

Review in Diagnosis and Treatment of Urinary Tract Infection in Children

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ABSTRACT : Urinary tract infection (UTI) are common serious infections in children. History and examination can be non-specific. Urine example required for diagnosis. Collect urine correctly -dipstick test are useful for screening bedside urine culture for diagnostic contamination. To select appropriate antibiotics for treatment must be subject to tests due to increasing resistance of bacteria to antibiotics. Some children with anatomical abnormalities in the urinary tract need surgery to correct them. Other children, however, need to take antibiotics daily to prevent infection. Children with VUR often need surgery to correct this and take antibiotics pending surgery. Children with less severe VUR are watched closely, and they may be prescribed antibiotics. Certain mild to moderate cases of VUR can resolve on their own without treatment. Urine infection spreads in children of all ages, and the matter is often delayed quickly, due to the mother's lack of awareness of this problem, and her lack of knowledge of its symptoms, so get acquainted with us today about the symptoms, causes and treatment of urine infection in children.

Keywords: urinary, infection, children

I.INTRODUCTION

Urinary tract infection important and common diseases, with 2 percent of boys and 8 percent of girls having at least one episode by seven years of age¹. UTI prevalence varies with child's age, and it is more common in uncircumcised males infants, in female due to short female urethral distance, and foreskin surface area in uncircumcised males². Some underlying aetiology, including renal diseases and renal scarring, hypertension, toxemia and chronic renal failure can cause considerable morbidity later in life³.

Aetiology:

Abnormalities of urogenital tract reported in 3.2 percent of healthy screen infants. Most UTIs are caused by gram negative bacteria which arising from faecal flora colonies the perineum, enter and ascend the urinary tract⁴. *E.coli* accounting 85 percent of UTIs children, which attach on uroepithelial cells surface by their fimbriae then overcome host defenses, other common pathogens such as *Klebsiella*, *proteus*, *Enterobacter*, *citrobacter*, *staphylococcus saprophyticus* and *Enterococcus*⁵.

Lower and upper tract UTI:

UTI can be classified anatomically to lower UTI and upper UTI⁶ (Figure1), lower UTI include infection the urethra and bladder with symptoms such as suprapubic or lower abdominal pain, urinary frequency dysuria and urgency, upper tract UTI include inflammation and infection the kidneys (pyelonephritis) and ureters this leads to loin tenderness and abdominal pain, fever vomiting anorexia, lethargy and malaise. In younger children, these signs are often absent, and different between lower and upper UTI⁷, figure (1).

DIAGNOSIS:

History, Clinical symptoms and signs of UTI depend on the child's age. Younger children can report symptoms such as abdominal pain or dysuria. Parents must notice non specific signs, such as irritability, lethargy vomiting and poor feeding. These symptoms may overlap with viral infection as well as bacterial infection. Older children many have signs and symptoms similar to adults^{8,24}. Clinical diagnosis of urinary tract infection is unreliable, therefore, many children with symptoms of UTI such as fever need to urine sample to make or exclude the diagnosis. The urine sample should collect before starting antibiotic course, but the therapy must be not delayed in the septic child. Children with signs UTI need a urine sample to confirm the diagnosis⁹.

Urine collection:

midstream urine (MSU) should be collected in the sterile collection jar, (Figure2), cleaning with water and soap

before midstream urine further to reduce contamination¹⁰. In younger children other methods use to collect urine sample include the nappy pad bag or clean catch to the urine stream¹¹. other method to extract urine from bladder by suprapubic needle aspiration or catheterization (figure3), these methods are more appropriate for culture urine and diagnosis¹². Some children with alternative focus of illness don't need to urine sample¹³ exceptions children at risk complication (single kidney), predisposing conditions (renal anomalies) and fibrole illness not following clinical courses., figures (2,3).

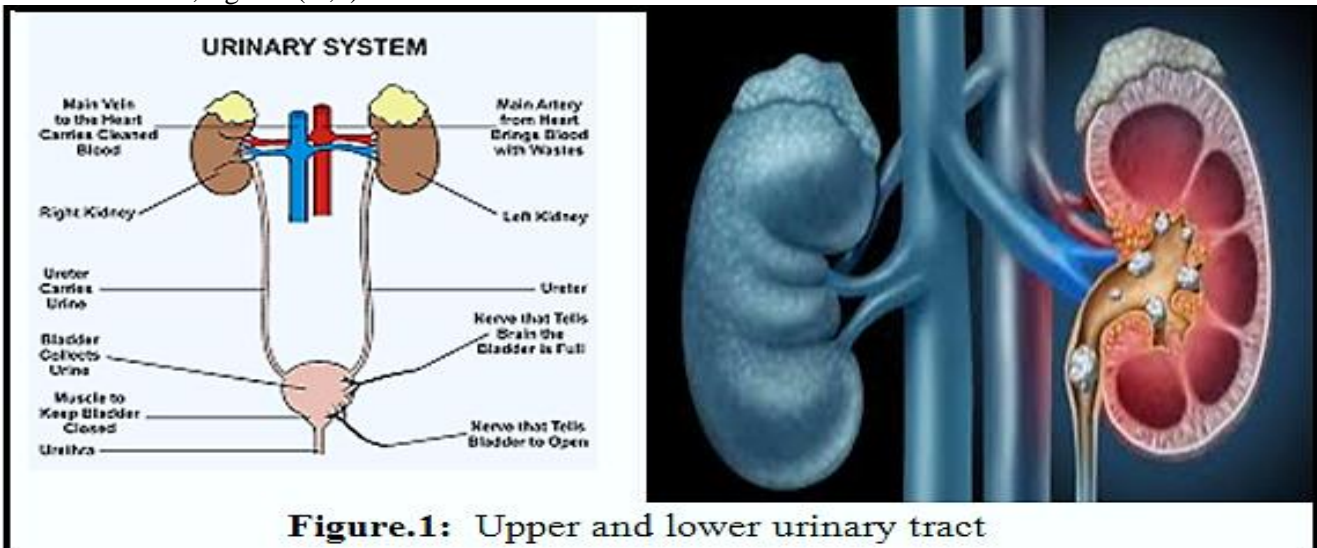


Figure.1: Upper and lower urinary tract

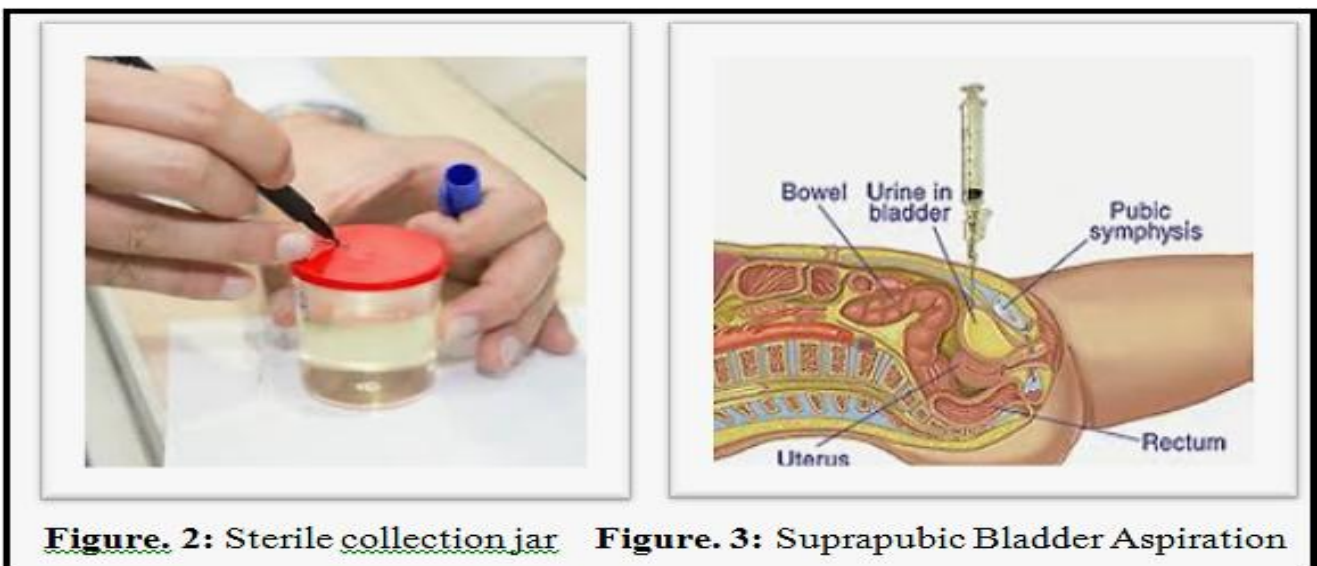


Figure. 2: Sterile collection jar

Figure. 3: Suprapubic Bladder Aspiration

Screening a dipstick and microscopic Examination: Urine dipstick inexpensive, quick and bedside screening tools. When color of chemical reagent strips is change that mean present of leucocytes esterase and nitrites which arise from urinary tract infection¹⁴, when dipstick has negative value the diagnosis should excluded¹⁵ (Figure4) . Microscopic examination of urine also identifies bacteria and leucocytes(Figure5) augmenting dipstick Screening., figures (4, 5).

Culture :Urine culture in the laboratory is standard mothed to diagnosis UTI. Urine must be sterile, so presence of bacteria with evidence of active infection, suggest urinary tract infection. Urine expected to be infected added to growth media, then cultured in 37C for 24 hours, then presumptive diagnosis reviewed For diagnosis UTI.Culture is required¹⁶.Recent studies suggest that even lower 10.000 CFU/ml threshold increase sensitivity without reducing diagnosis specificity¹⁷. Present bacteria in the urine without active infection is Asymptomatic bacteria (ASB), this case prevalence at 1.4% - 1.9% in children¹⁸. Growth of bacteria without evidence of infection (such as pyuria) doesn't suggest UTI .Some colonies of bacteria growth in the culture may contamination, early infection or ASB , pyuria absent in the early the early infection or immune compromised screen. Culture and screen must be Considered in a clinical contex⁷. Urinary calculi dysfunctional eliminations, urethritis and diabetes

mellitus most considered in children with urinary tract infection.

TREATMENT :

Amoxicillin was the first line antibiotic for UTI, but increase the resistance of bacteria to this antibiotic made it a less acceptable choice. Many studies were found other choices to treatment such as, Amoxicillin clavulanate Cephalosporins, such as cephalexin, cefixime, cefprozil and Cephalexin. According to antibiotic sensitivity test, physician prescribes treatment¹⁹. (Figure 6) lists commonly antibiotics with dosing information which used to treat UTI in children.

Duration of 2-4 days course oral antibiotics effective as 7-14 day course in children with lower urinary tract infection because there is no significant difference between short and standard duration treatment in the organism, which develop resistance at the end of treatment²⁰. Single day or single dose are less effective than long course of oral antibiotics. However, delaying antibiotics by 4 days or more may increase the risk of renal scarring²¹. Fluoroquinolone therapy is limiting to the patient with UTI caused by *Pseudomonas aeruginosa* or other multiple resistant bacteria²². Duration of intravenous therapy 10-14 days in children with Pyelonephritis is typical²³. Sometime must referred to subspecialist renal scarring, Vesicoureteral reflux, anatomic abnormalities or renal calculi are discovered., figure (6).



Figure.4: Dipstick screen

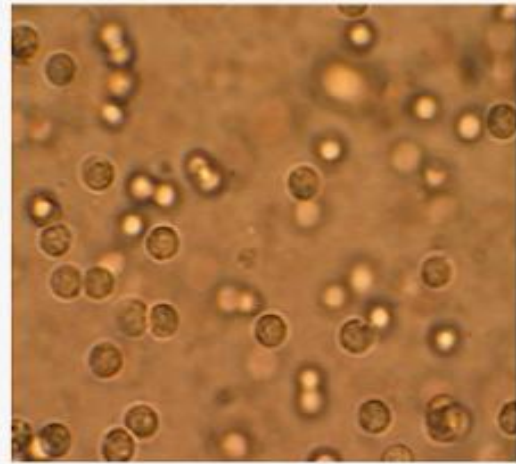


Figure.5: Microscopic examination

Antibiotic	Dosing	Common adverse effects
Amoxicillin/clavulanate (Augmentin)	25 to 45 mg per kg per day, divided every 12 hours	Diarrhea, nausea/vomiting, rash
Cefixime (Suprax)	8 mg per kg every 24 hours or divided every 12 hours	Abdominal pain, diarrhea, flatulence, rash
Cefpodoxime	10 mg per kg per day, divided every 12 hours	Abdominal pain, diarrhea, nausea, rash
Cefprozil (Cefzil)	30 mg per kg per day, divided every 12 hours	Abdominal pain, diarrhea, elevated results on liver function tests, nausea
Cephalexin (Keflex)	25 to 50 mg per kg per day, divided every 6 to 12 hours	Diarrhea, headache, nausea/vomiting, rash
Trimethoprim/sulfamethoxazole (Bactrim, Septra)	8 to 10 mg per kg per day, divided every 12 hours	Diarrhea, nausea/vomiting, photosensitivity, rash

Figure .6 : Lists commonly antibiotics with dosing information which used to treat UTI in children Information from reference²⁴

Complications of a urinary tract infection in children: Sepsis is the spread of germs throughout the urinary tract or

transmission to another organ, which makes the infection severe. Bacteria, which means the spread of germs in the blood. Infections or ulcers in the kidneys. Chronic kidney failure. These infections occur due to the presence of some germs or bacteria, figure (7), and sometimes due to the formation of stones in one of these urinary tracts, and if neither of the two problems is treated, temporary or chronic kidney failure may occur, depending on the case. Females suffer from children more than males from this problem until the age of twelve, to equalize the ratio of the sexes in the incidence after that²⁵, figure (7).

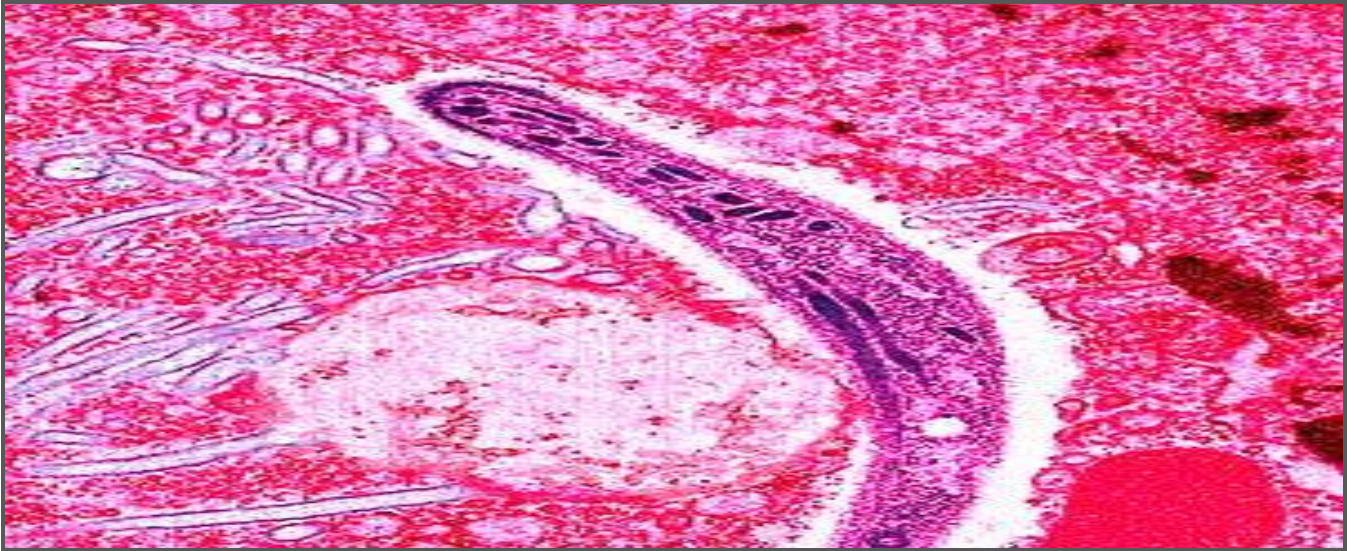


Fig. 7 : Infection of Tissue

Treatment through Surgery:

Urinary tract infection is treated with antibiotics. It is given to children who appear severely ill or whose initial tests show they have a urinary tract infection, before the culture of the culture test results. Otherwise, the doctor will wait for the results of the culture test to appear to confirm or deny the diagnosis of a UTI. Antibiotics are given by injection (intramuscularly or intravenously) to all severely ill babies and all newborns. Whereas, antibiotics are given by mouth to the rest of the children²⁷⁻³². The treatment lasts 7-14 days. Children who need more tests to check for anatomical abnormalities in the urinary tract often continue to take antibiotics until the tests are complete and results are available²⁶.

Hematological Tests

Blood tests and tests that detect inflammation (C-reactive protein and erythrocyte sedimentation velocity test) help when urine tests do not confirm a diagnosis, and may be used to help the doctor diagnose a kidney infection as well as a bladder infection. A bacterial culture of a blood sample is used in infants with a urinary tract infection, and in toddlers between the ages of (1-2) years³³⁻³⁸ and very ill.

Urine Tests:

The doctor diagnoses a urinary tract infection by examining the urine (urinalysis) and sends a sample for bacterial culture and checks for any bacteria present in it. A toilet trained child can use a sterile container to collect a sample of urine in it. In this method, the opening of the urethra is first cleaned with a small dressing impregnated with a sterile substance. Then the child passes a small amount of urine into the toilet to flush the urethra³⁹⁻⁴³. Then the child stops urinating in the toilet and continues to urinate into the sterile container. For younger children and infants, urine is taken from them by inserting a sterile, thin, flexible tube through the opening of the urethra into the bladder. This process is called catheterization⁴⁴.

RECOMENDATIOM:

- 1- When symptoms appear on the child, he must be shown to the doctor immediately for the purpose of diagnosis.
- 2- After diagnosis, follow the instructions in describing large quantities of vital doses..
- 3- Ask the child if he feels any pain when urinating.
- 4- Ask the child to drink large quantities of water and avoid allowing him to drink soft drinks, tea, tea, tea or drinks, he gets the care of the body and the moisture that you eat on insomnia.

- 5- With regard to activities, make sure to change your child's diaper to keep his urinary tract clean.
 - 6- For older children who use the bathroom alone, be sure to educate them about proper hygiene rules and habits. For example, girls should be taught to always clean themselves from the front to the back so that bacteria do not pass into the urinary tract.
 - 7- Choose cotton underwear and avoid synthetic materials that hinder the sweating process.
- In conclusion, the site pointed out that although infections that affect the urinary tract are usually minor and can be easily treated with antibiotics, you should consult a pediatrician to get the best advice for the health of your children.

II. CONCLUSIONS

Treatment of urinary tract infection in children Treatment is done with some antibiotics, the type and dose of which the doctor determines according to the child's age and condition. Infants are often given antibiotics as an infusion into a vein, while older infants can be given antibiotics in liquid, drops, or pills for older children. If he finds out in a timely manner, the doctor will order a urine test and urine culture analysis for older children as long as they are able to control urination, and for infants, the doctor extracts urine through a catheter from the bladder, and one of the most common signs of infection is the appearance of white blood cells in the urine.

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