The benefits of immunisation to the population generally are undoubted, but children should be afforded the same freedom of choice as their parents. Professionals should not assume that attendance and cooperation by a child implies consent. Most children (71%) would be immunised if their parents wished it, even if they themselves did not, suggesting that children are willing to consider and comply with other viewpoints. This response may extend to the state's influence on the benefit of immunisation to the population. Appropriate and necessary involvement of today's socially aware older children may have secondary benefit in influencing the opinions and actions of tomorrow's parents.

The difficulties of informing many children at one time and assessing their competence to give consent provide no excuse for the apparent disregard of children's rights. In not informing children directly and in not ensuring that children were asked if they

consented, the Department of Health and health professionals generally seem to have acted against the spirit and principles of the Children Act, 1989. This has further shown that children's rights are little recognised, poorly respected, and inadequately supported by health professional advocacy.

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Fever can cause pyuria in children

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Rapid, accurate diagnosis of urinary tract infection in childhood is important, and pyuria is often considered critical in diagnosis in addition to the presence of large numbers of bacteria. Clinically important pyuria has been defined as more than 10×10^6 leucocytes/l of urine. Only 1.5% of healthy schoolchildren exceed this.¹ The view that pyuria might occur often in febrile children without a urinary tract infection, perhaps as a non-specific response to fever² has recently been described as untenable.³ We investigated further our clinical impression that pyuria does indeed occur in febrile children without a urinary tract infection.

Subjects, methods, and results

We studied 157 children (73 girls), mean age 2.7 years (range 12 days to 15 years) in a paediatric day unit. Seventy febrile children (temperature $\geq 38^\circ\text{C}$) attended for clinical assessment, and 87 afebrile children (temperature $\leq 37^\circ\text{C}$) attended for various investigations. The febrile and afebrile groups were similar in distribution of age and sex. No child had haematuria, proteinuria, or a urinary tract infection at the time of study, and none had renal tract disease. One of us (GMT) examined a urine sample within 30 minutes of collection by means of a Neubauer counting chamber and phase contrast microscopy at a magnification of 400. Leucocytes were counted in $0.9 \mu\text{l}$ of uncentrifuged midstream urine samples or bag collections of urine in which there were no bacteria present.⁴ Creatinine concentration and osmolality were measured in most specimens. When venesection was indicated clinically (32 febrile and 22 afebrile children) the blood neutrophil count was measured.

Moderate pyuria ($10\text{--}100 \times 10^6$ leucocytes/l) occurred in 30 (43%) febrile children but in only five (6%) afebrile children ($P < 0.001$; odds ratio 12.3 (95% confidence interval 4.9 to 30.8)). Obvious pyuria ($100\text{--}700 \times 10^6$ leucocytes/l) occurred in six (9%) febrile children but in none of the afebrile children ($P < 0.025$). Median values of urinary osmolality were similar in febrile and afebrile groups (660 and 670 mmol/kg). The higher urinary leucocyte counts in febrile children

were not due to increased concentration of urine but to a higher leucocyte excretion rate, estimated from the ratio of urinary leucocyte count to creatinine concentration ($P < 0.001$). Among the febrile children there was no significant relation between the degree of fever and age, sex, blood neutrophil count, or whether they had presented with a convulsion (29 cases).

Comment

This study shows that pyuria is common in feverish children without a urinary tract infection and that it is due to an increase in the urinary leucocyte excretion rate and is not a direct reflection of a raised blood neutrophil count. This suggests that pyuria may be a non-specific feature of fever in acute childhood illness and may reflect a generalised increase in white cell migration, perhaps mediated by changes in membrane permeability or white cell motility.

The fact that almost 9% of febrile children without a urinary tract infection have obvious pyuria is important, particularly now that pyuria may be readily identified by dipstick testing and is usually assumed to be diagnostic of a urinary tract infection. However, pyuria in a febrile child does not always indicate urinary tract infection; the false assumption that it does may lead to inappropriate antibiotic treatment and unnecessary investigations of the renal tract. Possibly more importantly, this assumption may also result in failure to consider other diagnoses in a feverish unwell child.

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