

Urinary Tract Infection among Pregnant Women in Kirkuk City, Iraq

*Salwa Hazim Al-Mukhtar**

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.

(J Med J 2020; Vol. 54(1):29-35)

Received

Jan 7, 2018

Accepted

Sep. 11, 2019

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^{1,2}. It is estimated that one in three women of reproduction age treaties UTI³, which may noticeable symptoms or remain asymptomatic. Pregnant women are more vulnerable to UTI, due to changed anatomical and physiological state during pregnancy². 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 UTI⁴. A prevalence of asymptomatic UTI ranging from 2% to 15% was reported compared to symptomatic UTI in pregnant women⁵. 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

* Correspondence should be addressed to:
School of Nursing, Mosul University, Iraq
email: Almkhtar_salwahazim@yahoo.com

premature or low-birth-weight infants ⁶. 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 version 19.0 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 χ^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.

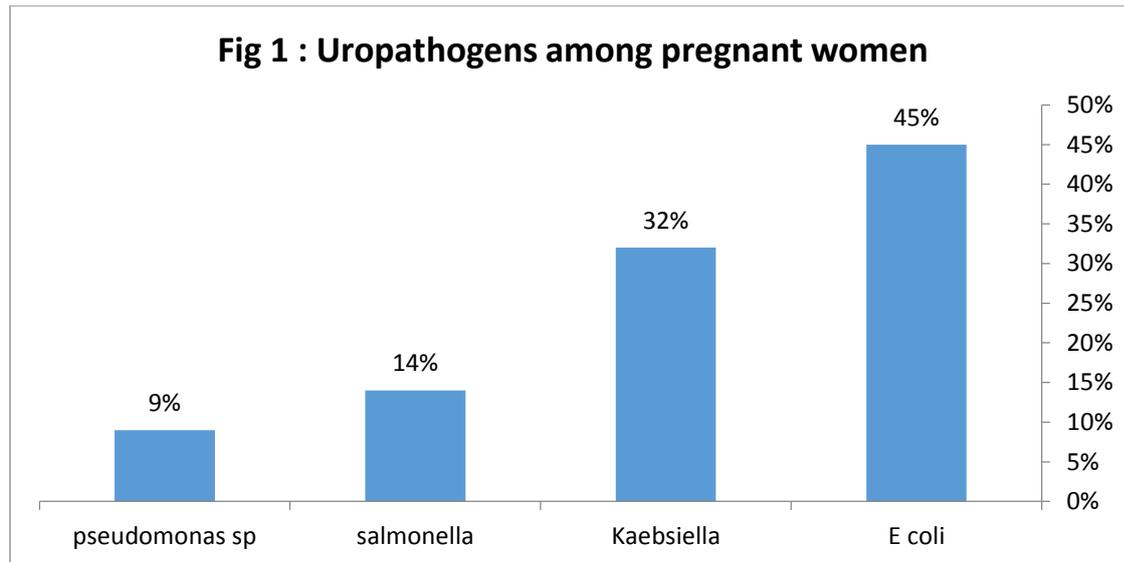
Results

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

Variables	Total No of Women		Women with UTI	Specific prevalence
Age	No	%	No	%
<20 y	80	15	2	6
20-30 y	106	67	19	57.6
31-44 y	114	18	12	36.4
Total	300	100	33	11
Gravity	No	%	No with UTI	Specific prevalence
Primigravida	99	33	5	15.2
Multigravida	201	67	28	84.8
Trimester	No	%	No with UTI	Specific prevalence
First	30	10	1	3
Second	39	13	19	57.6
Third	231	77	13	39.4
BMI	No	%	No with UTI	Specific prevalence
<18.5	62	20.7	2	6
18.5-24.9	100	33.3	16	48.5
25-29.9	118	39.3	12	36.4
≥30	20	6.7	3	9.1

Table (2): logistic regression analysis for independent variables

Independent variables	Regression	t	P
Age	68.15	20.22	0.0001
Gestational age	0.65	26.33	0.0001
Socio	0.94	11.58	0.0001
BMI	0.58	10.30	0.0001
Parity	6.44	9.74	0.0001



Discussion

The prevalence of UTI among pregnant women was (17.0%). This results is more than of the prevalence of UTI among pregnant women in the others countries for example in Iran⁷, 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 precoitus, postcoitus, not voiding urine postcoitus 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

1. IFeitosa D, Silva M, Parada C. Accuracy of simple urine tests for diagnosis of urinary tract infections in low-risk pregnant women. *Revista Latino-Americana de Enfermagem*. 2009;17(4):507-513.
2. Abdullah A., and Al-Moslih M. Prevalence of asymptomatic bacteriuria in pregnant women in Sharjah, United Arab Emirates. *East Mediterr Health J*. (2005); 11:5-6.
3. Duarte G, Marcolin A, Quintana S, Cavalli R. Urinary tract infection in pregnancy. *Rev Bras Ginecol Obstet*. 2008;30:93-100.
4. Schnarr J, Smaill F. Asymptomatic bacteriuria and symptomatic urinary tract infection in pregnancy. *Eur J Clin Invest*. 2008;38(Suppl. 2):50-7.
5. Ipe D, Sundac L, Benjamin W, Moore K, Ulett, G. Asymptomatic bacteriuria: prevalence rates of causal microorganisms, etiology of infection in different patient populations, and recent advances in molecular detection. *FEMS Microbiol Lett*. 2013; 346(1):1-10.
6. Nicolle L. Management of asymptomatic bacteriuria in pregnant women. *Lancet Infect Dis*. 2015;15(11):1252-1254.
7. Amiri N, Rooshan H, Ahmady H, Soliamani J. Hygiene practices and sexual activity associated with urinary tract infection in pregnant women. *East Mediterr Health J*, 2009;15(1):104-10.
8. Bookallil M, Chalmers E, Andrew B. Challenges in preventing pyelonephritis in pregnant women in Indigenous communities. *Rural Remote Health*. 2005;5(3):395.
9. Turpin C, Minkah B, Danso K, Frimpong E. Asymptomatic bacteriuria in pregnant women attending antenatal clinic at komfo anokye teaching hospital, kumasi, ghana. *Ghana Med J*. 2007;41(1):26-9
10. Hernandez Blas F, Lopez Carmona JM, Rodriguez Moctezuma JR, Peralta Pedrero ML, Rodriguez Gutierrez RS, Ortiz Aguirre AR. Asymptomatic bacteriuria frequency in pregnant women and uropathogen in vitro antimicrobial sensitivity. *Ginecol Obstet Mex*. 2007;75(6):325-31.
11. Tadesse A, Negash M, Ketema LS. Asymptomatic bacteriuria in pregnancy: assesment of prevlence, microbial agents and their antimicrobial sensitvty pattern in Gondar Teaching Hospital, north west Ethiopia. *Ethiop Med J*. 2007;45(2):143-9.
12. Masinde A, Gumodoka B, Kilonzo A, Mshana S. Prevalence of urinary tract infection among pregnant women at Bugando Medical Centre, Mwanza, Tanzania. *Tanzania Journal of Health Research*. 2009; 11(3).
13. Al-Haddad A. Urinary tract infection among pregnant women in Al-Mukalla district, Yemen. *East Mediterr Health J*. 2005;11(3):505-10.
14. Haider G, Zehra N, Munir A, Haider A. Risk factors of urinary tract infection in pregnancy. *J Pak Med Assoc*. 2010; 60(3):213-6.

15. Dimetry R, El-Tokhy M, Abdo M, Ebrahim A, Eissa M. Urinary tract infection and adverse outcome of pregnancy. *J Egypt Public Health Assoc.*2007;82(3-4):203-18.
16. Basu J, Jeketera C, Basu, D. Obesity and its outcomes among pregnant South African women. *International Journal of Gynecology & Obstetrics.*2010; 110(2):101-104.
17. Tugrul S, Oral O, Kumru P, Köse D, Alkan A, Yildirim G. (2005). Evaluation and importance of asymptomatic bacteriuria in pregnancy. *Clin Exp Obstet Gynecol.*2005; 32(4):237-40.
18. Dalzell E, Lefevre L. Urinary tract infection of pregnancy. *American Academy of Family Physicians.*2005; 61(3):713-21.
19. Hamdan H, Ziad A, Ali S. Adam I. Epidemiology of urinary tract infections and antibiotics sensitivity among pregnant women at Khartoum North Hospital. *Annals of Clinical Microbiology and Antimicrobials.*2011; 10(1):2.
20. Sheikh M, Khan M, Khatoun A. Incidence of urinary tract infection during pregnancy. *East Mediterr Health J.* 2000; 6: 265-71.
21. Hazhir S. Asymptomatic bacteriuria in pregnant women. *Urol J (Tehran).* 2007; 4: 24-7.
22. Kovavisarach E, Vichaipruck M, Kanjarahareutai S. Risk factors related to asymptomatic bacteriuria in pregnant women. *J Med Assoc Thai.* 2009; 92: 606-10.
23. Okonko O, Ijandipe A, Ilusanya A, Donbraye-Emmanuel B, Ejembi J. Incidence of urinary tract infection among pregnant women in Ibadan, South-Western Nigeria. *Afr. J. Biotechnol.*2009; 8(23): 6649–6657.
24. Enayat, K., Fariba, F. and Bahram, N. Asymptomatic bacteriuria among pregnant women referred to outpatient clinics in Sanandaj, Iran. *Int. braz j urol.*2008; 34(6).
25. Amiri M, Zohreh L, Reza N, Reza N, Masoomeh M, Amin R, Mohammad R, and Hadi Z. Prevalence of Urinary Tract Infection Among Pregnant Women and its Complications in Their Newborns During the Birth in the Hospitals of Dezful City, Iran, 2012 – 2013. *Iran Red Crescent Med J.* 2015 Aug; 17(8): e26946.
26. Semins M, Shore A, Makary M, Weiner J, Matlaga B. The impact of obesity on urinary tract infection risk. *Urology.* 2012;79(2):266–9.
27. Akoachere, J., Yvonne, S., Akum, N. and Seraphine, E. Etiologic profile and antimicrobial susceptibility of community-acquired urinary tract infection in two Cameroonian towns. *BMC Research Notes.*2012; 5(1):219.
28. Imade P, Izekor E, Eghafona O, Enabulele I, Ophori E. Asymptomatic bacteriuria among pregnant women. *North Am J Med Sci* ,2010; 2(6): 263–266.
29. Al Sibiani S. Asymptomatic bacteriuria in pregnant women in Jeddah, Western Region of Saudi Arabia: call for assessment. *JKAU Med Sci* .2010;17(1): 29–42.
30. Çelen, Ş., Oruç, A., Karayağın, R., Saygan, S., Ünlü, S., Polat, B. Danişman, N. Asymptomatic Bacteriuria and Antibacterial Susceptibility Patterns in an Obstetric Population. *ISRN Obstetrics and Gynecology*, 2011;1-4.
31. Amadi ES, E OB, U CJ, N OK, O RA, U OC. Asymptomatic Bacteriuria among Pregnant Women in Abakaliki, Ebonyi State Nigeria. *J Med Sci.* 2007;7(4):698–700.
32. Alemu A, Moges F, Shiferaw Y, Tafess K, Kassu A, Anagaw B, Agegn A. Bacterial profile and drug susceptibility pattern of urinary tract infection in pregnant women at University of Gondar Teaching Hospital, Northwest Ethiopia. *BMC Research Notes.*2012; 5(1):197.
33. Mathai E, Thomas R, Chandy S, Mathai M, Bergstrom S. Antimicrobials for the treatment of urinary tract infection in pregnancy: practices in southern India. *Pharmacoepidemiology and Drug*

التهاب المسالك البولية لدى النساء الحوامل

سلوى حازم المختار

كلية التمريض جامعة الموصل، العراق .

الملخص

هدف الدراسة: تهدف الدراسة إلى التعرف على نسبة انتشار التهاب المسالك البولية و أكثر الأنواع شيوعاً من البكتريا المسببة له لدى النساء الحوامل و المراجعات لمراكز الرعاية الصحية الأولية في مدينة كركوك، العراق خلال العام 2017. المنهجية: نفذت دراسة مقطعية في المراكز الصحية لمدينة كركوك خلال الفترة الممتدة من كانون الثاني و لغاية تموز من العام 2017. النساء الحوامل اللواتي راجعن المركز الصحي للمرة الاولى تم اختيارهن ضمن عينة الدراسة الحالية. النساء اللواتي يعانين من امراض مزمنة متعلقة بالكلية تم استبعادهن من الدراسة. بعد اخذ الموافقة الخطية و التوقيع على الموافقة على المشاركة في الدراسة تم استحصال المعلومات الطبية، النسائية، الخصائص الديموغرافية منهن بواسطة استمارة معلومات. تم احتساب وزن الامهات و الطول و كتلة الجسم و ادخال البيانات الى الحاسوب باستخدام البرنامج الاحصائي (الحزمة الاحصائية للعلوم الاجتماعية النسخة 19 و تم تدقيق البيانات مرتين قبل اجراء تحليل النتائج. النتائج: نسبة انتشار التهاب المسالك البولية لدى النساء الحوامل كانت (17%)، لم يرتبط العمر و عدد الولادات مع الاصابة بالالتهاب في هذا الدراسة.

الاستنتاج: كان هناك انتشار عال من التهاب المسالك البولية بين النساء الحوامل في مكان الدراسة بغض النظر عن سن المرأة، والعمر الحلمي. E-coLi كان الكائن المسبب المعزول الأكثر شيوعاً.

الكلمات الدالة: التهاب المسالك البولية، الحمل، الخمج