April 2001

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Urinary Tract Infection (UTI) is one of the most common disorders seen in primary care. They do not occur as frequently in children as in adults.Clinical presentation of UT! in children may be nonspecific. Before age one UT! occurs more frequently in boys than girls[1] because of more structural abnormalities found in males. After age one, it is more common in girls because of short urethra and ascending infections[1]. During the reproductive age, male:female ratio is 1:50. After 50 years age the incidence in males and females, is almost equal M: F = 1: 1.5, because of increased frequency of prostate disease.

Clinical Presentation varies with age. Younger the age less localizing symptoms.

Neonates--Lethargic, hypotensive or septicemic Infants--Mostly non-sepecific like fever, failure to thrive, vomiting, anorexia, screaming episodes.

Pre-school age -- Again could be non-specific as unexplained vomiting, anorexia, failure to thrive or more specific like dysuria, frequency, fever, loin pain, and hematuria.

School going children and adults will present more with specific symptoms like dysuria, frequency, fever, vomiting, loin pain and haematuria.

Aetiology

The most common organism responsible for UTI is Escherichia coli, followed by Klebsiella, Enterobacter, Enterococcus, Staphylococcus aureus and Pseudomonas.

Urinary stasis is the most common pre-disposing factor for UTIs and can be caused by vesicoureteric reflux, bladder outflow obstruction and stones.

History and Examination

A full history regarding urinary habits including night bed wetting or the child has incomplete voiding, whether the child has damp or wet underwear during the day or does the child wait until the last minute to void or the child displays holding maneuvers like squatting or sitting on the heels[2,3], needs to be obtained.

Besides this, bowel habits should be asked whether the child has constipation or encoparesis[2,3]. Because this can cause urinary stasis which is the most pre-disposing factor for UTIs and can also cause incomplete voiding.

Moreover, past history of' urinary infection, vesico ureteric reflux, renal disease or hypertension is also important.

Examination should include palpation of bladder and kidneys, blood pressure, and looking at urine stream in boys. Genital area should be examined to exclude vulvovaginitis in girls or inflammation of the urethral orifice in boys.

Diagnosis

The urine analysis is the most important initial study in the evaluation of the patient suspected ofhavinga UTI.

In infants suprapubic aspiration or bladder catheterization in admitted patients and in older children, a clean-voided midstream specimen are essential for diagnosis of UT![4]. Use of adhesive perineal bags, to collect urine is suboptimal as bacteria from fecal contamination may be misinterpreted as UT! and 43% of bag samples taken from infants are reported to be falsely positive[5]. Validity of bag urines can be improved by cleaning the skin (but not with antiseptic), holding the child upright and removing the bag immediately urine is passed. Bag specimen may be used for screening.

All urine should be tested by dipsticks. If the urine sample is free from cloudiness or sediment and

negative for blood, protein, nitrite or leukocyte on testing with a dipstick, then a UTI is most unlikely. However, false negatives for nitrites can occur with enterococcal infection or in children under 2 years age.

A finding of more than 5 white blood cells per high power field in centrifuged fresh urine is a satisfactory positive screening test[6]. For confirmation of UT!, a properly obtained positive urine culture is essential.

Any number of colonies from a suprapubic bladder aspiration, more than 103 Colonies from an intermittent (in and out) catheterization and more than 105 Colonies from midstream clean-catch urine collection will indicate UT![7].

A urine culture is not mandatory in adolescent girls, particularly with a first episode. With recurrent episodes, episodes that fail therapy and in girls with pyuria without bacteriuria, a culture is recommended[8].

Recurrent UT! is defined as two or more UTIs over a six month period[9].

Treatment

Hospitalization is suggested for young infants (less than three months of age) and all children with clinical evidence of acute severe pyelonephritis (high fever, toxic appearance. severe flank pain)[10]. Patients with a less toxic appearance and uncomplicated UT! (no systemic signs of infection) can be managed in outpatients setting. Conventional therapy is for 10 days in children.

First line Choice for Oral Antibiotic Therapy

Nalidixic acid -- 55 mg/kg/day in three divided doses for 10 days Nitrofurantoin -- 5-8 mg/kg/day in four divided doses for 10 days Cefixime (cefspan)-10 mg/kg/day in two divided doses for 10 days For less than 3 months of age Nizarni et al in 1997 had reported that 85% of all organisms isolated from urine culture were resistant to ampicillin and septran[11]. Many other studies have supported this. Therefore these are not first line drugs to be used anymore.

Follow-up and Chemoprophylaxis

An urine culture should be obtained three to seven days after the completion of treatment to exclude relapse.

Prophylaxis is recommended for all children younger than 5 years of age with vesico ureteral reflux (who are not surgical candidates) or other structural abnormalities and in children who have had three documented UTis in one year[4].

Single nightly dose of Nitrofurantoin 1-2 mg/kg/day or Nalidixic acid 25-30 mg/kg/day may be used for 6 months or more[12] till reflux is controlled. Evaluated by doing m icturating cystourethrogram (MCUG) six monthly or annually.

Conclusion

Primary care physician should have a high index of suspicion for UT! in children. in any child with systemic signs of illness, treatment with parental antibiotics should be initiated and after clinical improvement, therapy should be switched to oral antibiotics for 10 to 14 days. in a febrile child with or without vomiting but no localizing signs, UTI should be excluded. UTI should be suspected, whenever there is unexplained fever, recurrent febrile episodes or persistent vomiting.

In all patients less than five years of age with no systemic signs and in boys over age five with no systemic signs, treatment with oral antibiotics should be carried out for 10 to 14 days. After that, diagnostic imaging with ultrasound and voiding cystourethrogram should be considered. in girls over five years of age with no systemic signs, treatment with oral antibiotics should be carried out for 7 to 10 days. Diagnostic imaging in these patients is not necessary with the first UTI but may be indicated in cases of recurrent UTI.

Indications for Referral
1) Any child with severe systemic signs or symptoms.
2) Recurrent UTIs.
3) Ultrasound showing renal scarring.
4) M icturating cystourethrogram detecting vesico ureteric reflux greater than grade Ill or with any other congenital anomalies.

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