

Potty Problems

Febrile UTIs in Children

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Febrile urinary tract infections (UTIs) in children are associated with significant acute morbidity and potential long-term complications. UTIs in febrile children are often over-diagnosed and misdiagnosed, resulting from the common use of dipsticks and the urine cultures obtained by catheterization or “bag samples.”

Symptoms of renal infection in young children are non-specific. Most children present with fever, lethargy, vomiting and irritability. Older children may complain of abdominal or flank pain. Lower urinary tract symptoms rarely present. In contrast, bacterial cystitis, is never associated with fever. In males, UTIs are usually associated with penile discharge.

Ben's case

- Ben, 18-months-old, presents with a 24-hour history of fever (39 C), irritability and poor appetite.
- Ben's physical examination is entirely normal.
- Ben is not circumcised.
- No focus of infection was identified.
- Chemical analysis of the urine shows a positive result for leukocytes.



Other common causes of fever, such as viral infections, usually obtain urine for analysis. A common question is how to obtain a sample of

uncontaminated urine? Ideally, suprapubic aspiration is the preferred method to obtain a clean sample, but it is rarely used.

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A “bag collection device” is the most common urinalysis method and it is considered to be an adequate method, though it is unreliable for culture. As most febrile children are dehydrated, they will not void until adequate fluid replacement is completed, therefore, urine may have to be obtained by catheterization.

What method is preferred in diagnosing UTIs?

Dipsticks are now the preferred method to “diagnose” a urinary infection, however, they are unreliable.¹ Bacteria require an incubation period of four hours to convert nitrates to nitrites, therefore, in most young children, as they void more frequently, this test is not reliable. In addition, only gram-negative bacteria can metabolize nitrates. An infection caused by gram-positive bacteria would not alter the nitrates test. The sensitivity of this test is only 30% to 44%.

The leukocyte esterase test demonstrates the presence of pyuria by histochemical methods, but the test has sensitivities of 53% and 66% in

detecting more than 10 and 20 leukocytes/mm.²

When combining the leukocyte esterase and nitrite tests, the sensitivity to detect a UTI becomes 78% to 92% with a specificity of 60% to 98%. The dipstick urine test seems to be useful in excluding the presence of infection if the results of both nitrites and leukocyte esterase are negative. Any positive dipstick test needs to be confirmed with microscopic analysis of a spun sample of urine.

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The presence of more than 10 white blood cell/high power field and bacteria, in the absence of any inflammatory conditions of the foreskin or introitus, strongly suggests the presence of an acute infection of the urinary tract. Only in the presence of an abnormal urinalysis should the urine be cultured.

What actions are to be taken if the fever is attributed to a UTI?

If the fever is attributed to a UTI, treatment should start promptly and it should be aggressive to decrease the incidence of renal scars.³

If the child is well, able to drink and is to be



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Investigating Ben's Case

The answer is to perform a urinalysis with microscopy.

At microscopy, the sample only revealed three to five white blood cells/high power field and no bacteria, suggesting that the fever is not of genitourinary origin. The positive leukocyte esterase was probably contaminated by the foreskin. The urine should not be sent for culture in this situation, since the acute febrile episode is not related.


treated as an outpatient, an initial dose of cefixime, 16 mg/kg, followed by 8 mg/kg every 24 hours, for 10 days, is adequate (except for patients allergic to penicillin).

Infants and children with known congenital urinary anomalies and children unable to tolerate oral fluids will require admission to hospital for intravenous fluid replacement. Gentamicin, 6 mg/kg, every 24 hours and ampicillin, 50 mg/kg, every six hours should be started on admission to hospital. Renal function assessment will dictate the frequency for future administration of gentamicin. Once the urine culture is reported, the antibiotic can be switched, according to the sensitivity of the cultured bacteria, to an oral antibiotic if the child has been afebrile for 24 hours.

A renal ultrasound should be obtained at the time of admission to rule out obstructive uropathy, as the length of treatment may be altered if any pathology is identified. Also, surgical intervention may be necessary.

Dimercaptosuccinic acid isotope renal scan⁴ can be useful during an acute episode of infection to confirm the presence of an infected kidney. The

scan demonstrates a photopenic area of the renal parenchyma in about 85% of cases.

All children with a confirmed febrile UTI should be further investigated with a voiding cystourethrogram, which can be done as soon as the child is afebrile. There is no need to wait several weeks to perform the study. 

References

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