Urinary Tract Infection among Pregnant Women in Kirkuk City, Iraq

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Abstract

Aim of the study: The objective of this study was to identify the prevalence of urinary tract infection and, its most common causative microorganisms among pregnant women who attended a Primary Health Care centers at Kirkuk city during 2017.

Materials and Methods: A cross-sectional study has been conducted at Kirkuk PHCs during the period of January to July 2017. pregnant women who attended the Antenatal Care Clinic for the first time was approached to participate in the study. Those with known underline renal pathology or chronic renal disease were excluded. After signing an informed consent, relevant medical, obstetrical and socio-demographic characteristics were gathered using information sheet. Maternal weight, height, and body mass index (BMI) was calculated. Data were entered in the computer using SPSS for windows version 19.0 and double checked before analysis.

Results: The prevalence of UTI among pregnant women was (17.0%). Age and parity, were not associated with UTI in this study.

Conclusion: There was high prevalence of UTI among pregnant women in this setting regardless to women’s age, parity and gestational age. E. coli was the most common isolated organism.

Keywords: UTI, urinary tract infection, pregnant.

Introduction

Urinary tract infection (UTI) is a communal health problem among female compared with male due to shorter urethra, closer proximity of the anus with vagina, and pathogen entry facilitated by sexual activity. It is estimated that one in three women of reproduction age treaties UTI, which may noticeable symptoms or remain asymptomatic. Pregnant women are more vulnerable to UTI, due to changed anatomical and physiological state during pregnancy. Asymptomatic bacteriuria (ASB) is an existence of a major quantity of bacteria in a properly collected urine specimen from a person without symptoms or signs of UTI. A prevalence of asymptomatic UTI ranging from 2% to 15% was reported compared to symptomatic UTI in pregnant women. Socioeconomic factors and past history of asymptomatic urinary tract infection were related with UTI in pregnancy. About 30% of women with untreated asymptomatic bacteriuria during pregnancy develop pyelonephritis, which might lead to delivery of
premature or low-birth-weight infants. The objective of this prospective study was to identify the prevalence of Asymptomatic bacteriuria ASB, its most common causative microorganisms and the antibacterial susceptibilities of the isolated microorganisms among pregnant women who attended a Primary Health Care centers at Kirkuk city during 2016.

Methods

A cross-sectional study has been conducted at Kirkuk PHCs during the period of January to July 2017. Serial pregnant women who attended the Antenatal Care Clinic for the first time was approached to participate in the study. Those with known underline renal pathology or chronic renal disease were excluded. After signing an informed consent, relevant medical, obstetrical and socio-demographic characteristics were gathered using pre-tested questionnaires. Every woman was inquired for history suggestive of UTI (urgency, frequency, loin pain etc) and history of using antibiotics in the index pregnancy. Maternal weight, height, and body mass index (BMI) was calculated as weight in kilograms divided by height in meters squared. Data were entered in the computer using SPSS for windows version19.0 and double checked before analysis. Means and proportions of the socio-demographic and obstetrical characteristics were calculated and compared between the growth positive and negative groups using student t and \( \chi^2 \) tests, respectively. Univariate and multivariate analysis were used with isolate positive group as dependent variable and socio-demographic and obstetrics variables as independent variables. Probability values of <0.05 were considered as statistically significant for all results.

Results

Table (1): distribution of study subject according to their demographic and gynecological and obstetrical characteristic:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total No of Women</th>
<th>Women with UTI</th>
<th>Specific prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 y</td>
<td>80</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>20-30 y</td>
<td>106</td>
<td>19</td>
<td>57.6</td>
</tr>
<tr>
<td>31-44 y</td>
<td>114</td>
<td>12</td>
<td>36.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>300</td>
<td>33</td>
<td>11</td>
</tr>
<tr>
<td><strong>Gravity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primigravia</td>
<td>99</td>
<td>5</td>
<td>15.2</td>
</tr>
<tr>
<td>Multigravia</td>
<td>201</td>
<td>28</td>
<td>84.8</td>
</tr>
<tr>
<td><strong>Trimester</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>30</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Second</td>
<td>39</td>
<td>19</td>
<td>57.6</td>
</tr>
<tr>
<td>Third</td>
<td>231</td>
<td>13</td>
<td>39.4</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18.5</td>
<td>62</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>100</td>
<td>16</td>
<td>48.5</td>
</tr>
<tr>
<td>25-29.9</td>
<td>118</td>
<td>12</td>
<td>36.4</td>
</tr>
<tr>
<td>≥30</td>
<td>20</td>
<td>3</td>
<td>9.1</td>
</tr>
</tbody>
</table>
Table (2): logistic regression analysis for independent variables

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Regression</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>68.15</td>
<td>20.22</td>
<td>0.0001</td>
</tr>
<tr>
<td>Gestational age</td>
<td>0.65</td>
<td>26.33</td>
<td>0.0001</td>
</tr>
<tr>
<td>Socio</td>
<td>0.94</td>
<td>11.58</td>
<td>0.0001</td>
</tr>
<tr>
<td>BMI</td>
<td>0.58</td>
<td>10.30</td>
<td>0.0001</td>
</tr>
<tr>
<td>Parity</td>
<td>6.44</td>
<td>9.74</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Discussion

The prevalence of UTI among pregnant women was (17.0%). This results is more than the prevalence of UTI among pregnant women in the others countries for example in Iran\(^7\). Based on the results obtained during 2012-2013, 22600 women have given birth in the hospitals of Dezful city (15200 women in Dr. Ganjavian hospital and 7400 women in Ayatollah Nabavi hospital) and 5% of them (1132 women) were hospitalized due to UTI and they had medical records in both archive department and registration office in the central laboratory of Dr. Ganjavian and Ayatollh Nabavi hospitals. In addition, in studies conducted in different regions of the world, Bookallil et al. study in Australia\(^8\), Turpin study in Ghana\(^9\), Hernandez study in Mexico\(^10\), and Tadesse in North West Ethiopia\(^11\) can be pointed out which results indicated UTI of 4.9%, 7.3%, 8.4%, 9.8% in those areas, respectively. Age, were not associated with UTI in this study. This results is agreement with Tanzania\(^12\) and disagreement with a study carried out by Al-Haddad AM in Yemen\(^13\), the highest rate of infection (53.7%) in pregnant women was in the age range of 15 - 24 years. Additionally, maternal age, have been previously observed as risk factor for UTI among pregnant women\(^14,15,16\).

Likewise in this study gestational age was found as risk factor for UTI among these women. Recently, it has been reported that, UTI developed in third trimester\(^17\). Perhaps the susceptibility of UTI during this period is due to
ureteral dilatation which started as early as 6 week and reaching the maximum during 22-24 weeks (18). In contrast, earlier studies by Hamdan et al on UTI in Sudan (19), Sheikh et al on UTI in Pakistan (20), Masinde et al on UTI in Tanzania (12), Hazhir among asymptomatic pregnant women in Iran (21), Kovavisarach et al on asymptomatic pregnant women in Thailand (22). Multiparity was associated with significant bacteriuria in pregnancy. This had been repeatedly recognized to cause a two-fold increase in the rate of ABU in pregnant women. The association between multiparity and UTI is due to profound physiologic changes affecting the entire urinary tract during pregnancy has a significant impact on the natural history of UTI during gestation. These changes vary from patient to patient and are more likely to occur in women who have pregnancies in rapid succession. According to this study parity was not significantly associated with UTI in pregnancy. This finding is in line with different studies throughout the world such as study by Hamdan et al on UTI in Sudan (19), Masinde et al on UTI in Tanzania (12), Turpin et al among asymptomatic pregnant women in Ghana (9) and Hazhir et al among asymptomatic pregnant women in Iran (21). On the other hand other studies reported the presence of association between multiparity such as studies by Okonko et al on UTI in Nigeria (23), Enayat et al on asymptomatic pregnant women in Iran (24), Haider et al on UTI in Pakistan (14). Other factors like low socio-economic status, sexual activity, washing genitals pre-coitus, post-coitus, not voiding urine post-coitus and washing genitals from back to front have observed as risk factors for UTI during pregnancy (15,25). These factors have not been investigated in the current study; otherwise the results would have been changed.

According to the traditions in Kirkuk city, it might have been difficult to ask about washing genitalia and sexual activity; otherwise patients’ co-operation would be lost. The positive association between high BMI and UTI reported in some previous studies. A cohort study by Semins et al (26), indicated that obesity was a risk factor for UTI. Obese patients were more likely to have an UTI especially in males; furthermore, the obese females were at particularly higher risk for pyelonephritis. In another cohort study on adult patients that include lower UTI only, results showed that the proportion of subjects diagnosed with lower UTI increased with increasing BMI, particularly in males but not in females. Studies on pregnant and postpartum women showed increased risk of UTI in obese women. Escherichia coli was the most common uropathogen isolated (45%). This correlates with findings made by Akoachere et al 2012 (27). It is also consistent with findings in most studies (23,28,29,30).

On the other hand in a study conducted by Amadi et al (31), Staphylococcus aureus was the most prevalent uropathogen. In the same vein, a study carried out by Akoachere et al 2012 (27) found that Klebsiella oxytoca was the most prevalent organism. Variation in geographical location can account for these differences. Klebsiella pneumoniae was the second most prevalent pathogen in this study; a finding which is similar to that reported by recent studies in Sudan and Ethiopia (19,32). As well, many authors have the same findings e.g. in Pakistan (14,33) and India.

**Conclusion**

There was high prevalence of asymptomatic bacteriuria among pregnant women in this setting regardless to women’s age, parity and gestational age. E. coli with its
multi resistance towards antibiotics was the most common isolated organism. Thus urine culture should be performed as screening and diagnostic tool of UTI in pregnancy in this setting.

**Recommendations**

1. Pregnant women should be screened for asymptomatic bacteriuria by urine culture and treated with appropriate antimicrobials.

2. Acute cystitis and pyelonephritis demand full assessment and treatment, with early involvement of other specialists in severe or systemic infection.

   All women should be reviewed to confirm post-treatment urine sterility

**References**


التهاب المسالك البولية لدى النساء الحوامل

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الملخص

هدف الدراسة: تهدف الدراسة إلى التعرف على نسبة انتشار التهاب المسالك البولية وأكثر الأنواع شيوعا من البكتريا المسببة له لدى النساء الحوامل والمراجعات لمراكز الرعاية الصحية الأولية في مدينة كركوك، العراق خلال العام 2017.

المنهجية: تم إجراء دراسة مقطوعة في المراكز الصحية لمدينة كركوك خلال الفترة الممتدة من كانون الثاني و까지 تموز من العام 2017. النساء الحوامل اللائي راجعن المركز الصحي للمرة الأولى تم اختيارهن ضمن عينة الدراسة الحالية. النساء اللائي يعانين من أمراض مزمنة متعلقة بالكلية تم استبعادهن من الدراسة. بعد اخذ الموافقة الخطية والتواقيع على الموافقة على المشاركة في الدراسة تم استخلاص المعلومات الطبية، السكانية، الخصائص الديموغرافية منهن بواسطة استمارة معلومات. تم استعمال برنامج الاحصاء (الحزمة الاحصائية للعلوم الاجتماعية النسخة 19) وتم تدقيق البيانات مرتين قبل إجراء تحليل النتائج.

النتائج: نسبة انتشار التهاب المسالك البولية لدى النساء الحوامل كانت (17%)، تم ارتباط العمر وعدد الولادات مع الإصابة بالالتهاب في هذا الدراسة.

الاستنتاج: كان هناك ارتباط بين التهاب المسالك البولية بين النساء الحوامل في مكان الدراسة، يعتمد على سن المرأة، والعمر الحضري. كان الكائن المسبب المعزول الأكثر شيوعا E.coli.

الكلمات الدالة: التهاب المسالك البولية، الحمل، الجسم.