

Pediatric Urinary Tract Infections

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Pediatric UTI Epidemiology

- What are the chances that this baby has a UTI ?
 - UTI s account for 7.5% of febrile episodes in infants < 2 mo vs 1.7% of children < 5 y/o: likelihood decreases with age; high in infants
 - Prevalence preterm infants > term
 - Boys are 5-8 X more likely than girls to be infected; persists for first 3 months of life.
 - In 1st year of life, uncirc'd males >10X incidence of URI than females or circumised males; lifelong
 - Female uti prevalence > males after 3 mo of age.

Arch Dis Child 1969;44,617

BrMJ 1972;1:267

Pediatrics 1982; 69;409

Pediatric UTI Diagnosis

- U/a should be processed immediately; if not, keep refrigerated at 4°C; incubation at room temp for even 1 hour decreases sens/spec
- U/a can suggest dx; ONLY a positive quantitative culture of properly collected urine is diagnostic.
- Urinalysis: leukocyte esterase, nitrites, microscopic examination of WBC and bacteria (stained,unstained, spun, unspun);often used.
 - LE test 76-85% sensitivity; nitrite (29-70% sensitivity)
 - WBC > 5 hpf on spun urine
 - Any bacteria in spun urinary sediment
 - LE and microscopic WBC highly correlated; not necess to do both
 - Negative microscopy for bacteria or negative Gram stain plus negative dipstick LE : high negative predictive value

Pediatric UTI: Diagnosis

Collection Mode	Colony Counts	Prob of Infection (%)
Suprapubic	Gram neg bacilli: ANY Gram pos cocci: $>10^3$	> 99
Catheterization	$\geq 10^5$ $\geq 10^4$ to 10^5	95 Infection likely
Clean voided		
Boys	$> 10^4$	Infection likely
Girls	3 specimens $> 10^5$ 1 specimen $> 10^5$	Infection likely 80%

First voided is best; CFU/ml affected by hydration, recent antibx use

AAP recommends cath or spa; bagged specimen high rate $> 70\%$ false +

Pediatric UTI: Diagnosis

- Other tests: WBC, CRP, ESR low predictive value
- New markers: Procalcitonin: marker of biologic inflammation: increases with endotoxin release; short half life (2-6h); remains high as long as inflammatory stimulus present
- Correlation with pyelonephritis

Does this baby have an UTI?

- Febrile infant 2 mo old with + nitrites and LE: ***very likely*** has an UTI
- *Assumed* to have acute pyelonephritis: immune system, risk of underlying bacteremia, $T > 39$; infants < 2 mo can quickly change clinical status
- Hoberman study 76% of + BC with UTI in infants < 6 mo

Treatment Issues

- Evaluation for invasive infection if toxic appearing: recommended for neonates, infants < 2 mo of age
- Rx: parenteral vs oral: oral rx as effective as IV for pyelo ; decision based on risk of urosepsis, clinical appearance, hydration status, compliance, risk of complications.
- Medications:
 - Parenteral: Amp/gent or third generation cephalosporin good first choice; tailor with culture results; transition to oral meds
 - Oral: T/S consistently higher cure rates than amox
 - Complete 7-14 d course of therapy

Evaluation of UTI

- Routine reculture of sensitive organism not usually necessary, unless: not expected clinical response, sensitivities not available
- Children 2 mo -2 y/o: Imaging: Urinary tract sonography to detect dilatation (obstruction) and a study to detect reflux.
 - Renal USG and either VCUG or RNC (radionuclide cystography)
- Imaging of infants with first UTI recommended to identify renal abnormalities that lead to renal damage.

Pediatric UTI: Antimicrobial Prophylaxis

- High urinary concentrations; low bowel concentrations to reduce effect on bacterial resistance in bowel
- Use in children with frequent recurrences (>3/yr), esp with uropathy
- Risk for recurrent UTI: recurrent uti, uropathy, some VUR, immunosuppression, dysfunctional voiding/bowel

Drug	Dose
Tmp/Smx	2 mg/kg tmp single bedtime dose or 5 mg/kg tmp 2 x/wk
Nitrofurantoin	1-2 mg/kg single daily dose
Sulfisoxazole	10-20 mg/kg div q 12h
Methenamine mandelate	75 mg/kg divided q 12h
Nalidix acid	30 mg/kg divided q 12h

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