International Journal of Medical and Health Research
ISSN: 2454-9142
www.medicalsciencejournal.com
Volume 4; Issue 1; January 2018; Page No. 100-102

Monitoring of febrile urinary tract infection in children

[*1] Dr. Manoj Kumar Singh, [2] Dr. Hemant Kumar

[1] Assistant Professor, Upgraded Department of Pediatrics, Patna Medical College and Hospital, Patna, Bihar, India

[2] Associate Professor, Upgraded Department of Pediatrics, Patna Medical College and Hospital, Patna, Bihar, India

Abstract
Urinary tract infection (UTI) is an infection that affects part of the urinary tract. When it affects the lower urinary tract it is known as a bladder infection (cystitis) and when it affects the upper urinary tract it is known as kidney infection (pyelonephritis). Symptoms from a lower urinary tract include pain with urination, frequent urination, and feeling the need to urinate despite having an empty bladder.

The study was conducted at the Patna medical college and Hospital on total 73 patients. All children aged between 1 month to 10 years with a history of fever, clinical symptoms of UTI and positive urine culture with significant colony count were included in the study.

Improper toilet training practices was the commonest risk factor associated with febrile UTI in children aged 1 month to 10 years in our study, occurring in 52 cases.

Keywords: UTI, febrile, infection, etc.

Introduction

Urinary tract infection (UTI) is an infection that affects part of the urinary tract. When it affects the lower urinary tract it is known as a bladder infection (cystitis) and when it affects the upper urinary tract it is known as kidney infection (pyelonephritis). Symptoms from a lower urinary tract include pain with urination, frequent urination, and feeling the need to urinate despite having an empty bladder. Symptoms of a kidney infection include fever and flank pain usually in addition to the symptoms of a lower UTI. Rarely the urine may appear bloody. In the very old and the very young, symptoms may be vague or non-specific [1].

The most common cause of infection is Escherichia coli, though other bacteria, virus or fungi may rarely be the cause. Risk factors include female anatomy, uncircumcised male, VUR, urethral instrumentation, voiding dysfunction, anatomic abnormalities, sexual activity, malnutrition, constipation, and family history. Kidney infection, if it occurs, usually follows a bladder infection but may also result from a blood-borne infection. UTI may be suspected based on symptoms or findings on urinalysis, or both. In those with vague symptoms, sometimes diagnosis can be difficult because bacteria may be present without there being an infection. In complicated cases or if treatment fails, a urine culture may be useful [2].

In uncomplicated cases, UTIs are treated with a short course of antibiotics such as nitrofurantoin or trimethoprim /sulfamethoxazole. Resistance to many of the antibiotics used to treat this condition is increasing [1]. In complicated cases, a longer course or intravenous antibiotics may be needed. If symptoms do not improve in two or three days, further diagnostic testing may be needed [2]. Phenazopyridine may help with symptoms [1]. In those who have bacteria or white blood cells in their urine but have no symptoms, antibiotics are generally not needed, although during pregnancy is an exception. In those with frequent infections, a short course of antibiotics may be taken as soon as symptoms begin or long-term antibiotics may be used as a preventative measure [3].

UTI is a common bacterial infection in children. Because of nonspecific signs and vague symptoms in very young children, they may remain unrecognized, and therefore precise data on incidence and prevalence of UTI are not available [10].

Urinary tract infections have been described since ancient times with the first documented description in the Ebers Papyrus dated to c. 1550 BC [4].

In young children, the only symptom of a urinary tract infection (UTI) may be a fever. Because of the lack of more obvious symptoms, when females under the age of two or uncircumcised males less than a year exhibit a fever, a culture of the urine is recommended by many medical associations. Infants may feed poorly, vomit, sleep more, or show signs of jaundice. In older children, new onset urinary incontinence (loss of bladder control) may occur [5].

To make the diagnosis of a urinary tract infection in children, a positive urinary culture is required. Contamination poses a frequent challenge depending on the method of collection used, thus a cut off of 10^5 CFU/mL is used for a "clean-catch" mid stream sample, 10^4 CFU/mL is used for catheter-obtained specimens, and any number is used for suprapubic aspirations (a sample drawn directly from the bladder with a needle) [10]. The use of "urine bags" to collect samples is discouraged by the World Health Organization due to the high rate of contamination when cultured, and catheterization is preferred in those not toilet trained. Some, such as the American Academy of Pediatrics recommends renal ultrasound and

voiding cystourethrogram (watching a person's urethra and urinary bladder with real time x-rays while they urinate) in all children less than two years old who have had a urinary tract infection. However, because there is a lack of effective treatment if problems are found, others such as the National Institute for Health and Care Excellence only recommends routine imaging in those less than six months old or who have unusual findings [5].

The evidence that preventive antibiotics decrease urinary tract infections in children is poor. However recurrent UTIs are a rare cause of further kidney problems if there are no underlying abnormalities of the kidneys, resulting in less than a third of a percent (0.33%) of chronic kidney disease in adults.

Methodology

The study was conducted at Patna medical college and Hospital, Patna on total 73 patients who were attended Out-Patient Department (OPD) and who admitted in-patient department (IPD) from Jan to Dec 2017. All children aged 1 month to 10 years with a history of fever, clinical symptoms of UTI and positive urine culture with significant colony count were included in the study.

Following was the inclusion and exclusion criteria for the present study.

Inclusion Criteria

- Patients having clinical symptoms of UTI.
- Positive urine culture with significant colony count.

Exclusion Criteria

- Patients with pyuria and Urine culture negative.
- Children with positive urine cultures with suspected contamination.

Their demographic data and risk factors such as improper toilet training practices, history of (H/O) recurrent UTI, catheterisation/instrumentation, H/O previous surgery, H/O constipation, tight clothing and retention of urine, phimosis (male), labial adhesion (female), dehydration status, neurological deficits, palpable faecal mass, circumcision (male), postvoid dribbling, abnormal urinary stream, neurogenic bladder, ano-rectal malformation and myelomeningocele were noted.

Result & Discussion

The data from the 73 patients were collected and presented as follows. There are 43 boys and 30 girls were included in the study.

Table 1: Microorganisms isolated from urine culture

Microorganisms	Number of Cases
E. Coli	55
Enterococcus	9
Citrobacter	5
Candida	4

The major risk factors associated with febrile UTI are shown in Table 2.

Table 2: Major risk factors associated with febrile UTI

Factor	Number of Cases
Improper toilet training	52
Phimosis	14
Previous UTI	15
H/O instrumentation/ catheterisation	9
H/O constipation	5
Tight clothing	5
Structural anomalies	3

Other risk factors such as dehydration status, neurological deficits, palpable faecal masses, labial adhesions (female), circumcision (male), post void dribbling, abnormal urinary stream, neurogenic bladder, H/O previous surgery, ano-rectal malformation and myelomeningocele were insignificant in our study. Renal scars were detected only in 2 cases.

Table 3: Recurrent UTI, toilet training and structural anomalies in children

Risk Factor	Less than 1 year	1 to 5 years	6 to 10 years
Recurrent UTI	3	5	7
Proper toilet training	1	3	7
Structural anomalies	1	1	1

In the Mingin *et al*. study [6], none of the boys and girls younger than 1 year old, all 7 (100%) of the 2 to 5 year old boys, 14 (82%) of the 17 girls 2 to 5 years old and all 12 (100%) of the girls older than 5 years were toilet trained at the time of the initial infection.

Most of the parents were unaware of toilet training and its importance due to their low level of education. Similar to Mingin *et al*. study, in our study about 83% and 58% were not toilet trained incase of 1-5 year and more than 5 year age groups respectively.

Toilet training helps children learn to completely empty their bladder, an ability that reduces the risk of infection [7]. Both the American Academy of Paediatrics and the Canadian Paediatric Society's recommendations for toilet training suggest that children should not be forced into toilet training until they are behaviourally, emotionally and developmentally ready. The training should begin after 18 months of age using a potty-chair and parents should assess readiness signs that show child's interest in toilet training. A study was conducted in 2002 to evaluate the age at which potty training readiness signs were attained. It was found that girls started potty training at an average age of 23 months and boys at an average age of 25 months. The length of time to potty train two year olds ranged from 6.9-14.6 months [8]. Most children in western countries achieve bladder and bowel control between 24 and 48 months of age. Girls tend to achieve this control at a slightly younger age than boys [9].

Conclusion

Improper toilet training practices was the commonest risk factor associated with febrile UTI in children aged 1 month to 10 years in our study, occurring in 52 cases.

Reference

1. Urinary Tract Infection. CDC. Archived from the original

on 22 February 2016. Retrieved, 2015-2016.
2. Colgan R, Williams M, Johnson JR. Diagnosis and treatment of acutepyelonephritis in women". American Family Physician. 2011-09-01; 84(5):519-26. PMID 21888302.
3. Recurrent uncomplicated cystitis in women: allowing patients to self-initiate antibiotic therapy. Rev Prescire. 2013; 23(146):47-9.
4. Al-Achi, Antoine. An introduction to botanical medicines: history, science, uses, and dangers. Westport, Conn.: Praeger Publishers. ISBN 978-0-313-35009-2. Archived from the original on 2016-05-28, 2008, 126.
5. Bhat RG, Katy TA, Place FC. Pediatric urinary tract infections. Emergency medicine clinics of North America. 2011; 29(3):637-53.
6. Mingin GC, Hinds A, Nguyen HT, Baskin LS. Children with a febrile urinary tract infection and a negative radiologic workup: factors predictive of recurrence. Urology. 2004; 63(3):562-5.
7. Nijman JM, Butler R, Gool JV. Conservative management of urinary incontinence in Childhood Journal of Paediatric Urology, 2000, 513-51.
8. Potty Training Early. Available from: http://pottytrainingearly.com/pottytraining -resources.
9. Toilet learning: Anticipatory guidance with a child-oriented approach Paediatrics and Child Health. 2000; 5(6):333-5. PMid: 20177551 PMCid: PMC2819951.
10. Pankaj Hari, Srivastava RN. UTI, Pediatric Nephrology, 5th edition, 2011, 273-300.
11. Foxman B. The epidemiology of urinary tract infection. Nature Rev Urol. 2010; 7:653-660. [PubMed]
12. Chenoweth CE, Gould CV, Saint S. Diagnosis, management, and prevention of catheter-associated urinary tract infections. Infect Dis Clin North Am. 2014; 28:105-119. [PubMed]