Times UTASH To Tin UtaSH SUYASH SUYASH

A Quarterly News Letter From Suyash Nursing Home July 2015 - 8th Issue

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Previous Issues of Suyash Uro Times are available at www.suyashurology.com

Preface

I consider it my honor to write this preface for 8th issue of Suyash Uro times. It is always easy to start any activity but to keep it sustained is most difficult job. Dr Sharad Somani and his team deserve special congratulations for keeping consistency in publication and maintaining standard of the scientific articles published in all issues.

In this issues Dr Pankaj Bhansali and Dr Ravindra Bhattu have covered important topic of urinary tract infections in children and adults. This will be useful for busy consultants to get updated with latest developments in management of UTI in practice.

I wish that Dr Sharad Somani and his team will overcome the difficulties in keeping this publication getting published regularly and maintain it's scientific standard at par with indexed journals.



DR SUDHIR KULKARNI (MD, DM Nephrology) Professor & Head Department of Nephrology MGM Medical College, Aurangabad.

From Editors Desk

Dear colleagues,

Warm greetings from team "Suyash Uro Times"

It is my immense pleasure to publish 8th issue of the newsletter.

We started this activity as a continuous medical education. I am happy to inform you that we are getting overwhelming response from the doctors all over. General practitioners, specialists & super specialists have communicated personally and appreciated the activity.

This issue highlights most common and basic urological illness of Urinary tract infection in children and adults. The articles are written by the masters in the field and will be definitely of benefit for the practitioners to follow the guidelines.

Please feel free to write to us on <u>suyashnursinghome@gmail.com</u> regarding suggestions, advice or criticism so as to make us improve on the scientific stuff.

Looking forward to communicate with you time to time through this newsletter.

Dr. Sharad Somani

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URINARY TRACT INFECTION IN CHILDREN

Dr Pankaj Bhansali

Urinary tract infection is common bacterial infection in children affecting 3-8% of girls and 1-3% of boys before 14 years of age. Urinary symptoms are often minimal and nonspecific in young children. It is important to suspect, diagnose and treat urine infection at early stage. It will help in preventing renal scarring and its long term consequences like hypertension, chronic kidney disease and pregnancy induced hypertension in female.

Definitions

UTI is growth of significant number of organisms of single species in the presence of symptoms. Number of organisms required to be present to diagnose urine infection depend on the site of collection. The significant bacteriuria is defined as colony count of $>10^5/mL$ of a single species in a midstream clean catch sample while presence of single pathogen is considered significant from suprapubic aspirate.

The distinction between upper and lower UTI is difficult and not necessary. In view of risks of renal parenchymal damage associated with delayed treatment, UTI in children is considered to involve the upper tract and should be treated promptly. Patients with features of systemic toxicity are considered as having complicated UTI while those without these features are referred to as simple UTI. This distinction is important.

Table I distinction between complicated and simple UTI

Complicated UTI	Simple UTI
High grade fever >39 C Sick looking child Persistent vomiting, dehydration Renal angle tenderness Elevated creatinine	Low grade fever Dysuria, urgency, frequency Absence of features of complicated UTI

Clinical Features

UTI is an important cause for fever without a focus, especially in children less than 2 years old. In neonates, UTI is usually a part of septicemia

Table II Clinical features

Age group	Features
Neonate	Sepsis, Vomiting, lethargy, Jaundice, Seizure
Infant and young children	Recurrent fever, Fever without focus Diarrhea, vomiting, abdominal pain Poor weight gain, Failure to thrive
Older children	Fever, Dysuria, urgency, frequency Abdominal or flank pain, Secondary enuresis

Diagnosis

While urine analysis enables a provisional diagnosis of UTI, a specimen must be obtained for culture prior to therapy with antibiotics. The diagnosis of UTI is based on positive culture of a properly collected specimen of urine.

Significant pyuria is defined as >5 leucocytes per high power field in a centrifuged sample. Presence of leucocytes in

absence of significant bacteriuria is not sufficient to diagnose UTI. Leucocyturia might occur in conditions such as fever, glomerulonephritis, renal stones or presence of foreign body in the urinary tract. Availability of dipstick has made screening for UTI very easy. It uses leucocyte esterase and nitrite test with good sensitivity and high negative predictive value. It is diagnostically as useful as microscopy.

Urine collection for culture

A clean-catch midstream specimen is preferred method. Genitalia should be washed with soap and water by separating labia in girls and gently retracting prepuce in boys. It is not advised to use antiseptic solution. suprapubic aspiration or transurethral bladder catheterization can be used in neonates and infants. If done under aseptic precautions both are safe procedures. It is not recommended to use urine bag sample for culture due to high false positive rates.

The urine specimen should be promptly plated within one hour of collection. If delay is anticipated the sample can be stored in a refrigerator at 4°C for up to 8-12 hours.

Table III Diagnosis of significant Bacteriuria

Method of collection	Colony count	Probability of infection
Suprapubic aspiration	Any number of pathogens	99%
Urethral catheterization	$>5 \times 10^4$ CFU/mL	95%
Midstream clean catch	>10 ⁵ CFU/mL	90 - 95%

Assessment

The child should be evaluated for the degree of toxicity (sick look, vomiting, high grade fever, and dehydration), blood pressure, and bowel and bladder habits. The child should be assessed for underlying urological or neurological abnormalities. Complete blood counts, serum creatinine and a blood culture should be done in infants and children with complicated UTI.

Table IV Features Suggesting Underlying Structural Abnormality

Distended bladder
Palpable, enlarged kidneys
Tight phimosis; vulval synechiae
Palpable fecal mass in the colon
Patulous anus; neurological deficit in lower limbs
Urinary incontinence
Previous surgery of the urinary tract, anorectal malformation
or meningomyelocele



External markers for spinal dysraphism

Treatment

The child's age and degree of toxicity help in deciding the need for hospitalization. But therapy should be initiated immediately to reduce risk of renal scarring.

Table V

Age and toxicity	Antibiotics	Duration
Neonate	Injectable antibiotics	10 - 14 days
Infant less than 3 months Or Complicated UTI	Injectable for 3 days followed by oral	10 - 14 days
Children more than 3 months and simple UTI	Oral antibiotics	7 - 10 days
Adolescent with cystitis	Oral antibiotics	3 - 5 days

Antimicrobials for UTI

Injectable

Cefriaxone, Cefotaxime, Gentamicic, Amikacin, Coamoxiclave Oral antibiotics

Cefixime, Cefodoxime, Coamoxiclav, Cotrimixasole, Ofloxacin, Ciprofloxacin

Other therapies

Fever should be controlled with paracetamol. Use of other non-steroidal anti-inflammatory drugs should be avoided. Child should be well hydrated. Alkalanization of urine may not be necessary as routinely. There is no need to repeat urine culture if child has symptomatically relieved. If fever does not resolve in 72 hours we may repeat urine culture.

Investigations after first UTI

Management of UTI does not stop at treatment of episode of UTI. Every child with even first episode of UTI is potentially at risk of renal scarring. It is particularly high in infancy and in child with vesicoureteral reflux. Every child shall undergo ultrasonography. Intravenous Pyelogram is rarely required in treatment of UTI.

Chart I. Investigations after first UTI



Every pregnancy does not get antenatal anomaly scan and many times diagnosis of UTI is missed or delayed. So it is recommended to undergo radiological evaluation for every child with even first episode of UTI.

Table VI Investigations

Investigation	Timing	To look for
USG	During treatment	Hydronephrosis, hydroureter, bladder capacity and wall thickness, post - void residue
MCU	After 2 weeks	VUR, dilated post urethra, bladder contour, post void residue
DMSA	After 3 months	Renal scar, differential function
Radionulclide VCUG	Follow - up	To look for resolution in case of diagnosed VUR(as less radiation exposure)

Prevention of recurrent UTI

- Hygiene of perineal area
- Plenty of fluid intake
- Use of cotton undergarments
- Proper bladder training and timed voiding
- Circumcision in child with high grade reflux with recurrent UTI, or solitary kidney
- Treat constipation
- Treat worm infestation

Antibiotic prophylaxis

Prolonged course of low dose antibiotics can be used to prevent recurrent febrile UTI. It is recommended for children less than 1 year awaiting investigations, mild grade VUR till 1 year, moderate to high grade VUR till 5 years, frequent febrile UTI. The drugs commonly used are amoxycilline, cephalexin (till 6 months), cotrimoxazole, nitrofurantoin(after 3 months). It should be given as single night dose daily. It is not recommended for children with obstructive kidney disease, urolithiasis. There is no role of cyclic changes in prophylaxis.

Bowel bladder dysfunction

It is an abnormal pattern of micturition in presence of intact neuronal pathways without congenital or anatomical abnormalities. Abnormal bladder pressure and urinary stasis predispose these children to recurrent UTI. Many of times constipation is also associated with it so termed as bowel bladder dysfunction. It might be a risk factor for recurrent UTI and or persistent VUR.

Table VII Features Suggestive of Bowel Bladder Dysfunction

Recurrent urinary tract infections
Persistent high grade vesicoureteric reflux
Constipation, impacted stools
Maneuvers to postpone voiding (holding maneuvers, e.g., Vincent curtsy, squatting)
Voiding less than 3 or more than 8 times a day
Straining or poor urinary stream
Thickened bladder wall >2 mm
Post void residue >20 mL

Evaluation for a voiding disorder includes a record of frequency and voided volume and fluid intake for two to three days. It is useful to watch the urinary stream, and for post void dribbling in boys. Urodynamic studies are done in selected cases. The management of voiding disorders should be carried out in collaboration with an expert. This includes the exclusion of neurological causes, institution of structured voiding patterns and management of constipation. In patients with an overactive bladder, therapy with anticholinergic medications (e.g. oxybutinin) is effective. Patients with bowel bladder dysfunction and large post void residues, benefit from timely voiding, bladder retraining and clean intermittent catheterization.

Vesico-Ureteral Reflux

VUR is seen 30-40% children with UTI. It is graded using from grade I to V, based on the appearance of the urinary tract on MCU. Lower grades of reflux (grade I-III) are more likely to resolve. Secondary VUR is often related to bladder outflow obstruction, as with posterior urethral valves, neurogenic bladder or a functional voiding disorder.



Grades of Vesico-Ureteral Reflux

The presence of moderate to severe VUR, particularly if bilateral, is an important risk factor for pyelonephritis and renal scarring, with subsequent risk of hypertension, albuminuria and progressive kidney disease. Scarring is maximally seen in UTI in first year of life. The presence of intrauterine VUR has been associated with renal hypoplasia or dysplasia. Conventional therapy for VUR includes antibiotic prophylaxis and surgical intervention. Recent analysis concluded that the outcomes following surgical repair versus prophylaxis were similar in terms of the number of breakthrough UTI and risk of renal scarring. The management of patients with VUR should depend on the patient age, grade of reflux and any breakthrough infection.

For **mild grade VUR**, initially child should be started on antibiotic prophylaxis. Almost 70-80% of mild grades VUR resolve with age. After 1 year of age, antibiotic prophylaxis may be discontinued. But these children should be followed up for occurrence of UTI. They may not need further evaluation unless they develop breakthrough UTI.

For **grade III-V VUR**, child should be kept on antibiotic prophylaxis for 5 years. After 5 years of age prophylaxis may be discontinued, even if mild grade VUR persists, as risk of scarring is low. Repeat imaging may be done after 18-24 months. Radionuclide cystogram is preferred mode for follow up with lower radiation. In children with bowel bladder dysfunction prophylaxis may be continued.

Table VIII Indications of Surgical repair

Care

Mild grade VUR	Solitary kidney with scar
Grade III-V VUR	Breakthrough UTI New scars on DMSA Deterioration in renal function Parents preference

Endoscopic treatment with Deflux injection has shown satisfactory result in experienced hand in mild to moderated grade VUR. A detailed evaluation for voiding dysfunction should be done before planning surgical repair.

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URINARY TRACT INFECTION IN ADULTS Dr Ravindra V. Bhattu

Urinary Tract Infections (UTI's) are some of most common infections seen in humans only next to respiratory and gastrointestinal infections.

- Bacterial infections of the urinary tract are the most common cause of both community acquired as well as hospital acquired infections.
- Although UTI's are thought to be easy to detect and cure a number of factors must be taken into account to provide the most appropriate and effective care.
- Recommendations on the diagnosis and treatment of this common infection vary according to patient's age and sex as well as co-morbidity, risk of infection with resistant pathogens, previous response to therapy, presence of urinary catheter and pregnancy.
- The choice of antibacterials has increased, as has the prevalence of resistant pathogens.
- Let us review some important definitions
- Significant bacteriuria is defined as presence of 10⁵ CFU (Colony forming units) of bacteria/ml of urine.
- Upper v/s Lower urinary tract infection : when infection is limited to lower urinary tract i.e. bladder and urethra it is called lower UTI and when it involves kidney & ureters - it is called Pyelonephritis or upper UTI
- 3) Complicated UTI: is said to be complicated when it is associated with one or more of following conditions that increases the risk of failing therapy. a) Diabetes b) Pregnancy c) Symptoms for 07 or more days before seeking care d) Hospital acquired infection, renal failure. e) Urinary tract obstruction f) Presence of indwelling catheter, stent or Nephrostomy tube or urinary diversion g) Functional or anatomic abnormality of urinary tract h) Renal Transplantation I) Immnusupression
- Asymptomatic bacteriuia (ABU) : It is defined as isolation of specified quantitative count of bacteria in an appropriately collected urine specimen from an individual without symptoms or signs of UTI
- 5) Recurrent UTI: It is defined as 2 uncomplicated infection within 06 months or 03 or more infections within year Risk Factor: Except among infants and elderly, UTI is far more common in females than in males.
- The risk factors for UTI in females are shorter length of urethra, frequent sexual intercourse, proximity of vagina to urethra. Other risk factors in women include recent use of spermicidal, new sexual partner, recent history of UTI, diabetes and incontinence.
- In men UTI is more common in neonatal period because of higher frequency of congenital urinary tract abnormalities.
- In men above 50 years of age prostate hypertrophy is a major risk factor and in younger men with UTI anatomical abnormality of urinary tract needs to be ruled out.
- Last but not the least Diabetes poses a major risk for development of UTI in both sexes

Etiology : In various studies, following bacteria have been found to cause UTI :

- 1) E. Coli responsible for 75-90% episodes
- 2) Staph Saprophyticus 5-15%
- Klebsiella, Proteus, Enterococcus, citrobacter & other SP
 5-10% additionally Acinetobacter, Morgenella &
 Pesudomonas are associated with complicated UTI's

Clinical Presentation : Depends on the anatomical location of UTI

Cystitis : Typical symptoms are dysuria, urinary frequency and urgency.

Less commonly it can present as Nocturia, hesitancy suprapubic discomfort & gross hematuria. Fever is seen only with upper urinary tract infection.

Pyelonephritis:

It can present as fever, rigors, nausea, vomiting and flank and or loin pain. Symptoms are usually acute in onset and typical symptoms of cystitis may or may not be present.

Prostatitis:

Acute bacterial prostatitis presents with dysuria frequency & pain in prostatic, pelvic or perineal area, fever with chills & obstructive urinary symptoms. Chronic bacterial prostatitis can present with recurrent episode of cystitis

Diagnosis:

- Urine analysis and urine culture along with imaging of the kidney form the mainstay for diagnosis
- Women with uncomplicated cystitis with peculiar history may not require any investigations and may be treated empirically
- All men with UTI as well as women with complicated UTI as well as suspected pyelonephritis should be investigated for confirmation of diagnosis as well as treatment planning

Urine analysis : Dipstick urine analysis has 02 specific tests to indicate presence of infections.

- 1) Leukocytes esterase test for enzyme present in WBC which is indirect evidence of presence of Neutrophil in urine.
- 2) Nitrites: Surrogate marker for bacteriuria. Frequently urine samples from patients within UTI are turbid with blood as well as albumin positives.

M/E may reveal presence of pus cells along with bacteria, microscopic haematuria could also occur.

Urine Culture:

Should be performed in all men with UTI and all women with acute pyelonephritis as well as complicated UTI. Proper sample collection with clean catch midstream technique and after proper cleanup genitalia is must to prevent contamination and false positive results. Use of bactec technology with incubators can improve the yield of samples.

Imaging:

- 1) USG is easily available highly sensitive and cost effective modality for evaluation. All men & women with complicated UTI should undergo USG exam to look for structural abnormalities of urinary tract
- 2) X-Ray KUB and CT scan are useful in evaluating renal stone disease. CT scan can also diagnose emphysematous UTI which is characterized by presence of air foci.
- 3) Rarely urodyanamic studies, VUR study, MCU studies as well as DTPA/DMSA scans might be required to rule out specific urinary tract abnormalities.

Treatment:

- 1) Community acquired uncomplicated cystitis in women can be treated with empirical first line antibiotics like
- a) Nitrofurantion 100mg Bid for 5-7days
- b) Tab. CO-trimoxazole 01 Bid for 03 days
- c) Fluroquinoloues like Tab. Levoflaxacin for 03 days

Uncomplicated Pyelonephritis can be managed on outpatient basis (OPD). Persistent fever, Hypotension, Hypovolumia and inability to tolerate antibiotics are indications for hospitalization and IV antibiotic therapy. 1st and 2nd generation, Cephalosporin as well as injectable quinolones can be used empirically depending upon local culture sensitivity patterns. IV fluids along with close monitoring for symptoms along with evaluation to diagnose complicated UTI are the mainstay of treatment

Complicated UTI:

Approach to treatment of complicated UTI is different. It starts with aggressive evaluation along with use of higher antibiotics like 4th generation Cephalosporin, Carbapenems depending upon the severity of Sepsis syndrome.

Control of Diabetic status, judicious use of dialysis support and relief of obstructive uropathy are important.

UTI in special situations:

Pregnancy: Pregnant women are at higher risk of severe UTI because of pregnancy related anatomical as well as physiological changes. Urine culture should be performed in all these patients. Hospitalization should be done in presence of pyelonephritis to treat with IV antibiotics

Kidney Transplant Recipients : UTI occurs in 30-40% Post Transplant Recipients in first 03 months. It can present with graft dysfunction. It should aggressively treated with 4th generation Cephalosporin or Carbapenems

Recurrent UTI:

Recurrent UTI can be managed with prophylactic use of antibiotics such as quinolones, Tab. CO-trimoxazole or 1st & 2nd generation Cephalosporin for 3-6 months

Practicing personal hygiene, frequent voiding and avoiding spermicidal are few ways to prevent UTI's

CAUTI:

Catheter associated UTI is most commonly observed hospital acquired infection. Practicing proper aseptic technique of catheterization (treating it as a procedure), catheter care by trained nurses, monitoring for signs & symptoms of UTI, removal of catheters at the earliest and treatment with appropriate antibiotics are the key measures in managing CAUTI.



Presentation on "Imaging in stone disease" at Uro Pad 2015, Dhule



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