# INCIDENCE OF URINARY TRACT INFECTION AMONG FEBRILE CHILDREN

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## *ABSTRACT*

Urinary tract infection (UTI) is the most common serious bacterial infection in young febrile children. The diagnosis and management of UTI in young children are clinically challenging. The aim of this study is to determine the incidence of UTI among febrile children of different ages presented with specific or non-specific symptoms suggestive of UTI. This cross sectional study was carried out on febrile children attending the outpatient clinic at Al-Hussein University Hospital from January to July 2014. A total of 200 febrile patients selected randomly aged 1-12 years were included in the study .They were 51 males and 149 females. Inclusion criteria were children from 1-12 years with explained or unexplained fever of 38ºc or higher, children with nonspecific symptoms of UTI such as lethargy, irritability, malaise, failure to thrive, vomiting, poor feeding and children with specific symptoms of UTI, such as increased frequency, dysuria, suprapubic pain, loin pain and tenderness. Exclusion criteria were patients on antibiotic treatment, patients with known history of recurrent UTI and patients with well-known urinary tract anomalies before or during the study.All patients enrolled in this study were subjected to Full history taking, clinical examination, complete urine analysis, culture and sensitivity, routine investigations as CBC, ESR, CRP and renal ultrasonography. The results clarified that dysuria was the predominant among urinary tract symptoms (6.5%) while sore throat was the predominant among symptoms other than UTI (60%). There was a statistically significant difference between febrile children and the level of Pyuria where febrile children having pus cells more than 10 / HPF considered significant for the infection, p-value is $< 0.001$. All patients with pyuria ( 16 patients) were positive for nitrite test and urine culture.

From this study, we can conclude that; unexplained fever is one of the common presenting symptoms of UTI and screening for UTI by strip nitrite test (simple, easy with immediate result) among febrile infants and children is an important mean for early detection of infection. We also recommend considering UTI in febrile patients with nonspecific symptoms or minimal symptoms of different systems.

Key words: Urinary tract infection – Febrile children – Urine culture.

## *INTRODUCTION*

Urinary tract infection (UTI) is the most common serious bacterial infection in young febrile children. Infections of the urinary tract can progress to acute pyelonephritis,

which in turn can lead to renal scarring, renal insufficiency, hypertension or renal failure necessitating dialysis(1). Many researches have indicated that the prevalence of UTI in febrile young children in the emergency department is 3% to 5% and in some groups as high as 30%(2).Girls are less likely than uncircumcised boys to present with a febrile UTI in the first few months of life. However, girls have a significantly greater risk of UTI than boys (3)**.**

Most authorities recommend routine examination and culture of the urine in febrile girls 0 to 24 months of age (2).Any abnormality resulting in obstruction to flow of urine can lead to an increased risk of UTI by promoting urinary stasis. These obstructions can be anatomic (e.g., urethral stricture, posterior urethral valves) or neurogenic, generally from congenital or acquired abnormalities of the spinal cord ***(4).***Beyond the neonatal period, fever is generally the primary symptom that leads to the diagnosis of UTI and most emergency department-based studies explicitly identify fever as inclusion criteria for pediatric UTI (2).In older verbal children the classic symptoms of dysuria, frequency, abdominal or flank pain, new-onset incontinence (often nocturnal), and fever all carry significant and useful positive likelihood ratios. However, these findings are not adequately specific to diagnose UTI and mandate laboratory evaluation (5).

It is important to note that in children under the age of 2 years, the presence of another possible source of fever such as gastroenteritis, bronchiolitis, upper respiratory infection, otitis media, does not entirely exclude UTI. Positive viral antigen studies (e.g., respiratory syncytial virus or influenza) have been associated with a significant decrease in UTI risk. However, the risk is not insignificant in young infants; respiratory syncytial virus-positive infants less than 60 days of age have 5.4% risk of UTI, compared with 10% in respiratory syncytial virus-negative infants ***(3).***

The incidence of UTI varies based on age, sex, and gender. Overall, UTI are estimated to affect 2.4%-2.8% of all children every year in the United States. The international incidence of UTI is difficult to accurately assess especially in developing countries, but is assumed to be similar to that in the United States(6). Occurrences of first-time symptomatic UTI are highest in boys and girls during the first year of life and

markedly decrease after that. The minimum cumulative incidence in boys and girls aged 2 years is slightly over 2%. As many as 5% of children below age 2 years who present to the emergency department with fever have a UTI(6). Asymptomatic bacteruria is defined by a specific colony count usually greater than $10^5$cfu /ml using urine culture in an infant or child without symptoms of a UTI (7). The frequency of asymptomatic bacteruria is 0.4% to 1.8% in females and 0.5% to 2.5% in males at the infant ages. This frequency changed to 0.8% to 1.3% and 0.0% to 0.5% respectively in preschool and school age children(8). Screening studies in emergency departments suggest that up to 5% of children under the age of 2 years presenting with fever have UTI and over half of these children have been given alternative diagnosis such as otitis media before urine testing(5)**.**The frequency of re-infection during the first year after an episode of febrile UTI has been estimated to be up to 30 % (2).

The diagnosis and management of urinary tract infections (UTI) in young children are clinically challenging. Studies have provided demographic features (age, race, and gender) and clinical characteristics (height and duration of fever, other causes of fever, and circumcision) that can help clinicians identify febrile infants whose low risk of UTI obviates the need for further evaluation. There is a significant risk of renal scarring among children with febrile UTI, and some evidence suggests that early antimicrobial treatment mitigates that risk (9).

## *AIM OF THE WORK*

The aim of this study is to determine the incidence of UTI among febrile children of different ages presented with specific or non-specific symptoms suggestive of UTI in Al-Hussein University Hospital.

## *PATIENTS AND METHODS*

**Patients**:

This cross sectional study was carried out from January 2014 to July 2014.A total of 200 patients aged 1-12 years of febrile children attending the outpatient clinic at Al-Hussein University Hospital were included in the study .They were 51 males and 149 females. All included children were divided into two age groups:-

Group I: Children aged 1-5 years and included 120 patients.

Group II: Children aged 5 -12 years and included 80 patients.

**Inclusion criteria of the study:**

1. Children from 1-12 years with either explained or un-explained fever of 38°C or higher.
2. Children with non-specific symptoms of UTI such as lethargy, irritability, malaise, failure to thrive, vomiting and poor feeding.
3. Children with specific symptoms of UTI, such as increased frequency, dysuria, suprapubic pain, loin pain and tenderness.

**Exclusion Criteria:**

1. Patients on antibiotic treatment.
2. Patients with known history of recurrent UTI
3. Patients with well-known urinary tract anomalies (before or during the study).

**Methods:**

**All patients enrolled in this study were subjected to:**

**A) Full history taking laying stress upon the presence of:**

1. Fever
2. Non-specific symptoms of UTI.
3. Specific symptoms of UTI.
4. History of a previous documented UTI and known urinary tract anomalies.

**B) Thorough clinical examination:** including:

**1. General examination:** Especially for vital signs, signs of inflammation or a focus of infection and systemic examination.

**2. Local abdominal examination:** for renal mass, loin tenderness, ascites or organomegally.

**C) Complete urine analysis, culture and sensitivity:**

Urine samples have been collected using midstream clean-catch technique in sterile urine containers for older children and sterile urine bags for infants after education of the child's mother by simple cleaning of child's external genitalia by ordinary tape water after hand washing. The urine was divided into two parts. The first part was labeled, and immediately used for complete urine analysis laying stress upon nitrite test (the un-centrifuged urine specimens were tested by a colorimetric Combur-10 multi-reagent test strips which based on conversion of nitrate to nitrite by bacteria in the urine with production of pink to red coloration of test area of the strip) and pyuria after urine centrifugation and microscopic examination by high power field (HPF) counting .The second part was labeled, sealed and used for urine culture and antibiotic sensitivity testing if there is pyuria ≥ 10\HPF or positive for nitrite of

the first part. The urine sample was cultured immediately on blood and MacConkey agar plates and incubated aerobically for 24 hours at 37°C.The significant bacterial isolates were identified by standard procedures and they were subjected to antibiotic susceptibility testing by disc diffusion method.

**D) Routine investigations:** includes:

* Erythrocyte sedimentation rate (ESR) by Westergren method.
* C-Reactive protein (CRP) by semi-quantitative latex method.
* Complete Blood count (CBC) done by automated cell counter using cell dyne 1700 instrument.

**E) Renal Ultrasound:** for exclusion of children with significant urinary tract anomalies**.**

**Data Management & Statistical Analysis:** Statistical presentation and analysis of the present study was conducted, using the mean, standard error, unpaired student t-test and chi-square by SPSS V17.

## *RESULTS*

A total of 200 patients enrolled in the study, 149 were females (74.5%) and 51 were males (25.5%) divided to group I (1-5 years, 60% ) and group II (5-12 years , 40% ) table (1). Dysuria was the predominant among urinary tract symptoms (6.5%) while sore throat was the predominant among symptoms other than UTI (60%). Cough, abd. Pain, vomiting & diarrhea, poor feeding and loin pain represent 14.5%, 5%, 4.5%, 3%, 2.5% respectively. Other symptoms as irritability, ear-ache, and increased frequency were less frequent and represent only 1.5%, 1%, and 0.5% respectively

**Table (1): Demographic data in the studied cases (Age and Sex).**

| | N | % |
|---|---|---|
| **Age (years)** | | |
| **Group I : 1-5.** | 120 | 60.00 |
| **Group II: 5-12.** | 80 | 40.00 |
| **Sex** | | |
| **Male** | 51 | 25.50 |
| **Female** | 149 | 74.50 |

**Table (2): Distribution of children according to their residence, mother's education and social status.**

| Patients group / parametres | FUTI children | | | | | | Chi-Square | |
|---|---|---|---|---|---|---|---|---|
| | Negative | | Positive | | Total | | | |
| | N | % | N | % | N | % | $X^2$ | P-value |
| **1- Residence** | | | | | | | | |
| **Rural** | 96 | 48.00 | 8 | 4.00 | 104 | 52.00 | 21.400 | <0.001* (significant) |
| **Semi Urban** | 82 | 41.00 | 7 | 3.50 | 89 | 44.50 | | |
| **Urban** | 6 | 3.00 | 1 | 0.50 | 7 | 3.50 | | |
| **2- Mother's education** | | | | | | | | |
| **Illiterate** | 68 | 34.00 | 7 | 3.50 | 75 | 37.50 | 23.700 | <0.001* (significant) |
| **Primary education** | 58 | 29.00 | 6 | 3.00 | 64 | 32.00 | | |
| **Secondary education** | 36 | 18.00 | 2 | 1.00 | 38 | 19.00 | | |
| **High education** | 22 | 11.00 | 1 | 0.50 | 23 | 11.50 | | |
| **3- Social Status** | | | | | | | | |
| **Low** | 140 | 70.00 | 13 | 6.50 | 153 | 76.50 | 29.500 | <0.001* (significant) |
| **Average** | 44 | 22.00 | 3 | 1.50 | 47 | 23.50 | | |

This table shows that there was a statistically significant difference between children having UTI and their residence, mother's education and social status where p-value is < 0.001 ( the majority of cases were from rural, semi-urban areas, illiterate, primary education mothers and low social status).

**Table (3): Frequency distribution of patients complaining of fever only, fever with symptoms suggestive of UTI and fever with other symptoms.**

| Symptoms | | |
|---|---|---|
| | **N** | **%** |
| **Fever only** | 2 | 1.00 |
| **Fever with suggestive symptoms of UTI** | 14 | 7.00 |
| **Fever with other symptoms** | 184 | 92.00 |
| **Total** | 200 | 100.00 |

This table shows that frequency distribution of patients complaining of fever only was two cases ( 1% ) , fever with symptoms suggestive of UTI was 14 cases ( 7% ) and fever with other symptoms was 184 cases (92%).

**Table (4): Distribution of different symptoms among febrile children >38c$^{o}$ .**

| Symptoms | Results | |
|---|---|---|
| | N | % |
| **Sore Throat** | 120 | 60.00 |
| **Cough** | 29 | 14.50 |
| **Dysuria** | 13 | 6.50 |
| **Abd.pain** | 10 | 5.00 |
| **Vomiting & diarrhea** | 9 | 4.50 |
| **Poor feeding** | 6 | 3.00 |
| **Loin Pain** | 5 | 2.50 |
| **Irritability** | 3 | 1.50 |
| **Ear-ache** | 2 | 1.00 |
| **Increased frequency** | 1 | 0.50 |
| **Fever only** | 2 | 1.00 |

This table shows that dysuria was the predominant among urinary tract symptoms (6.5%) while sore throat was the predominant among symptoms other than UTI (60%).

**Table (5): Distribution of UTI among febrile children as regard to age.**

| Age groups | FUTI children | | | | | | Chi-Square | |
|---|---|---|---|---|---|---|---|---|
| | Negative | | Positive | | Total | | | |
| | N | % | N | % | N | % | $X^2$ | P-value |
| **1-5. years** | 115 | 57.50 | 5 | 2.50 | 120 | 60.00 | 4.758 | 0.029* (significant) |
| **5-12.years** | 69 | 34.50 | 11 | 5.50 | 80 | 40.00 | | |
| **Total** | 184 | 92.00 | 16 | 8.00 | 200 | 100.00 | | |

This table shows that there was a statistically significant difference between febrile UTI children and their age groups where age group from 1-5 years (-ve children 57.5% and +ve children 2.5%) and the age group from 5-12 years (-ve children 34.5% and +ve children 5.5%), p-value is 0.029.

**Table (6): Distribution of UTI among febrile children as regard to sex.**

| Gender | FUTI children | | | | | | Chi-Square | |
|---|---|---|---|---|---|---|---|---|
| | Negative | | Positive | | Total | | | |
| | N | % | N | % | N | % | $X^2$ | P-value |
| **Male** | 46 | 23.00 | 5 | 2.50 | 51 | 25.5 | 0.063 | 0.802 (insig.) |
| **Female** | 138 | 69.00 | 11 | 5.50 | 149 | 74.5 | | |
| **Total** | 184 | 92.00 | 16 | 8.00 | 200 | 100.00 | | |

This table shows that there was no significant difference between febrile UTI children and their sex.

**Table (7): Laboratory data in the FUTI group ( n = 16 ).**

| Laboratory investigation | Mean ± SD | Range |
|---|---|---|
| **Hemoglobin (gm / dl)** | 11.64±1.52 | 8.3 – 14.6 |
| **WBCs (10 thousand / cmm)** | 11.19 ± 4.01 | 5.1 – 29.5 |
| **Platelets (10 thousand/cmm)** | 342.52±127.48 | 98 - 668 |
| **ESR (mm)** | 16.18±9.16 | 3 - 45 |

This table shows that some cases showed leukocytosis and elevated ESR but these laboratory data are non-specific and unreliable for diagnosis of UTI. The sure diagnosis is only by urine culture and sensitivity.

**Table (8): Percentage of cases in relation to CRP results.**

| CRP mg/l | N | % |
|---|---|---|
| **+ve > 6** | **2** | **12.50** |
| **-ve < 6** | **14** | **87.50** |

This table shows that only two cases out of 16 children with UTI had +ve CRP.

**Table (9): Distribution of children according to the presence of pyuria.**

| Urine analysis | Pus Cells: | | | T-Test | |
|---|---|---|---|---|---|
| | N | Range | Mean ± SD | t | P-value |
| Negative | 184 | 2 - 9/HPF | 6.049 ± 2.221 | -17.093 | <0.001* (significant) |
| Positive | 16 | 12 - 100/HPF | 37.625 ± 24.554 | | |

This table shows that there was a statistically significant difference between febrile children and the level of Pyuria where p-value is < 0.001.

**Table (10): Distribution of children according to the results of dipsticks urine testing for nitrites**

| | Dipsticks | | Chi-Square | |
|---|---|---|---|---|
| | No. of cases | % of cases | t | P-value |
| Negative | 184 | 92.00 | -17.093 | <0.001* (significant) |
| Positive | 16 | 8.00 | | |
| Total | 200 | 100 | | |

This table shows that all patients with pyuria( 16 patients) were positive for nitrite test p< 0.001.

**Table (11): Urine culture results among febrile children having UTI**

| Culture (done) | Culture results | | | | | | Chi-Square | |
|---|---|---|---|---|---|---|---|---|
| | Negative | | Positive | | Total | | | |
| | N | % | N | % | N | % | $X^2$ | P-value |
| Yes | 0 | 0 | 16 | 8 | 16 | 8.00 | 186.644 | <0.001* (significant) |
| Total | 184 | 92 | 16 | 8 | 200 | 100.00 | | |

This table shows that all febrile patients with pyuria have +ve urine culture for microorganisms.

**Table (12): Results of urine culture according to age**

| Age<br>organism | 1-5 years | 5-12 years | % of cases |
|---|---|---|---|
| E-coli | 4 | 8 | 75 |
| Staph. aureus | 1 | 3 | 25 |
| Total | 5 | 11 | 100 |

This table shows that E-Coli formed 75% ( 4 cases from 1-5 years and 8 cases from 5-12 years ) of +ve cultures while staph-aureus represented only 25% of cases ( one case from 1-5 years and 3 cases from 5-12 years ) of +ve cultures .

**Table (13):Renal ultrasound findings in patients with UTI.**

| **Pelvi abdominal U/S** | | |
|---|---|---|
| | **N** | **%** |
| **Normal** | 12 | 75.00 |
| **Increased bladder wall thickness** | 2 | 12.5 |
| **Nephrocalcinosis** | 1 | 6.25 |
| **Mild Bilateral Hydroureter** | 1 | 6.25 |
| **Total** | 16 | 100.00 |

This table shows that out of the total studied cases of UTI ( 16 patients), there were no abnormal findings in 75% of cases by renal US, other 25% cases showed mild abnormalities. These abnormalities were: 12.5 % showed increased bladder wall thickness, 6.25% showed mild bilateral hydroureter and 6.25 % showed nephrocalcinosis.

## *DISCUSSION*

The main presenting symptom of our studied febrile children was sore throat (60% of all cases). On the other hand, patients presented with specific and non - specific symptoms of UTI showed that, dysuria was the predominant symptom representing 6.5%, followed by abdominal pain 5%, vomiting and diarrhea 4.5%, poor feeding 3%, irritability 1.5%, loin pain 2.5%, increased frequency 0.5% and those presented with fever only 1%.The frequency and percentage of patients complaining of fever with urinary symptoms 7% and fever with other symptoms

92%.Our study simulate those done by Bachur and Harper (10), Zorc et al., (11), Aiyergoro et al., (12), Morris et al., (13), and Lin et al., (14).

Our results coincide with those obtained by Aiyegoro et al., where 8% of patients presented with dysuria, 4 % with abdominal pain, 2.5 % of patients with loin pain, 2.5% of patients with poor feeding, 1% of patients with irritability and 1% of patients with increased frequency (12).

Patients presenting with symptoms other than UTI symptoms were representing 92% of all cases where sore throat was the main presenting symptom and representing 60% of patients while lower respiratory tract infection. represented by 14.5% of patient, vomiting and diarrhea 4.5% of patients, earache was 1% of patients, abd. Pain 5%, poor feeding 3%, irritability 1.5% and loin Pain 2.5% of patients. Also the study done by Aiyegoro et al., showed that 80% of their cases with fever presented with symptoms other than UTI symptoms. Sore throat was the predominant symptom of their cases and represented 53%, chest infection was representing 14% of patient, vomiting and diarrhea 4% of patients, earache 1% of patients, abd. Pain 4%, poor feeding 2.5%, irritability 1 %, loin Pain 2.5 % and those with fever only 10% of patients (12). The difference between these data and our study can be explained by small sample size in our study, the variation in the time of presentation as well as the onset of fever. Although these results differ from our findings in the percentages of cases under each complaint, yet there is an agreement that a large proportion of cases presented in both studies with non -urinary symptoms.

Out of 200 febrile children who attended pediatric outpatient clinic, 16 patients proved to have UTI (8%). This percentage is comparable to many studies conducted by many researches in different places [ Jeena PM et al. (15); Okwara FN et al. (16) and Ashok C et al. (17), and showed that percentage ranged from 3.3% - 7.5%]. In the present study, the percentage of UTI among febrile children according to their ages showed a higher percentage of infection in the age group from 5-12 years than those under 5 years of age (5.5% and 2.5% respectively). The difference was statistically significant (P=0.029). On the other hand the distribution of UTI according to sex showed no significant difference between males and females (P= 0.802). These results simulate those done

by Bachur and Harper (10), Zorc et al., (11),Aiyergoro et al., (12), Morris et al., (13) and Lin et al., (14).

In our study we found that the predominating cause of fever other than UTI was pharyngitis representing 65.22 % of patients while bronchiolitis represented only 15.76 %, gastroenteritis 12.5%, otitis media 1.09%, rhino- sinusitis 1.09%, tonsillitis 3.8% and skin Infection 0.54%. Our results go with those reported by Aiyegoro et al., where pharyngitis was the main cause of fever and represented 64 % of their patients, bronchiolitis was present in only 16.5%, gastroenteritis in 9.5%, tonsillitis 6.5%, otitis media 2% and rhino-sinusitis 1.5% of patients (12).

As regard, the organisms obtained in urine cultures in order of frequency in our study, E.coli was the highest followed by gram positive staphylococci. This is similar to the studies done by Bachur and Harper (10 ), Saleh et al., (18 ),Zorc et al.,(11 ),Aiyogoro et al., (12) and Shaw et al., ( 19 ) where the highest prevalence was that of E.coli and the second common organism was gram positive cocci.

As regard to urine culture results performed in patients with significant pyuria in our study we found that all patients had positive results in urine cultures. Similar results were seen in the study performed by Ashock C et al., where urine culture results were positive in all children with significant pyuria (17).Also all children with significant pyuria showed a positive dipsticks urine test for nitrites. Our results go with those reported by Lin et al., where the diagnosis was based on urine analysis and urine dipsticks, they reported that all children with pyuria had a positive dipsticks test for nitrites (20).

In our study a total number of 16 renal U\S were performed for patients with documented UTI (using urine culture and sensitivity). Out of the total studied cases 75% were normal and 25% showed mild abnormalities. These abnormalities were: 12.5 % showed increased bladder wall thickness, 6.25% showed mild bilateral hydroureter and 6.25 % showed nephrocalcinosis. Montini et al., reported that renal U/S done for 262 children aged from one month to seven years, presenting with first febrile UTIs and normal prenatal U/S showed that, 13% abnormalities, which were generally minor as dilated pelvis, ureter, and calyces as well as

increased bladder wall thickness (21).Another study by Hoberman et al., showed that U/S done for 309 febrile patients with symptoms suggestive of UTI, revealed only 12% abnormalities in the form of (dilated pelvis, pelviectasis, hydronephrosis, dilated ureter and calculus) (22).

In our study a total number of 16 CRP, CBC and ESR were performed for patients with documented UTI ( using urine culture and sensitivity). Out of the total studied cases only one case out of 16 children with UTI had +ve CRP representing 6.25% of total cases. According to CBC & ESR results few cases showed non-specific anemia, leukocytosis and elevated ESR. Similar results were seen in the study performed by Aiyegoro et al., for children with +ve urine culture results where normal CRP results were seen in most cases. Anemia and leukocytosis as well as elevated ESR on the other hand were present in a small number of cases, they reported that these laboratory parameters are non-specific and unreliable for diagnosis of UTI (12).

Our results signify that fever is an important sign of UTI whether associated with an evident source of infection or not.

## *CONCLUSION*

**From this study, we can conclude that:-**

- Unexplained fever is one of the common presenting symptoms of UTI.
- UTI in infants and children can be asymptomatic or can present with fever and non -specific symptoms which could be masked by other causes as tonsillitis, otitis media or gastroenteritis.
- Screening for UTI among febrile infants and children is an important method for early detection of infection even if there is evidence of infection outside the urinary tract.
- In spite of urine culture remains the gold standard for the detection of UTI, the nitrite test of un-centrifuged urine was observed to be good screening test for UTI.

**From this study, we can recommend that:-**

It is important to perform urine analysis for patients presented with fever without focus and to perform urine analysis followed by culture and sensitivity for patients presenting with fever and

non-specific symptoms as it may be related to UTI and may lead to under estimating the child condition.

## *REFERENCES*


1. Keren, R (2008): Introduction. Pediatrics, Vol. 122 No. Supplement 5 pp. S231-2.
2. Shaw, K.N, McGowan, K.L, Gorelick, M.H and Schwartz, J.S (2008): Screening for Urinary Tract Infection in Infants in the Emergency Department: Which Test Is Best? Pediatrics, Vol. 101 No.3 p-1542-7.
3. Bhat, R.G, Katy, T.A, Place, F.C (2011): Pediatric Urinary Tract Infection. Emerg Med Clin North Am,Vol. 29. No.3 p.637-53.
4. Lim, R (2009): Vesicoureteral reflux and urinary tract infection, evolving practices and current controversies in pediatric imaging. AJR Am J Roentgenol, Vol.109 p 1197–208.
5. Shaikh, N, Morone, N.E, Lopez. J, et al (2007): Does this child have a urinary tract infection? JAMA, Vol.298 p.2895–904.
6. Fisher DJ (2012): Pediatric urinary tract infection. Emedicine Medscape. Retrieved from http: //emedicine. medscape. com/ article/ 969643-overview
7. Peterside F and Wokoma N (2009): Prevalence of asymptomatic bacteriuria in students of University of Port Harcourt Demonstration Secondary School. J ApplSci Environ Manage; 13(2): 55 – 58.
8. Shoff WH (2012): Asymptomatic bacteruria. Emedicine Medscape. Retrieved from http: //emedicine. medscape. com/ article/ 2059290-overview
9. Finnell SME, Carroll AE, Downs SM, et al. (2011): Diagnosis and Management of an Initial UTI in Febrile Infants and Young children. Pediatrics; 128 (3): e749– 70.
10. Bachur, R, Harper, M.B. (2001): Reliability of the urinalysis for predicting urinary tract infections in young febrile children. Arch Pediatr Adolesc Med, Vol.155 P60-5
11. Zorc, J.J, Kiddoo, D.A, and Shaw, K.N (2005): Diagnosis and Management of Pediatric Urinary Tract Infections. Clinical microbiology reviews, Vol.18 No.2 p. 417–22.
12. Aiyegoro O. A., Igbinosa O. O., Ogunmwonyi I. N., Odjadjare E. E., Igbinosa O. E. and Okoh A.(2007): Incidence of urinary tract infections (UTI) among children.www.academic journals.org/journal/AJMR/article-abstract/311673210765
13 Morris CM, Tefurani N, Ripa P, Laki R and Vince JD (2007): Urinary tract infection in infants and young children presenting with fever without a focus in Port Moresby. PNG Med J.;50 (3-4): 145-151
14 Lin CW, Chiou YH, Chen YY, Yung-Feng Huang, Hsieh KS and Sung PK (2009): Urinary Tract Infection in Neonates Clinical Neonatology; 6 (2): 1-4.
15. Jeena PM, Coovadia HM, Adhikari M (2002): Probable association between urinary tract infections UTI and common diseases of infancy and childhood: a hospital-based study of UTI in Durban, South Africa. J Trop Pediatr 42(2):112-4.

16. Okwara FN, Obimbo EM, Wafula EM and Murila FV (2004): Bacteraemia, Urinary Tract Infection and Malaria in Hospitalized Febrile Children in Nairobi: Is there an Association? East Afr Med J. 81: 47-51.

17. Ashok C, Kumar GV, Viswanathakumar HM (2013): Study of the prevalence and clinical profile of urinary tract infection in febrile children aged 3 - 6 years who attended pediatric outpatient department in a tertiary care hospital. Int J Health Sci Res. 2013;3(2):1-

18. Saleh SI, Tuhmaz MM, Sarkhouh MY and El-Ghawabi MA (2003): Urinary Tract Infection in Infants and Children in Al-Jahra Area, Kuwait: An Overview Kuwait Medical Journal; 35 (1): 31-35.

19. Shaw KN, Gorelick M, McGowan KL, Yakscoe NM and Schwartz JS (2008): Prevalence of Urinary Tract Infection in Febrile Young Children in the Emergency Department. Pediatrics; 102 (16).

20. Lin DS, Huang SH and Lin CC (2009): Urinary tract infection in febrile infants younger than 8 weeks of age. Pediatrics; 105 (2): 1-4.

21. Montini G, Tullus K and Hewitt L (2011): Febrile Urinary Tract Infections in Children. New England Journal of Medicine; 365(3): 239-50.

22. Hoberman A and Wald ER (2007): Urinary tract infections in young febrile children. Pediatr Infect Dis J.; 16: 11-17.

# تقييم نسبة انتشار عدوى المسالك البولية لدى الأطفال المحمومين

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تم إجراء هذه الدراسة للكشف عن مدي انتشار عدوى المسالك البولية بين الأطفال المصابين بالحمي الذين تتراوح أعمارهم بين سنة و12سنة بمستشفي الحسين الجامعي بجامعة الأزهر. لقد شملت الدراسة مائتي طفل مريض، 51 (25.5%) من الذكور و149 (74.5%) من الإناث.

لقد تم تجميع عينات البول بإستخدام العينات النظيفة للبول من الأطفال الأكبر سناً وبإستخدام أكياس البول للأطفال الرضع وتم تقسيم عينة البول الي جزأين لكل مريض . العينة الأولي لعمل فحص بول كامل تم فحص عينات البول وبالأخص قياس النيتريت وعد الخلايا الصديدية بعد عملية الطرد المركزي. العينة الثانية لعمل مزرعة البول علي أطباق أجار الدم والماكونكي في حالة ايجابية العينة الأولي للنيتريت أو الخلايا الصديدية (10 خلايا أو أكثر لكل حقل مجهري) وتحضن عند 37 درجة لمدة 24 ساعة بعدها يتم قراءة المزارع وتحديد نوع البكتريا ثم يتم عمل حساسية للمضادات الحيوية و بعد ذلك يتم عمل أشعه بالموجات فوق الصوتية للكلي والجهاز البولي وذلك لتقييم مدى إنتشار عدوى المسالك البولية لدى الأطفال المحمومين.

لقد توصلت الدراسة إلى أن 16 مريضا (8%) من إجمالي 200 حالة أظهروا نتائج موجبة لوجود النيتريت، وكان عدد الخلايا الصديدية أكثر من 10 خلايا في الحقل المجهري و كانت نتائج مزارع الدم لديهم موجبة، خمسة اطفال من الذكور ( 2.5 % ) و احدي عشر طفلا من الإناث (5.5 %)

وقد كشفت الدراسة أيضاً عن مدى إنتشار العدوى بين الأطفال من سن سنة إلى سن خمس سنوات حيث كان هناك خمسة أطفال بنسبة 2.5% ، و الأطفال من سن خمس سنوات الي سن 12 سنة كان هناك احدي عشر طفلا بنسبة 5.5 % .

وقد أظهرت مزارع البول النتائج التالية حيث كانت بكتريا الايشيريشيا كولاي الأكثر انتشارا بنسبة 75% يليها المكورات العنقودية بنسبة 25% وكان الاميكاسين اكثر المضادات الحيوية حساسية للبكتريا بنسبة 75%.

أما عن الأطفال المصابين بالحمى نتيجة أسباب أخرى غير عدوى المسالك البولية فكانت النتائج على النحو التالي: إلتهاب الحلق 65.22% والتهابات الجهاز التنفسي العلوي والسفلي 15.76% و12.5% نزلة معوية حادة و1.09% إلتهاب الأذن الوسطى وإلتهاب اللوزتين 3.8% وإلتهاب الجيوب الأنفية 1.09% ثم 0.54% للعدوى الجلدية.

لذلك تمثل عدوى المسالك البولية سببا مهما للحمى عند الأطفال، لذا يجب عمل تحليل بول كامل مع التركيز علي اختبار النيترايت وكذلك عدد الخلايا الصديدية لاكتشاف عدوي المسالك البولية ومعرفة سبب الحمى إضافة إلى عمل مزرعة للبول وعمل حساسية للحالات الايجابية لتحديد نوع البكتريا واختيار المضاد الحيوي المناسب.