

Isolating and Diagnosing the Bacteria that cause Recurrent Miscarriage and Evaluating some Risk factors in women with Urinary Tract Infections

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ABSTRACT

The current study aimed to isolate and diagnose the bacteria that cause urinary tract infections in pregnant women and cause miscarriage, study the risk factors that help increase infection rates, that included 100 sample , and the percentages of distribution of women's samples were 50 samples from pregnant women, of which 29 were pregnant women. Not infected with a urinary tract infection (Negative UTI), as well as 21 of the pregnancies infected with a urinary tract infection (Positive UTI). The study sample also included 50 miscarried women, a sample in which the percentage of infection (UTI) was distributed as 17 of miscarriage cases without infection (Negative UTI), and 33 miscarriage cases with urinary tract infection (Positive UTI). The study found that the rate of *E.coli* bacteria in pregnant women with UTI (+ev UTI) was 16.66%, the rate of *S. aureus* bacteria in aborted women was 18.51%, and the highest bacterial percentage in the age group (under 29 years) was 62.99% of *E.coli* bacteria (31.48. %), then *S. aureus* bacteria (24.07%). Also, urban women are more susceptible to infection with bacteria, at a rate of 64.81%, compared to women in rural areas, at a rate of 35.19%. The most common isolated species causing urinary tract infections in the city are *E.coli* and then *S. aureus*, and there is no difference between the symptoms, with a positive rate of (53.7). (%), and the disappearance of symptoms (Negative) was (46.3)% of the group of pregnant women and aborted women, The highest species in the first trimester of pregnancy amounted to 66.66%, which was represented by *S. aureus* bacteria, followed by *E.coli*, compared to the second and third trimester, 24.24% *E.coli*, followed by *S. aureus* bacteria, and that the rate of miscarriage was 3 times or more, the percentage was 27.27% *S. aureus* followed by *E.coli*, respectively.

KEYWORDS: Bacteria , Recurrent Miscarriage, Risk Factors , Women, UTI

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INTRODUCTION

Urinary tract infections (UTIs) are among the world's leading infectious diseases and a serious public health problem and are caused by a range of pathogens, but most commonly by *Escherichia Klebsiella pneumoniae*, *Proteus mirabilis*, *Enterococcus coli*, *faecalis* and *Staphylococcus saprophyticus* [1], (UTIs) is one of the most common types of bacterial infections in the United States alone. In recent years, there have been visits estimated at 10.5 million recorded cases of urinary tract infections (constituting about 0.9% of all first aid visits) and emergency department visits, 2-4 million currently. Its risk includes recurrent infections that lead to inflammation of the bladder and kidneys, causing septicemia, kidney damage in young children, premature birth, and miscarriage [2]. Since women suffer from urinary

tract infections more than males, cystitis is diagnosed in the first months of newly married women. Therefore, the importance of periodically reviewing the doctor when symptoms of urinary tract infection appear in women before and during pregnancy has emerged to avoid deformities and the possibility of miscarriage [3]. The prevalence of urinary tract infections is particularly high among pregnant women, as it is estimated that 11% of women over the age of 18 suffer from a urinary tract infection annually, and approximately 50% of all women will have at least one urinary tract infection. Urinary tract infection during their lifetime [2]. A urinary tract infection can also be diagnosed as a recurrent urinary tract infection (rUTI) by occurring more than twice as a diagnosed symptomatic urinary tract infection within the 6 months of the first infection or more than 3 times during the

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12 months of the infection. The first [4]. In the absence of clinical symptoms, asymptomatic bacteriuria (ASB), laboratory examination is sometimes relied upon, and when the number of bacteria does not exceed 10^5 CFU/ml, the diagnosis is asymptomatic bacteriuria, and in this case treatment is rarely prescribed [5]. Spontaneous pregnancy loss is considered a very common occurrence, as approximately 15% of all clinically registered pregnancies lead to spontaneous pregnancy loss, many pregnancies fail before they are clinically registered, and 30 Only 1% of all pregnancies result in a normal live birth. Miscarriage can be physically and psychologically stressful for couples, especially when it occurs repeatedly[6]. Recurrent pregnancy loss (RPL), also referred to as recurrent miscarriage or habitual miscarriage, is medically defined as three consecutive pregnancy losses before 20 weeks of the last menstrual period. Based on the incidence of miscarriage and sporadic pregnancy loss, the incidence of it should Recurrent pregnancy loss is approximately 1 miscarriage for every 300 pregnancies [7]. Studies have indicated that recurrent pregnancy loss (RPL) can be considered a serious pregnancy disorder after two or more recurrent miscarriages. Clinical follow-up before 20-24 weeks of pregnancy is A serious indicator that affects about 2.5% of women who go on to become pregnant[8]. [9], Laboratory results also showed that it has a role in causing two or more consecutive miscarriages, especially during pregnancy periods separated by 12 weeks. The flow of maternal blood to the fetus within the intervening spaces of the placenta begins during the first 10 weeks of pregnancy, so the link between clotting and pregnancy loss is strong after more than 10 weeks of pregnancy due to the lack of need for preparation [10]. The presence and severity of symptoms and the infectious process in a urinary tract infection (UTI) can have an impact on the incidence of miscarriage in women. A UTI is a common bacterial infection that can lead to serious complications if left untreated, including sepsis, miscarriage, and premature birth [11].

MATERIALS AND METHODS

The study included 100 samples, including 50 samples from pregnant women and 50 samples from miscarried women. The initial diagnosis and culture were made using blood and MacConkey agar to isolate pure colonies from the two groups to determine the incidence of urinary tract infection in them

and to diagnose the bacterial isolates using the Vitek System. Bacterial isolates in women with urinary tract infections, respectively. The study samples were distributed into four groups, 50 samples from pregnant women (G1, G2), and 50 samples from aborted women (G3, G4), as follows:

The first group: (G1)29 sample from pregnant women who did not suffer from urinary tract infection. Group 2: (G2)21 sample from pregnant women with urinary tract infection. The third group, (G3) 17 samples from aborted women who did not suffer from urinary tract infections. Group 4(G4) 33 samples from aborted women with urinary tract infections. Pure cultures were created to conduct biochemical analyses and identify the types of bacteria. In addition, the bacterial species were finally identified using the Vitek-2 bioMerieux method, which was used according to the instructions provided by the manufacturer. This method relied on pure culture. And the biochemical characteristics of the isolates.

RESULTS AND DISCUSSION

This study was conducted on 100 samples from women, 50 samples from pregnant women, 29 of which were pregnancies without a urinary tract infection (Negative UTI), as well as 21 (21%) pregnancies with a urinary tract infection. Urinary tract infection (Positive UTI). The study sample also included 50 miscarried women, with a distribution of infection rates (UTI) of 17 miscarriage cases without infection (Negative UTI), and 33 miscarriage cases with infection. Urinary tract (Positive UTI), indicating the relationship of UTI infection with an increase in miscarriages in women who suffer from positive UTI infection, Figure (1).

Studies indicate that urinary tract infections (UTI) are the most common type of infection, with the lifetime incidence ranging between 50-60% in all adult women [12].

Research has confirmed that urinary tract infections (UTI) are a problem of global concern in many countries, with high rates of miscarriage, preterm birth, and neonatal mortality. Mothers here have found rates of UTI in pregnancy that exceed the rates seen in most countries. Healthcare-associated urinary tract infections (HAUTIs) have advanced healthcare priorities, especially for pregnant women, research into pathogenic causes, early detection of UTI causes, and investigation and improvement of appropriate treatment for the cause of the injury, which reduces the damage resulting from the progression of the disease [13], [14].

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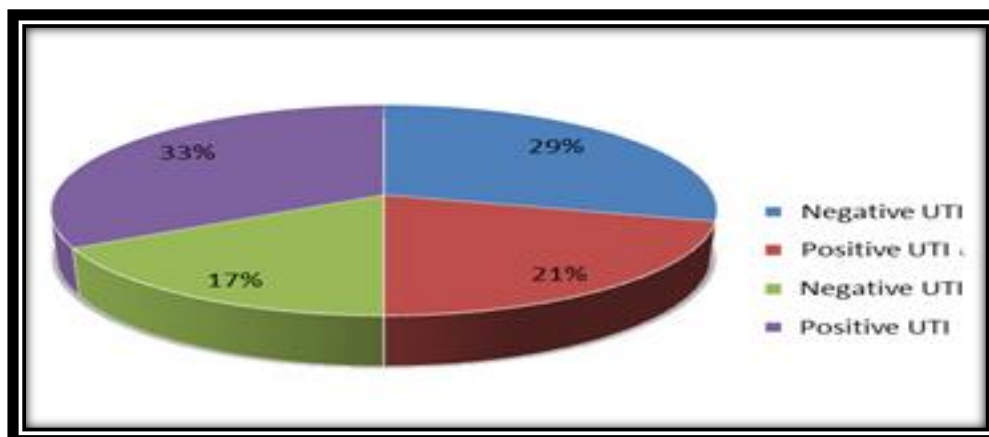


Figure 1: Distribution of proportions of study samples:

The results of the study on the distribution of diagnosed bacterial species (Positive UTI 54) showed 21 samples from pregnant women with urinary tract infection (G2), 33 samples from aborted women with urinary tract infection (4 G), that the highest percentage of bacteria isolated in pregnant women with (UTI^{ev}) *E.coli*, as this percentage reached 16.66%, followed by the percentage of women infected with *K. pneumoniae* isolates at a rate of 7.40%, and then two *S. aureus* bacteria isolates at a rate of 5.55%, equal to the percentage of the other species combined, and finally, the rate of infection with *P. aeruginosa* bacteria was recorded at 3.70%. The isolation of *S. aureus* bacteria reached the highest percentage among aborted women at 18.51%, followed by *E. coli* bacteria at 14.81%, then *P. aeruginosa*, *K. pneumoniae*, and then other species, which amounted to (11.11, 9.25, 7.40)%, respectively. The results of the table indicate that most of the types that cause miscarriage by infecting women with urinary tract infections are caused by the bacteria *S. aureus*, then *E. coli*, and immediately after them *P. aeruginosa* and *K. pneumoniae*, respectively, Table (1).

The bacteria that ranked first in causing urinary tract infections was *E.coli* in pregnant women, and this was indicated by a study [15] which showed that the distribution of coliform bacteria (*E.coli*) was found to be the most common organism causing urinary tract infections (71.4%), followed by *K. pneumoniae* (14.3%) and *S. aureus* (7.1%). A study also showed that undiagnosed and asymptomatic infection was the reason for an increase in the rate of infection with microscopic organisms and led to an increase in the rate

of miscarriage by about 16.7% more than in women who had symptoms of infection. Urinary tract [16], [17], and the results of this study were consistent with the results of the study, which indicated that the main causes that determined the incidence of urinary tract infections in pregnant women were *Escherichia coli* (71.9%) and *Streptococcus*. (14%), followed by *Klebsiella* (8.2%) and *Staphylococcus* spp. (4.9%) On the other hand, the main pathogens causing urine poisoning were *Escherichia coli* (61.2%), *Klebsiella* spp. (19.3%), *Enterococcus* spp. (4.8%), *Serratia* spp. (3.2%), and *Staphylococcus* spp. (3.2%) in women with asymptomatic bacteriuria that progresses to symptomatic urinary tract infection is common in pregnancy, which has negative consequences for the mother and fetus [18]. Fetal complications that can occur due to the absence of symptoms with bacteriuria are a limitation. Intrauterine growth, low birth weight, and premature rupture of the uterine membrane, not to mention the maternal complications associated with asymptomatic bacteriuria such as high blood pressure, preeclampsia, and anemia, and all of these things research has indicated are without treatment due to the Absence of symptoms, this It can lead to complications such as acute cystitis in about 30% of pregnant patients. It is expected that about 50% of patients with acute cystitis during pregnancy will develop acute cystitis, which has adverse effects on pregnancy outcomes for the mother and miscarriage of the fetus. Hence, it becomes very important to identify all ASBs during pregnancy and treat them with appropriate antibiotics [19], [20].

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Table 1: The relationship of urinary tract infection (UTI) to the distribution of bacterial isolates in the group of pregnant women who miscarried (Positive UTI):

Risk factors		Positive UTI 54				P-value	X2 CAL
		21 Pregnant		Abortions33			
		NO	%	NO	%		
Isolation type	<i>E.coli</i>	9	16.66	8	14.81	0.64	3.59
	<i>K. pneumoniae</i>	4	7.40	5	9.25	df=4 / X2 tab= 9.48	
	<i>P. aeruginosa</i>	2	3.70	6	11.11		
	<i>S. aureus</i>	3	5.55	10	18.51		
	Other	3	5.55	4	7.40		
	total	21	38.88	33	61.11		

The results of the current study showed that the highest percentage of isolated bacteria was within the age group (under 29 years) Table(2), which amounted to 62.99%. The highest percentage of infections included *E.coli* bacteria (31.48%), then *S. aureus* bacteria (24.07%). The highest bacterial isolates in the age group under the age of 29 were *E. coli*, then *K. pneumoniae*, then *S. aureus*, and *P. aeruginosa*, out of the total number of bacteria causing urinary tract infections in pregnant women and aborted women, distributed in proportions among the age groups in the table above.

The study also found Table (2) that city women were more likely to be infected with bacteria that cause urinary tract infections, at a rate of 64.81%, compared to women living in rural areas, where they recorded a rate of 35.19%. The most common types isolated causing urinary tract infections in the city were *E.coli* and then *S. aureus*, followed by *K. pneumoniae*, while the bacteria causing urinary tract infections in the countryside were *S. aureus*, followed by *E. coli*, followed by *P. aeruginosa*, respectively.

The table above indicated that the women who had positive symptoms constituted (53.7)% of the group of pregnant women and aborted women, while the table above showed that the women whose symptoms disappeared (Negative) were (46.3), indicating that there was no difference between the samples that Her symptoms disappeared, and tests for bacterial isolates were positive, and among the women who recorded symptoms, the tests for isolates were also positive, as the bacterial type *E.coli* recorded the highest type in terms of infection in both the samples in which symptoms appeared or those in which symptoms did not appear, as for the other types that It was recorded in a sample of infected women with symptoms, while in a sample of women with urinary tract

infection diagnosed by bacterial culture and without symptoms, the species recorded were as follows: *S. aureus*, *P. aeruginosa*, and *K. pneumoniae*, respectively.

A study showed that 58.4% of women with urinary tract infections belong to the age group of 21-30 years, followed by 26% who belong to that age group, and approximately 66.7% of females are married. 33.3% of them were pregnant and more than half of them were in the third trimester of pregnancy. These results can be found in non-employed women 65.9%, rural women 72.4%, and non-degree holders 62.6%. The majority of women with urinary tract infections in this study were, 20.6% of females with urinary tract infections had *Staphylococcus Saprophyticus*, followed by *Saprophyticus* (17.3%) of *Klebsiella Pneumoniae*, 14.4% of *Proteus mirabilis*, and 11.7% of *Escherichia coli*, *Staphylococcus aureus*, and *Staphylococcus epidermidis* [21], [22].

Up to 70% of pregnant women suffer from diabetes mellitus, which promotes the development of bacteria in the urine in addition to increased stasis of urine, ureters, and bladder. Decreased reflux caused by decreased force of the urethra and bladder pressure. Increased bladder volume, which increases the hormones progestins and estrogens in the urine. The ability of the urinary tract to defend against invading bacteria, leads to an increase in [23]. In addition, low socioeconomic status, family history of urinary tract infections, depression, insufficient water intake, low educational levels, catheterization, and anemia. Poor personal hygiene, various contraceptives, and the lack of or limited access to healthcare centers for pregnant women are likely to be the cause of the development of urinary tract infections [24].

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Table 2: The relationship of risk factors to the distribution of causative bacterial isolates (UTI) for the group of pregnant women who miscarried (Positive UTI)

Sample type	Risk factor		the number (%)	type Isolation					. p value. value 0.05	X2 CAL	X2 TAB
	For pregnant women and aborted women 54			E.c	K.p	P.a	S.a	Other			
UTI Positive	Age group	From 29 years And below	34 (62.99)	12	7	4	6	5	0.45	3.63	9.48
		Over 30	20 (37.01)	5	2	4	7	2	df =4		
		Total	54 (100)	17 (31.48)	9 (16.66)	8 (14.81)	13 (24.07)	7 12.96			
	Geographical location	Urban	35 (64.81)	13	7	5	8	2	0.21	5.78	9.48
		Rural	19 (35.19)	4	2	3	5	5	df =4		
		Total	54 (100)	17 (31.48)	9 (16.66)	8 (14.81)	13 (24.07)	7 12.96			
	Presence of symptoms	Positive	29 (53.7)	9	7	5	4	4	0.27	5.13	9.48
		Negative	25 (46.3)	8	2	3	9	3	df =4		
		the total	54 (100)	17 (31.48)	9 (16.66)	8 (14.81)	13 (24.07)	7 12.96			

The results of the current study showed in Table (3) that the highest percentage of bacterial species isolated in the first trimester of pregnancy was 66.66%, of which *S. aureus* represented the highest percentage, followed by *E.coli*, compared to the second and third trimester, 24.24%, and the highest percentage of bacteria isolated in it was *E. coli*, followed by *S. aureus* bacteria. The results in the table above indicated that the number of miscarriages from two or less had the highest percentage of isolated bacterial species (72.72%). The most isolates were of *S. aureus* bacteria, followed by *E. coli* bacteria. As for the incidence of miscarriage, 3 or more times, the rate was 27.27%. The most common occurrence was *S. aureus* bacteria, followed by *E. coli*, *K. pneumoniae*, and then *P. aeruginosa*, respectively. From this it appears that repeated miscarriages are caused by infection with UTI, which is primarily caused by bacteria. *S. aureus* then *E. coli*. [25], [26] indicated that most of the samples collected from pregnant women were in the second trimester of pregnancy

and the results were consistent. However, when samples were taken for women who had miscarriages, the miscarriages were in the first trimester, Table (3), and the highest levels of bacteria were Causing miscarriage in the first trimester, gram-negative bacterial isolates were more prevalent (67.5%) compared to gram-positive bacterial isolates (32.5%). Likewise, the isolation rate of negative and positive bacteria is 60% and 40%, respectively [27]. Most of it is in the rate of aborting twice or less, which is the highest rate of aborting, Table (3). The reason for this may be the presence of a unique structure in Gram-negative bacteria that helps them bond. urinary epithelial cells and prevent bacteria from drifting with flowing urine, allowing penetration and tissue invasion – leading to widespread infection and pyelonephritis in pregnancy [28], [29]. *Escherichia coli* is the most prevalent pathogen with all isolation rates 37.3% and 39.13% of the isolates are (*Staphylococcus* and some other species) [30], [31].

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Table 3: The relationship of the frequency of miscarriage to the distribution of bacterial isolates causing urinary tract infection (UTI) in the group of pregnant women who had miscarriages (Positive UTI):

Sample type	Risk factor For abortions33		the number (%)	Isolation type					p . value. value	X2 CAL	X2 TAB
				Ec	Kp	Pa	Sa	Other			
UTI Positive	Miscarriage period	First third	22 (66.66)	5	1	5	8	3	0.11	13.04	15.50
		and third trimester	11 (24.24)	3	4	1	2	1	4 df =		
		the total	33 (100)	8	5	6	10	4			
	Repeated miscarriage	Twice or less	24 (72.72)	6	3	4	7	4	0.72	2.07	9.48
		Twice or more	9 (27.27)	2	2	2	3	0	4 df =		
		the total	33 (100)	8	5	6	10	4			

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