Prevalence of Urinary Tract Infection among Secondary School Students in Urban and Rural in Erbil: Comparative Study

انتشار التهاب المسالك البولية بين طلاب المدارس الثانوية في المناطق الحضرية والريفية في أربيل : دراسة مقارنة

Dr. Kareema Ahmad Hussein / Ph.D, Assistant Professor of pediatric nursing, Head of Pediatric Nursing, College of Nursing, Hawler Medical University.
Sadiya Abdulla Palpitany / M.Sc. Microbiology, assistant lecture, College of Nursing, Hawler Medical University.
Suha Hussein Ahmed/ M.S.Microbiology,assistant lecture, College of Nursing, Hawler Medical university.
Email:kareema992000 @ yahoo.com

الخلاصة :

خلفية البحث: التهاب المسالك البولية حالة شائعة لدى الأطفال. تحدث بمعدل 1 لكل 10 من الإناث و 1 لكل 30 من لذكور وغلبا ما تكون الإصابة قبل سن 16 عاما.و في مرحلة متقدمة من المرض تحصل الندب الكلوية مما يؤدي إلى ارتفاع ضغط الدم ، انخفاض وظيفة الكلى وارتفاع نسبة البروتين في الادرار إذا لم يتم تشخصها ومعالجتها مبكر. إن التهاب المسالك البولية عند الأطفال حالة صعبة العلاج في مراكز الرعاية الصحية الأولية لأن الأعراض يمكن أن تكون ضئيلة للغاية في المراحل المبكرة مما تؤثر على العلاج

الهدف : تهدف الدراسة الى تحديد مدى انتشار التهاب المسالك البولية بين طلاب المدارس الثانوية في المناطق الحضرية والريفية في أربيل.

المنهجية:أجريت دراسة وصفية في مدرستين ثانوية حكومية أحداهما في منطقة حضرية والأخرى في منطقة ريفية لمدينة أربيل خلال الفترة من 1 تشرين 2010 وللغاية 30 حزيران 2011 ، تم اختيار عينة عشوائية بلغت 200 طالب وطالبة من هذه المدارس ثم جمعت البيانات من خلال استمارة خاصة أعدت لهذا الغرض وحللت البيانات باستخدام برنامج الإحصائي spss 15 .

النتائج: أوجدت الدراسة أن معدل انتشار التهاب المسالك البولية بين الإناث كانت أعلى وبنسبة (76.1 ٪) في المناطق الحضرية منها في المناطق الريفية (57 ٪)وكانت الإصابة لدى الذكور نسبة (45.3 ٪) أعلى في المناطق الريفية منها في المناطق الحضرية (23.9 ٪) ، في حين وجدت طرق الوقاية المتبعة لدى ن اعداد كبيرة من طلاب مدراس الحضرية لمنع أنفسهم من الإصابة هي غسل اليدين (68.5 ٪) .

الاستنتاجات: تم إيجاد فرق كبير بين طلبة مدارس المناطق الريفية والحضرية في نسبة الإصابة، وكان عامل العمر هو المؤثر الرئيسي لهذا الفرق المعنوي.

التوصيات:أوصت الدراسة بضرورة نشر مبادئ الوقاية لمنع الإصابة بالتهاب المسالك البولية من خلال تثقيف طلاب المدارس والكوادر الصحية العاملة في المؤسسات الصحية.

Abstract

Background: Urinary tract infection (UTI) is a common condition in children. Approximately 1 in 10 girls and 1 in 30 boys will have a UTI by the age of 16 years · Renal scarring as a result of UTI may lead to hypertension, decreased renal function, provsteinuria and end-stage renal disease. This is especially true if the condition is not diagnosed, investigated and managed appropria tely. However, UTI in children is a most challenging condition to treat in primary care because symptoms can be minimal in the early stages

objectives: The aim of the study was to determining the prevalence of UTI's among the secondary schools students in urban and rural areas in Erbil .

Subjects and methods: A descriptive study were carried out at two public secondary schools in Erbil city. During 1st Oct. 2010 to 30th June. 2011. A randomly sample size of 200 students was selected from urban and rural areas in Erbil ,the data was collected by special form and analyzed through the use of statistical package sciences (Spss 15)

Results: The present study found that the prevalence of UTI among female were higher (76.1%) in urban than in rural area (57%) in reversely to UTI among males students which is higher in rural area (45.3%) than males in urban area (23.9%),while roles of prevention in urban and rural area found that the large numbers of students in urban area were preventing themselves by hand washing (68.5%).

Conclusions: Significant difference was found between rural and urban area, age factors were initially to be responsible for the difference in prevalence.

Recommendation: Secondary school's students need for greater education and healthcare providers regarding the prevention of UTI .

Keyworld: Urinary Tract Infection, Secondary School, Student, Urban And Rural Areas

INTRODUCTION:

The normal urinary tract is sterile. A urinary tract infection (UTI) is a microbial infection of the urethra, bladder, ureters or kidney [1]. UTI in children are a significant source of morbidity, particularly when associated with abnormalities [2]. Most infections in boys occur in the first three months of life [3&2] but by school age, the rate has decreased in boys and increased in girls [4]. It's estimated that at least 8% of girl's and 2% boys have UTI in childhood [3, 5]. Urinary tract infections (UTIs) are of the most frequent infectious diseases in children, with a prevalence strongly influenced by gender and age [1].

Knowledge of the prevalence of UTI among different subgroups of children can assist clinicians in selecting children who would benefit from further diagnostic testing. Using prevalence rates as an estimate of the prior probability of disease is the first step in evidence-based practice [6].

The aim of the study was to determining the prevalence of UTIs between the secondary schools students in urban and rural areas in Erbil city and to identify the association between the demographic characteristic with (symptoms, prevention of UTI and urinalysis) of study sample and residence areas.

METHODS AND SUBJECTS:

Descriptive study was carried out at two public secondary schools in urban and rural areas in Erbil. A randomly sample size of 200 students were selected during the period of the 1st /October/ 2010 to 30th / June / 2011. Before data collection, official permissions were obtained from the Ministry of Education and schools. These schools agreed to take part in the study. Within the schools, all students were invited to take part in this study. Among 914 respondents, 200 (74 males and 126 females) of students were participants. A questionnaire was designed that composed of four parts (I, II, III, and IV) to deal with this study.

During collection of urine from students the following exclusion criteria were used: - students who have been on antibiotics for at least three days; students who took large quantities of fluids less than an hour before coming collected the sample and clean voided mid-stream urine samples were collected in sterile universal bottles transported to the laboratory immediately in ice pack bags for urinalysis, detailed history was obtained. The data were gathered by the researchers using direct interview with the students, the data analyzed through the use of statistical package sciences (Spss 15), P-value ≤ 0.01, High significant(HS), ≤ 0.05 significant (S) and > 0.05 non significant (N.S).

RESULTS:

Table (1): Prevalence of urinary tract infection in urban and rural area in relation with socio-demographic data.

Socio-Demographic Data		Residency Area							
		URBAN (n=100)				RURAL (n=100)			
		Urinary Tract Infection				Urinary Tract Infection			
		Positive UTI		Negative UTI		Positive UTI		Negative UTI	
		F.	%	F	%	F.	%	F	%
Student's age (years)	11	10	21.7	18	33.3	3	4.7	5	13.9
	12	20	43.5	16	29.6	13	20.3	3	8.3
	13	13	28.3	12	22.2	11	17.2	18	50.0
	14	3	6.5	8	14.8	37	57.8	10	27.8
Student's gender	Female	35	76.1	36	66.7	35	54.7	20	55.6
	Male	11	23.9	18	33.3	29	45.3	16	44.4
Father's occupation	Governmental Employed	19	41.3	24	44.4	7	10.9	4	11.1
	Private Employed	16	34.8	20	37.0	22	34.4	11	30.6
	Unemployed	11	23.9	10	18.5	35	54.7	21	58.3
Mother's occupation	Employed	14	30.4	19	35.2	12	18.8	4	11.1
	House Wife	32	69.6	35	64.8	52	81.3	32	88.9

Table (1) shows prevalence of urinary tract infection in urban and rural area in relation with socio-demographic data. Ages ranges 11-14 years old for both gender, large numbers of students were among ages 12 (43.5%) and 14 (57.8%) years old in each rural and urban area respectively. The prevalence of UTI among female were higher (76.1%) in urban than in rural area (57%) in reversely to UTI among males students which is higher in rural area (45.3%) than males in urban area (23.9%). High percentages of students father (41.3%) and (54.7%) were governmental employed and unemployed for each urban and rural area respectively. (69.6%) and (81.3%) of their mothers were house wife in urban and rural area.

Table (2): Association between residency area and Symptoms of UTI in study samples.

Symptoms		Residency Area							
		URBAN (n=100)				RURAL (n=100)			
		Positive UTI		Negative UTI		Positive UTI		Negative UTI	
		F	%	F	%	F.	%	F	%
Burning Sensation	Yes	14	30.4	15	27.8	25	39.1	14	38.9
	No	21	45.7	28	51.9	35	54.7	19	52.8
	Some time	11	23.9	11	20.4	4	6.3	3	8.3
Frequency	Yes	17	37.0	20	37.0	30	46.9	7	19.4
	No	21	45.7	24	44.4	25	39.1	27	75.0
	Some time	8	17.4	10	18.5	9	14.1	2	5.6
Back Pain	Yes	7	15.2	8	14.8	29	45.3	10	27.8
	No	31	67.4	36	66.7	29	45.3	19	52.8
	Some time	8	17.4	10	18.5	6	9.4	7	19.4
Lower Abdominal Pain	Yes	12	26.1	9	16.7	20	31.3	9	25.0
	No	27	58.7	33	61.1	31	48.4	22	61.1
	Some time	7	15.2	12	22.2	13	20.3	5	13.9
Fever or Chills	Yes	10	21.7	6	11.1	9	14.1	6	16.7
	No	25	54.3	35	64.8	42	65.6	26	72.2
	Some time	11	23.9	13	24.1	13	20.3	4	11.1
Nucturia	Yes	21	45.7	17	31.5	10	15.6	10	27.8
	No	15	32.6	22	40.7	39	60.9	21	58.3
	Some time	10	21.7	15	27.8	15	23.4	5	13.9
Change in Color	Yes	9	19.6	13	24.1	14	21.9	3	8.3
	No	20	43.5	28	51.9	38	59.4	28	77.8
	Some time	17	37.0	13	24.1	12	18.8	5	13.9
Itching	Yes	17	37.0	23	42.6	9	14.1	8	22.2
	No	23	50.0	27	50.0	50	78.1	27	75.0
	Some time	6	13.0	4	7.4	5	7.8	1	2.8
Secretion	Yes	13	28.3	16	29.6	12	18.8	6	16.7
	No	25	54.3	33	61.1	50	78.1	23	63.9
	Some time	8	17.4	5	9.3	2	3.1	7	19.4
Loss of Appetite	Yes	26	56.5	14	25.9	19	29.7	6	16.7
	No	15	32.6	31	57.4	36	56.3	20	55.6
	Some time	5	10.9	9	16.7	9	14.1	10	27.8

Table (2) shows that the major symptoms were (56.5%, 45.7%, 37%, 37%, and 30.4%) of students in urban area were suffering from (lose of appetite, nocturnal, itching, frequent urination and burning sensation) respectively, While (46.9%, 45.3% and 39.1%) of students in rural area were suffering from (frequent urination, back pain and burning sensation) respectively.

Table (3): Association between UTI and roles of prevention in urban and rural area by their child families .

Prevention			Residency Area							
			URBAN (n=100)				RURAL (n=100)			
			Positive UTI		Negative UTI		Positive UTI		Negative UTI	
			F	%	F	%	F	%	F	%
Drink Lots of Water		Yes	26	56.5	30	55.6	31	48.4	19	52.8
		No	10	21.7	14	25.9	26	40.6	6	16.7
		Some time	10	21.7	10	18.5	7	10.9	11	30.6
Drink Acidity Juice		Yes	17	37.0	27	50.0	32	50.0	20	55.6
		No	14	30.4	15	27.8	28	43.8	11	30.6
		Some time	15	32.6	12	22.2	4	6.3	5	13.9
Urinate Frequently		Yes	24	52.2	22	40.7	35	54.7	14	38.9
		No	7	15.2	22	40.7	19	29.7	16	44.4
		Some time	15	32.6	10	18.5	10	15.6	6	16.7
Wear Cotton Underwear		Yes	17	37.0	22	40.7	34	53.1	20	55.6
		No	16	34.8	25	46.3	24	37.5	14	38.9
		Some time	13	28.3	7	13.0	5	7.8	2	5.6
Loose Fitting Clothes		Yes	13	28.3	21	38.9	22	34.4	18	50.0
		No	25	54.3	16	29.6	34	53.1	17	47.2
		Some time	8	17.4	17	31.5	8	12.5	1	2.8
Avoid Tight ting Jeans		Yes	18	39.1	22	40.7	34	53.1	18	50.0
		No	17	37.0	27	50.0	22	34.4	16	44.4
		Some time	11	23.9	5	9.3	8	12.5	2	5.6
Wiping from in front to Back		Yes	34	73.9	32	59.3	20	31.3	11	30.6
		No	6	13.0	12	22.2	41	64.1	25	69.4
		Some time	6	13.0	10	18.5	3	4.7	0	.0
Hand Washing		Yes	34	73.9	37	68.5	25	39.1	20	55.6
		No	7	15.2	11	20.4	36	56.3	16	44.4
		Some time	5	10.9	6	11.1	3	4.7	0	.0
Food Habit as a Daily	Eat Meat	Yes	29	63.0	32	59.3	29	45.3	19	52.8
		No	7	15.2	10	18.5	15	23.4	5	13.9
		Some time	10	21.7	12	22.2	20	31.3	12	33.3
	Drink Milk or Milk Product	Yes	28	60.9	17	31.5	28	43.8	22	61.1
		No	18	39.1	25	46.3	19	29.7	6	16.7
		Some time	0	.0	12	22.2	17	26.6	8	22.2
	Tomato	Yes	13	28.3	19	35.2	38	59.4	18	50.0
		No	27	58.7	24	44.4	15	23.4	9	25.0
		Some time	6	13.0	11	20.4	11	17.2	9	25.0

Table (3) shows relation between UTI and roles of prevention in urban and rural area, large numbers of students in urban area were preventing themselves by hand washing (68.5%), wiping from in front to back (59.3%), drinks lots of water (55.6%), avoid drink acidity juice (50%), drink milk or milk product (46.3%) not eating too much tomato (44.4%), urinate frequently (40.7%), wear cotton under wear (40.7%). Approximately same results was found in rural area for hand washing(55.6%), avoid drinking acidity juice (55.6%), wearing cotton under wear (55.6%),

drinks lots of water (52.8%), loose fitting clothes (50%), avoid tightening jeans (50%), and not eating tomato (50%).

Table (4) General difference between study samples and urban and rural areas
In UTI.

Urinary Tract Infection	Residency area	F	Mean	Std. Deviation	Std. Error Mean
	Urban	100	1.54	0.501	0.050
	Rural	100	1.36	0.482	0.048

This table shows that there were significant difference (P=0.10) between UTI in urban and rural area.

DISCUSSION :

In present study the incidence of UTI among female higher in urban area 76.1% than rural area (54.7%), contrarily to the males percentages which is higher in rural area (45.3%) than in urban area (23.9%). The higher incidence of UTI female than male might be as a result of variety of factors, such as the close proximity of the female urethral meatus to the anus [6] and incomplete and in coordinate voiding of urine in school girls which is often associated with constipation and encourages infection of the urinary tract [7]. Alternatively, vaginal microbial flora also play a critical role in encouraging vaginal colonization with coliforms and this can lead to urinary tract infection [6]. Female anatomic feature also contributes to higher prevalence among the female subject. This finding is agreed with earlier studies [8,9]. While the high prevalence of UTI among males in rural than urban area due to the fact that susceptible males to UTI having different urethral flora from that in males not susceptible to UTI.

Most Symptoms noted in the majority of the patients were note indicative of UTI, referable to the renal system, this due to their strategies of UTI prevention which primarily include proper hygienic practice such as hand washing, wiping from front to back, frequent urination were obvious rules of prevention in both areas as similar reported studies [10,11].

There were predominant numbers of negative urinalysis test among students whose mothers were house wife; they might have effective roles in educating their children.

CONCLUSIONS:

Significant difference was found between rural and urban area, age factors were initially to be responsible for the difference in prevalence.

RECOMMENDATION:

Further research is needed to optimize the evaluation phase following the diagnosis of UTI in order to improve quality of care and decrease cost. In addition, there is a need for greater education among parents and healthcare providers regarding the prevention of UTI .

REFERENCES :

1. Casullo VA, Bottone E, Herold BC. Peptostreptococcus asaccharolyticus renal abscess: a rare cause of fever of unknown origin. *Pediatrics.* 2001;107:E11
2. .Larcomb J.Urinary tract infection in children.Clin Evid concis 2005;13:92-5.
3. Conway PH,Cnnan A, Zaoutuis T, Henry BV,Keren R. Recurrent UTI in children: risk factors and association with prophylactic antimicrobials. JAMA 2007;298:179-86.
4. Struthers S, Scanlon J, Parker K, Goddard J, Hallett R. Parental reporting of smelly urine and urinary tract infection. Arch Dis Child 2003;88:250-2.
5. Coulthard MG, Lambert HJ, Keir MJ: Occurrence of renal scars in children after their first referral for urinary tract infection. British Medical Journal 1997, 315(7113):918-9.)
6. Goldman M, Lahat E, Strauss S, *et al*. Imaging After Urinary Tract Infection in Male Neonates. Pediatrics 2000; 105:1232- 1235.
7. 5. Naber KG, Bergman B, Bishop MC, *et al*. Euro p e a n Association of Urology guidelines on urinary and male genital tract infections. Urologe 2003; 42:104-112.
8. Newman TB, Bernzweig JA, Takayama JI, Finch SA, Wassermann RC, Pantell RH :Urine testing and urinary tract infections in febrile infants seen in office settings: The Pediatric Research in Office Settings' Febrile Infant Study.Arch Pediatr Adolesc Med 2002; 156:44-54.
9. Aiyegoro, O.A, Igbinosa, O.O., Ogunmwonyi, I.N., Odjadjaro, E., Igbinosa, O.E. and Okoh, A.I. Afr. J. Microbiol. Res. 2007, 1, 13 – 19.
10. Anochie, J.C., Nkanginieme, K.E.O. and Eke, F.U. Niger J. Paediatr. 2001, 28, 39 – 42.
11. Pennesi M, Travan L, Peratoner L, et al. Is antibiotic prophylaxis in children with vesicoureteral reflux effective in preventing and renal scars? A randomized, controlled trial. Pediatrics 2008;121(6):e1489-e1494.