# A survey of urinary tract infection in febrile children under Two years old in AL-Diwania city

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<u>الخلاصة العربية</u> أجريت هذه الدراسة في مستشفى النسائية والأطفال التعليمي في مدينة الديوانية للفترة من الأول من شهر تشرين الثاني سنة ٢٠٠٨ ولغاية الأول من شهر آذار سنة ٢٠٠٩ وقد خصصت لدراسة حالات التهاب المجاري البولية لدى المرضى الذين يراجعون العيادة الاستشارية وتتراوح أعمارهم بين ٢-٢٤ شهر ويعانون من ارتفاع مفاجئ في درجة حرارة الجسم مع عدم وجود سبب واضح لهذا الارتفاع أثناء الفحص ألسريري. شملت هذه الدراسة ٢١١ مريض، فحص البول وزرع البول اجري لكل المرضى المشمولين بهذه الدراسة وقد تبين ان التهاب المجاري مسؤول عن ٢٠٩% من حالات الحمى وان نسبة الإصابة أكثر في الإناث من الذكور وفي الشهر الستة الأولى من العمر زكما بينت الدراسة إن في معظم المرضى تكثر في الإناث من الذكور وفي الشهر الستة الأولى من العمر زكما بينت الدراسة إن في معظم المرضى تكون درجة الحرارة اقل من المعلم المولية وان الحالة المرضية لأغلب المرضى مستقرة. كما اطهرت الدراسة إن معظم الذكور المصابين هم من الذين لم يختنوا بعد وان نسبة التشوهات الوراثية في الكليتين موجودة الذكور المصابين هم من الذين لم يختنوا بعد وان نسبة التشوهات التراكم المراحي الدراسة إن عليمان الذكور المولية الدراسة إن من مالات الحمى وان نسبة الإصابية المرضى تكون درجة الحرارة الم من

#### Abstract:

**Background** :UTIs in febrile children is still a problem that is frequently encountered by pediatric health care providers.

**Objective**: To establish the prevalence of urinary tract infection in febrile children < two years old in outpatient clinic. Demographic and clinical parameters.

**Methods**: A cross sectional study evolving 662 child their age < 2 years presenting to the outpatient clinic of Maternity and Teaching Hospital in AL-Diwania city with fever ( $\geq$ 38C) and did not have a definite source of infection and do not receiving antibiotics in the last 48 hr and not immunosuppressive.

**Results**: overall prevalence of UTI(growth of >10 CFU/ml) was 8.9% with high prevalence rate among ,female uncircumcised male more liable to have infection than circumcised one. Infant less than 6 months of age often presented with little symptoms and more liable to had severe infection .32% of patients has previous history of UTI. And 40% have renal system abnormality on ultrasound assessment .gram –ve bacteria is the most causative agent that responsible for infection of the urinary tract.

**Conclusion**: UTI is common cause of fever in febrile children under the age of 2 year especially in female, specific sign and symptoms of UTI are uncommon.

# **Introduction**

Over recent decades, the importance of UTI has been increasingly recognized, In particular the role of UTI as an occult cause of febrile illness in young children.(1) The epidemiology of UTI during childhood varies by age, gender, and other factors. The incidence of UTI is highest in the first year of life for all children (1%) but decreases substantially among boys after infancy (2). Clinically important infections usually occur due to bacteria, although viruses, fungi, and parasites can also cause infection. In general, bacteria infect the urinary tract by ascending from the urethra, although hematogenous infection may occur in rare instances among young infants.

The gold standard for diagnosis of UTI is growth of pathogenic bacteria in urine culture. However, diagnosis is complicated by contamination from fecal bacteria that colonize the perineal area and distal urethra. In the 1950s, Kass studies adult women and established a threshold of 100,000 CFU per ml in a voided specimen as the standard to define a positive urine culture(3). In young children, urine is frequently obtained by catheter, and 10,000 CFU/ml has often been considered the cutoff for defining UTI (4).

However, in a recent study of febrile children, Hoberman et al. noted that a high proportion (65%) of cultures with colony counts between 10,000 and 49,000 grew mixed or gram-positive organisms suggestive of contamination (5).

Unfortunately, the classic signs of UTI and pyelonephritis in older children

And adults are not present or easily discerned in the toddler or young child. Fever is the most common symptom of UTI in the infant.(6). Also the presence of another source of fever on examination, such as otitis media or other viral symptoms, does not exclude a UTI(7).

# The aim of the study:

This study was aimed to determine the prevalence of UTI in febrile children less than two year of age based on the clinical and demographical criteria of these patients, in addition, to the isolation and identification of the causative bacteria from urine sample.

# Patients and methods:

A cross sectional study was performed in Teaching Hospital of Maternity and Children in AL-Diwania city from 1<sup>st</sup> of September 2008 till 1<sup>st</sup> of march 2009 and involve children that attending the out-patient clinic and having the following criteria, body temperature  $\geq$ 38 C (axillary corrected), their age between 2 -24 months, and didn't have definite source of infection. During the study period, 662 pt were enrolled ,in 300 pt the cause of fever was diagnosed at the out-patient clinic, 151 pts were excluded because of receiving of antibiotics, and 211 patients were need laboratory test to confirm the diagnosis, all of these 211 has urine examination and urine culture. Patients with definite source of infection and those receiving antibiotics within 48 hours are excluded from the study.

All eligible patients undergo detail history and examination, urine examination and urine culture and sensitivity were routinely obtained from all children. Urine sample obtained by sterile urine bag after disinfecting of the perineum, the urine should be plated within few minutes or refrigerate within 10 minute of receipt. (if not plated), both blood and MacConkey agar plates were used, all plates were incubated at 35 C and examined 24-48 hrs, Positive result was defined as growth of single urinary tract pathogen at >10 CFU/mL(8). Also all patients with positive culture have ultrasound of the kidneys to detect abnormalities of urinary system.

The gained data were analyzed statistically by means, percentage and Chi-square (X)test at P<0.05 was done to state the validity and significance between studied parameters (9).

# Results

Six-hundred sixty two patients involve in this study, the most common diagnosis was upper respiratory tract infection 331 (50%) including rhinitis, otitis media, pharyngitis and follicular tonsillitis. Other diagnosis include bronchiolitis 86 (12.9%), gasteroenteritis 86(12.6%), pneumonia 78 (78%), while the less common diagnosis were Pyrexia of unknown origin (PUO) 11 (1.66%), lymphadenitis 8 (1.2%) and scarlet fever 5 (0.75%).

Two-hundred pt were included in this study, all of them have body temperature  $\geq$ 38 C and have no definite source of infection and need laboratory test for diagnosis. Positive urine culture (growth of single urinary tract pathogen at>10 CFU/mL)was obtained in 59 pt (8.9%) table 1

diagnosis	No,	%
Upper respiratory tract infaction	331	50%
Opper respiratory tract infection	551	50%
Bronchiolitis	86	12.9%
Gasteroentritis	84	12.6%
Pneumonia	78	11.7%
Urinary tract infection	59	8.9%
PUO	1	1.66%
Lymphadenitis	8	1.2%
Scarlet fever	5	0.75%
total	662	100%

Table 1.No.and percent of infection according to the diagnostic cases of the<br/>patients.

In table 2 ,Female were significantly affected 37 (62.7%) than male 22 (37.3%) and female are at risk for infection at any age (no significant differences p value >0.05) while in male the peak age of infection was in the first six months of life (23.7%) and then the risk were decline with age.

According to the age ,the statistical analysis using X value showed a significant variations (p<0.05) between variable olds.

# Table 2:No. and percent of patients with UTIs according to sex and age .

Characteristic features	No.of patient UTI	with	%	X value (p<0.05)
<i>Demographics</i> Sex female male	37 22		62.7% 37.3%	Significant (p<0.01)
Age(months) female 2-6 7-12 12-24	10 8 19		16.9% 14.2% 32.2%	Non- significant (p>0.01)
male 2-6 6-12 12-24	14 6 2		23.7% 10.1% 3.3%	Significant (p<0.01)
overall	59		8.9%	

Table 3 show that most patients with UTI are looks well 41(69.4%) and not toxic fever is of low grade type in most patients 36 (61%) with more frequency of infection occur among uncircumcised male 8(36.3%) and many patients have previous infection 19(32.2%) and 17 patients have abnormal ultrasound finding.

parameters.				
Clinical parameter	No. of patient	%		
General appearance	18	30.5%		
Ill	41	69.4%		
Well		61%		
Fever(C)	36	39%		
≤39	23			
>39	8	36.3%		
Circumcision	27	45.7%		
Malodor	27	45.7%		
dysurea	19			
Previous history of UTI		32.2%		
Abnormal U/S				
Finding				
female	15	40.5%		
male	2	9%		

 Table 3 No. and percent of the patients with UTI according to the clinical parameters.

Escherichia coli is the most common organism that responsible for infection 54(91.5%) with less extent proteus 4(6.7%) and only one patient have staphylococcus infection (1.6%) (table 4)

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Detected organism	No.of patients	%
Escherichia coli	54	91.5%
Proteus	4	6.7%
Staphylococcus aureus	1	1.6%
Total	59	100%

# **Discussion:**

UTI is a common cause of fever among children especially during infancy .(10). Studies from the developing countries show that UTI is responsible for about 10% of fever in children below the age of 2 years (11). In our study the incidence of UTI is close to this percent and also similar to many studies done in many countries(12-14) but the percent is much more than other studies(15) In our study female is more commonly than male, and uncircumcised male is more liable for infection and this may due to colonization of the mucosal surface of the foreskin with bacteria (16) However, some studies of females suggest that there may be genetic tendencies for UTI, such as lack of secretion of carbohydrates that protect against bacterial adherence in the urinary tract (17,18). And this is similar to many studies done around the world (11.14.18-20). Infant within the 1<sup>st</sup> 6 months are more liable to develop sever infection with high grade

fever>39 C but with very little symptoms but present with fever and looks ill and toxic on examination. And this is also revealed by other studies(21-22). Thirty two percent of patients involved in this study have previous history of UTI, which may indicate that this patients may have recurrent UTI and need more detail assessment to detect abnormality of renal system so when ultrasound examination done to all patient with proved UTI and the result was 15 girl (40%) with UTI have abnormality of renal system (and this include double ureter, ectopic kidney, absent kidney). In male only 2 patients (9%) have renal malformation (one with double ureter and one three months old with multiple renal stones) and this result similar to many studies done throughout the world(8.10) and higher than other study which reveal 20% of patients have malformations.(23)

Regarding the causative organism, our study show that E.Coli is responsible for about 91% of cases of UTI and this is similar to other studies(11.12.15.24.25).

# conclusion

So, from the result of our study we conclude that UTI is one of the important cause of fever in infants < 2 years of age and it may lead to renal scarring and renal failure as a long term complication if not suitably diagnose and treated early.

# **Recommendations:**

And we recommended that every patient below 2 years of age presented with fever without obvious source of infection should have urine analysis and urine culture as a part of routine assessment and if the diagnosis is proved then the patient should have further investigations like ultrasound.

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