

Urinary Tract Infections in Children

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Urinary Tract Infections in Children

- Common
- 1% of boys & 5 % of all girls are likely to get a UTI at some stage
- UTI : often missed or over diagnosed
- Prognosis for childhood UTI is good
- Low long-term risks

Epidemiology

- UTI > frequent in first 2 years of life
- In neonates > common in boys
- > 6 months of age and throughout childhood > common in girls

Etiology

- \pm 90 % of uncomplicated first UTI due to E coli
- With abnormal urogenital tract other organisms > common

Pathogenesis

- Haematogenous spread > neonates
- Ascending infections > infants & in girls

Pathophysiology of UTI

Reflects a complex interaction between virulence factors of the micro organisms and the host defense

Predisposing Factors

- Virulence of bacteria
 - Exposed to nosocomial organisms
- Age and sex
- Functional abnormalities
- Anatomical abnormalities
- Individual susceptibility

Pathogenesis of ascending infections

- After birth peri-urethral area & distal urethra are colonised by bacteria which normally reside in GIT
- → Act as defense barrier against pathogenic bacteria
- Normal flora is disturbed
 - Colonisation with pathogenic organisms (non maternal origin) in hospitalised babies
 - Broad spectrum antibiotic treatment of other infections

Pathogenesis of ascending infections

- To cause UTI uropathogens must
 - Gain access to the bladder
 - Proliferate
- Normal voiding →± complete washout of bacteria
- Proliferation of bacteria is possible with
 - Voiding dysfunction –
 - e.g. detrusor instability / holding maneuvers
 - Poor bladder emptying

Predisposing factors

Sex

- UTI's > common in girls due to short urethra
- In first 3 months uncircumcised boys have 10 x > UTI compared to circumcised males

Anatomical abnormalities

- Vesico-ureteric reflux

Individual susceptibility

Symptoms and signs

- **Neonates and infants**
 - Non specific
 - Feeding problems
 - Poor weight gain
 - Prolonged jaundice
 - Ill appearance / septicaemia

Strong predictors of UTI in

- **Neonates and infants**
 - Fever > 38.5 °C
 - Persistence of fever >24 hours
 - Uncircumcised male
 - Female sex
 - Absence of another cause for the fever

Symptoms & signs in infants and toddlers

- Unexplained or prolonged fever
- Poor appetite or poor growth
- Irritability
- Abdominal pain
- Enuresis or urinary retention

Symptoms & signs in children > 6 years

- Fever and rigors
- Symptoms more specific
- Dysuria and urgency
- Frequency
- Enuresis
- Headache and anorexia

Clinical features of UTI in association with an abnormal urinary tract

- Poor weight gain
- Dehydration and metabolic acidosis
- Hypertension
- Palpable kidneys and bladder
- Poor urinary stream
- Urinary incontinence

In any child with PUO, examine the urine

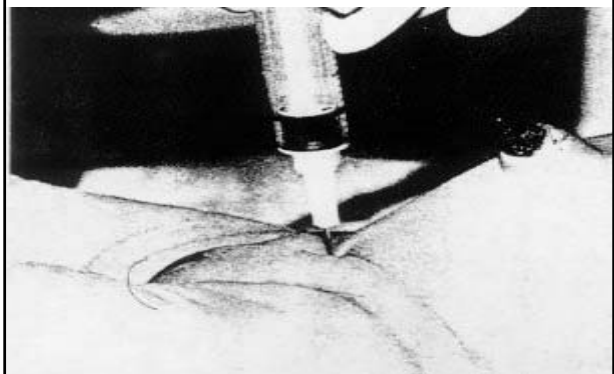
Urine collection

- Bags for screening test only
- Suprapubic aspiration in acutely ill infants
- Catheter urine sample
- Mid stream clean catch

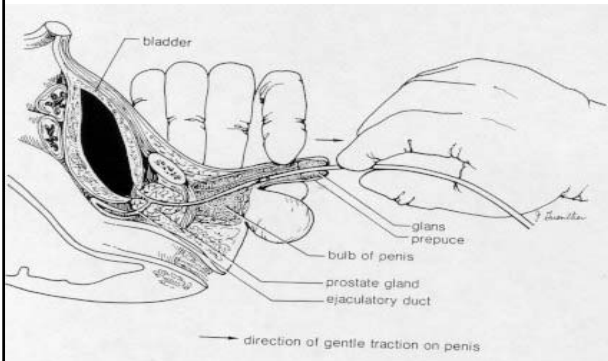
Urine collection with bag



SUPRAPUBIC URINE ASPIRATION



Catheterization of the bladder



Treatment

- Neonates & infants < 3 months
 - Parenteral antibiotics for septicaemia
 - 2nd or 3rd generation cephalosporin
 - β lactam antibiotic plus aminoglycoside
 - Change antibiotic according to sensitivity of organism

Treatment for infants < 3 months old

- Use correct dosage
- Monitor trough levels if applicable
- Once patient is afebrile and improving \rightarrow switch to oral antibiotics
- Treat for total of 10 days (septicaemia)
- Follow up culture mandatory

Treatment of older children

- Acutely ill: IV antibiotics e.g. 2nd / 3rd generation cephalosporin
- Less ill: oral amoxicillin-clavulanic acid / 2nd generation cephalosporin
- Change antibiotic according to sensitivity
- Repeat culture:
 - after 48 hours
 - and again two weeks after completion of antibiotics

Follow up is obligatory

- U-MCS for all
- Special investigations necessary to rule out underlying UGT abnormalities for
 - All who did not have any antenatal U/S
 - High risk group*

Rationale : >30 % of children with UTI's have abnormalities of UGT

High risk group

- Recurrent infections
- Clinical signs: poor stream/palpable kidneys
- Unusual organism (non E coli)
- Bacteraemia / septicaemia
- Prolonged clinical course / failure to respond
- Unusual clinical presentation in older boy
- Abnormality on antenatal U/S screening

Follow up investigations after 1st UTI

- If 1st UTI < 24 months old - renal ultrasound (US) and MCUG is indicated
- All other : renal US only
- If abnormal do MCUG ± radio-isotope studies
- Conscientious follow up of growth, blood pressure, urine dipstix and culture will provide the answer

Prophylactic antibiotic treatment

- < 5 years old + abn UGT
- Recurrent UTI's with no abn UGT (voiding dysfunction) – treat for 6 months

Important message

- Urine culture is necessary to confirm suspicion
- To confirm UTI, positive culture is necessary
- To treat effectively, sensitivity of organism is necessary
- World wide increasing bacterial resistance