ($P = 0.048$).

The results of indices urinalysis (Pus cell, RBC, ph of urine, bacteria in urine, and albumin in urine) highly significant in association with UTI ($P < 0.05$), except glucose urea which revealed there is no significant association ($P = 0.562$). This result nearly in an agreement with other studies.^[28,31]

Bacteriuria is classified into symptomatic type (UTI) and asymptomatic bacteriuria.^[32] Asymptomatic bacteriuria in general does not need treatment, except for pregnant women.^[33] Due to high risk of bacteriuria during pregnancy that may lead to low birth weight, preterm labor, and infection in the newborn.^[34]

CONCLUSION

This study concludes that the distribution of UTI in pregnant women in the Babylon Governorate is high and needs additional antenatal care. Socioeconomic status, the previous

history of UTI and positive laboratory results are significantly related to the disease while other variables taking by the study such as parity, mode of delivery, gestational period, age, and medical history show positive but not significant differences.

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Conflicts of interest

There are no conflicts of interest.

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