Risk factors and pregnancy outcomes in Libyan women with urinary tract infection

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Abstract:

Urinary tract infection (UTI) is a common medical problem in pregnancy, it is classified as either asymptomatic or symptomatic, it may be complicated by renal failure, bacteremia and septic shock, as well as preterm birth, and low birth weight. To determine the risk factors of urinary tract infection (UTI) in pregnancy, and to estimate the maternal and fetal complications of urinary tract infections. This was a descriptive cross-sectional study, where 100 Libyan women who delivered at Tripoli medical center, and had history of UTI, during 2010 were interviewed in the post natal ward and inquired about symptom of urinary tract infection during their pregnancy. The study showed that 56% of women aged 26-35 years, 65% were multiparas, risk factors were hyperemesis gravid arum 59%, recurrent UTI during pregnancy 36%, and previous history of UTI 69%, renal stones 5%, renal congenital anomalies 2%, poor water intake where 42% consume < 1 liter, and medical problems including anemia 62%, diabetes mellitus 6%, and hypertension 12%. Maternal complications were miscarriage 14 %, preterm labor 9%, pre labor rupture of membranes 9%, intrauterine growth restriction 2%, and septicemia in 1 %. Neonatal complications include, prematurity 9%, and low birth weight 7%. Screening and optimum treatment by using 7 day regimen for asymptomatic bacteria urea is required to minimize

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both maternal & neonatal complications, further studies are required to establish risk factors and complications in Libya.

Keywords*:* Urinary tract infection, risk factors, maternal complications, neonatal, complications, Libya.

Introduction:

Urinary tract infection (UTI) is a common medical problem in pregnancy. Up to 60% of women will develop UTI at sometime in their lives [1, 2]. It is either asymptomatic or symptomatic. Asymptomatic bacteriuria is defined as true bacteriuria (> 100,000 bacteria/mL) in the absence of specific symptoms, while symptomatic urinary tract infections are divided into lower tract (acute cystitis) or upper tract (pyelonephritis) infections.

Acute cystitis is defined as significant bacteriuria with associated bladder mucosal invasion, symptoms include, dysuria, urgency, frequency, nocturia, hematuria, and, suprapubic discomfort without fever or systemic illnes. Pyelonephritis is defined as the identification of at least 100,000 bacteria / mL of a single uropathogen in a midstream MSSU culture with associated inflammation of the renal parenchyma, calices, and pelvis in the presence of systemic illness, symptoms include flank or renal angle pain, pyrexia, rigors, chills, nausea and vomiting [3].

The prevalence of UTIs during pregnancy ranged between 22 - 45%, and almost 33% of untreated cases of asymptomatic bacterurea may proceed to pyelonephritis, antenatal screening at booking, and 28 weeks is recommended [4]. Risk factors include, low socio-economic status, diabetes mellitus, neurogenic bladder retention, history of previous urinary tract infections, structural abnormalities of urinary tract, the presence of renal stones, and, sickle cell trait [5]. The choice of antibiotic, and the duration of

treatment is guided by national patterns of practice and local resistance patterns, a short course therapy of asymptomatic bacteriuria is accepted. Studies found that the 'no cure rate' for asymptomatic bacteriuria was higher for 1 day treatment than for 7 days treatment [6]. The World Health Organization (WHO) published a study in December 2016, and it concluded that a 7 day antibiotic regimen is recommended to prevent persistent bacteria urea, preterm birth, and low birth weight. The antibiotic chosen should have a good maternal and fetal safety profile, excellent efficacy and low resistance rates in a given population [7]. Several studies have associated UTIs during gestation with the risk of adverse maternal, and perinatal outcomes. including bacteremia and septic shock, hypertension, preeclampsia, and anemia as well as preterm birth and low birth weight Some other studies failed to prove such associations, and it is one of the most important and preventable causes of early preterm birth [8 - 16]. The aim of the study was to determine the risk factors and to estimate the maternal and fetal complications of urinary tract infections.

Patients and methods:

This was a descriptive cross-sectional study , where 100 women who delivered at Tripoli Medical Center, the Obstetrics and Gynecology Department, during one year period, from the 1st of January to the 31st December 2010 and had history of UTI, were interviewed in the post natal ward and inquired about symptoms of urinary tract infection during their pregnancy. The interview was conducted using a structured questionnaires to gather data, including: age, parity, amount of fluid intake, past history of UTI, history of renal disease, history of systemic disease (hypertension and diabetes mellitus), history of complications during pregnancy (like hyperemesis gravid arum and anemia). It also included maternal outcome (miscarriage, preterm labor, intrauterine growth restriction and septicemia) and neonatal outcome (with mother or

admitted to the Neonatal Intensive Care Unit. NICU). It considered if the baby was with mother, that indicate he/she was in a good health otherwise, he/she had complications.

Statistical analysis: Data were entered and coded in the computer using SPSS for windows version18.0 and double checked before analysis. Descriptive statistic were used in the form of percentage, mean, standard deviation, median, mode, minimum and maximum value.

Results:

Table (1) and figure (1) illustrate population criteria of pregnant women who were involved in the study in terms of age, and parity. Table (1) shows that 4% of pregnant women who had UTI were less than 20 years, while 36% of them were between 26 and 30 years, it also shows that 22% of them were between 31- 35 years and 3% of the pregnant women were more than 40 years of age.

Table 1: Distribution of patients according to age

Age group/ Years	Frequency	%
≤ 20	4	4
21 - 25	19	19
26 - 30	36	36
31 - 35	22	22
36 - 40	16	16
> 40	3	3
Total	100	100

Mean = 30.2 years and standard Deviation = 6.7.

Figure (1) sh Tripoli Medical Center and University of Tripoli.
ows that 65% of cases were multi-para while 35% were primi-para

Figure 1: Distribution of patients according to parity

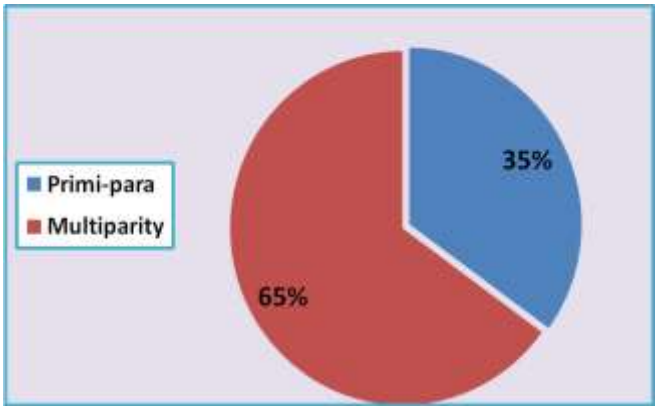

Figure (2) illustrates the recurrence rate of UTI during the pregnancy at the time of the study, and it shows that 36% had recurrent UTI, while 64% had UTI only once during the pregnancy.

Fig. 2: Distribution of patients according to history of recurrence of UTI in this pregnancy

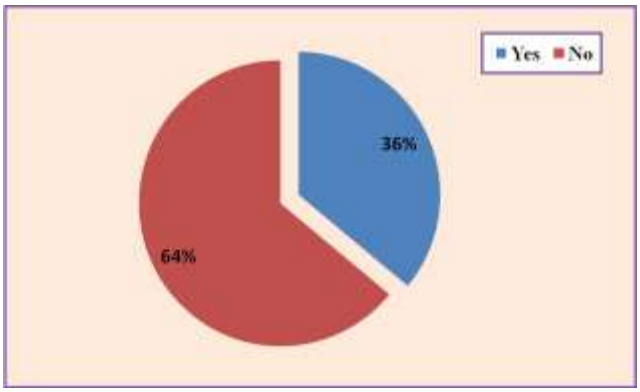

Table (2) illustrates the recurrence rate prior to pregnancy, and it shows that 69% of women had past history of UTI without pregnancy.

Table 2: Distribution of patients according to past history of UTI

Past history of UTI	Frequency	%
Yes	69	69
No	31	31
Total	100	100

Figure (3) shows the frequency of recurrence of UTI in the 69 women who had history of recurrent UTI while not pregnant, it shows that 34.7% of them had recurrent UTI more than three times.

Fig. 3: Distribution of patients according to the frequency of recurrence of UTI

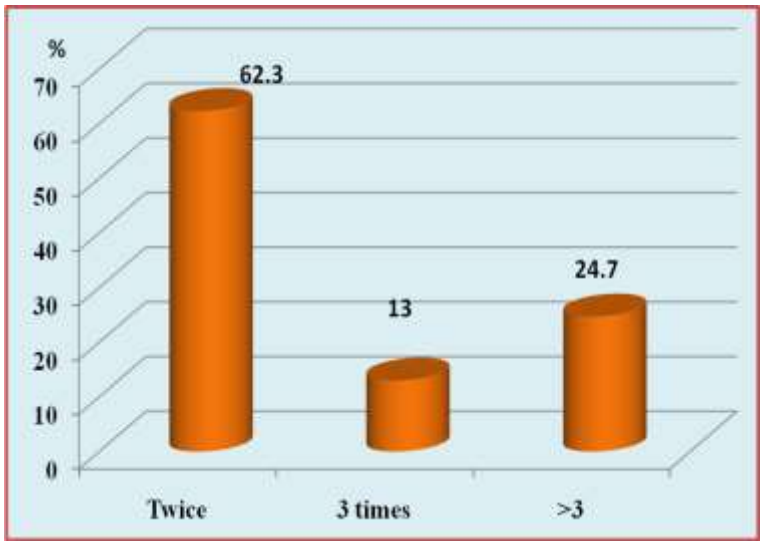

Figure (4) illustrates the relation between water consumption, and UTI, and it shows that 42% of women consume less than one liter of fluid per day, while 25% of them consume more than two liter of fluid per day.

Fig. 4: Distribution of patients according to quantity Of daily fluid intake

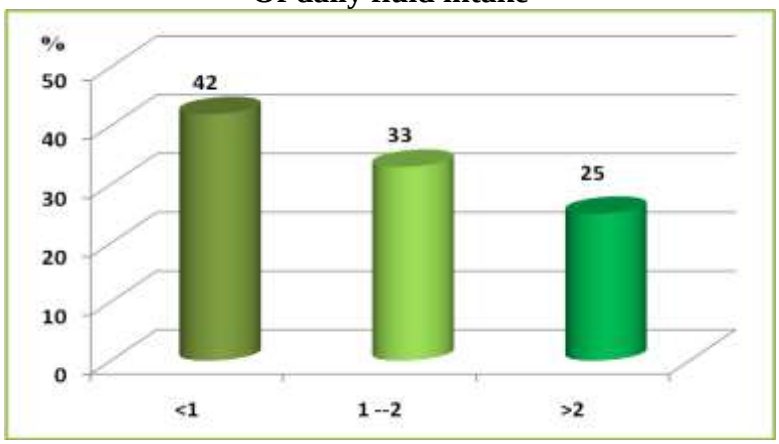

Table (3) shows that 2% of women who had UTI had congenital anomalies in the renal system while 5% of them had renal stones.

Table 3: Distribution of patients according to history of other renal disease

History of other renal disease	Frequency	%
No problem	93	93
Congenital anomaly	2	2
Renal stone	5	5
Total	100	100

Table (4) illustrates medical antenatal problems and their relation to UTI, it shows that, 59% of patients who had UTI were complicated by hyperemesis gravid arum during the first trimester, 62% of women were anemic, 12% had hypertension and 6 % were diabetic.

Table 4: Distribution of patients according to History of medical problems

Medical problems	Frequency	%
No medical problem	19	19
Hyperemesis gravid arum	59	59
Diabetes	6	6
Hypertension	12	12
Anemia	62	62

Table (5) illustrates maternal complications of UTI, it shows that 66% of women who were involved in the study had no complications, 14% had miscarriage, 9% had pre term delivery, and 9% had pre labor rupture of membrane.

Table 5: Distribution of patients according to maternal complications

Maternal complications	Frequency	%
No complications	65	65
Miscarriage	14	14
Pre term delivery	9	9
Prelabour rupture of membrane	9	9
Intra-uterine growth restriction	2	2
Septicemia	1	1
Total	100	100

Table (6) illustrates fetal complications of UTI and it shows that 84% of neonates were healthy, 7% had low birth weight and 9% were premature.

Table 6: Distribution of patients according to neonatal outcome

Babies outcome	Frequency	%
Healthy	84	84
Low birth weight < 2500 gm	7	7
Pre-term < 37 of gestation	9	9
Total	100	100

Discussion:

Urinary tract infection are one of the most common medical complications of pregnancy. Because of the normal physiological changes induced by gestation, pregnant women are especially susceptible to these infections [11]. This study pointed out that the mean ± SD, age of patients was 30.2 ± 6.7 years, the minimum age was 20 years and maximum age was 50 years while a study in Kartoum North Hospital found that the mean age of the patients was 27.5 (±14.6) years [17]. Age between 26 – 35 years constitute to highest percentage (58%) another similar study found that the highest percentage was in women between 26 - 35 years of age (11.5%) [18], while another study conducted in Tanzania did not show a relation between the age and UTI [19]. The mean of parity was (2.3 ± 1.3), primiparas contribute to 35% while multi-paras were 65%. Hamdan et al. found that the mean parity was 2.6 ± (2.4) [17]. The results of this study were similar to the results of a study conducted in Pakistan, which found that 60% of patients were multi-paras and 40% were primiaras [20] while another study found no association of parity with UTI and p value = 0.825 [19]. Low parity (1 - 2) had higher rate of UTI, than others [18], however, other studies found that the multi-parity was a significant risk factor for UTI in pregnancy [21]. Recurrent UTI was recorded in 36% of patients in this study, while Delzeli and Lefever mentioned that UTI recurs in about 5% of pregnancies. This difference may be contributed to the difference in the policy of treating asymptomatic bacteria urea [22].

Past history of UTI was found in 69% of the patients, 62.3% of them had 2 times recurrence, 13% had 3 times recurrence and 24.7% had more than 3 recurrences, a similar study by Zehra et al. found that the past history of UTI was a risk factor for UTI in pregnancy [21]. In Pakistan, a study found that 90% of patients had past history of UTI [20]. Regarding daily fluid consumption, 42% of patient consumed less than one liter, 33% consumed between 1 - 2

liters, while only 25% consumed more than 2 liters. An increase in oral intake of fluids up to three liters per day decreases the incidence of UTI because of the flushing effect on bacteria present in the urinary bladder. Seven patients had history of renal problems, as congenital anomalies (2%) and 5% had history of renal stones, it is known that other problems in the urinary tract system increase the risk of the UTI.

Antenatal problems, including hyperemesis gravid arum in the first trimester which complicated 59% of women involved in the study, diabetes which contributed to 6%, hypertension in 12%, and anemia in 62%, however, anemia is also a complications of UTI. A study conducted in Oman also found that diabetes mellitus increase a woman's risk of UTI [(23)]. Regarding maternal complications of UTI, 14% of women involved in the study had miscarriages, preterm deliveries complicated 9% of the patients, premature rupture of membrane occurred in 9%, and intrauterine growth restriction in 2% of the cases, Ortiz et al. found an association between UTI during pregnancy and preterm deliveries [(24)]. Regarding neonatal outcome, 84% of the neonates were healthy, 16% had different complications (due to other reasons), 7% had low birth weight and 9% were premature. These results are comparable to the results found in other studies which showed that patients with UTI had significantly higher rates of intra-uterine growth restriction (IUGR), pre-eclampsia, caesarean deliveries (CD) and pre-term deliveries (either before 34 weeks or before 37 weeks of gestation) [(25)].

Conclusion:

This study concluded that hyperemesis gravid arum, diabetes mellitus, and anemia are risk factors for UTI, in addition, women who had history of recurrent UTI, either during the pregnancy or prior to it, are at a greater risk. Since UTI is linked to both maternal, and neonatal complications including, miscarriage,

preterm labor, IUGR, and septicemia which may contribute to maternal mortality, however is uncommon, it should be screened for and treated sufficiently in order to prevent these complications.

Recommendations:

Routine screening for all pregnant women for early detection of UTI to decrease the complications, as well as repeated screening for women who have risk factors and 7 day treatment regimens for asymptomatic bacteriuria should be adopted, however further studies are needed to estimate the risk of UTI and obstetric and neonatal complication in Libya.

عدوى المسالك البولية أثناء الحمل في مركز طرابلس الطبي 2010

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المستخلص:

التغييرات الهامة التي تجري في كل من هيكل ووظيفة المسالك البولية أثناء الحمل تؤدي إلى العديد من المشاكل في المسالك البولية أثناء الحمل وقد اجريت هذه الدراسة لتحديد عوامل الأخطار من التهاب المسالك البولية في الحمل ومعرفة المضاعفات للأم وحديني الولادة وقد شملت الدراسة 100 امرأة في مركز طرابلس الطبي، وذلك باستخدام استبيان وقد استنتجت الدراسة ان التهاب المسالك البولية يتكرر عند 69٪ من الحوامل كما ان 9٪ يكون لديهن ولادة مبكرة وبالتالي توصي الدراسة بالكشف المبكر عن التهاب المسالك البولية لتقليل المضاعفات.

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