Assessments by 44 parents of three methods of home urine collection

Parents' assessments	No of parents: Pad	Bag	Clean catch
Preference order			
First	21	18	5
Second	19	12	13
Third	4	14	26
Open comments			
Positive			
Easy, hygienic, or quick	25	24	8
Comfortable for child	10	3	0
Negative			
Uncomfortable or distressing	1	26	3
Fiddly or messy	9	10	20
Impractical or time consuming	10	0	36
Difficult to get urine out of pad	8	—	—
Red marks left on skin	—	11	—
Too much trouble—gave up (boys)	1 (0)	4 (3)	9 (5)

organism). Nine samples (8%) from five children (four boys) grew $>10^5$ coliforms/ml, suggesting infection. However, this was excluded by sterile samples collected on the same day or on immediate repeat in hospital.

Parents found the pads and bags easy to use and preferred them to clean catch collections (table) for both sexes. The pad was considered comfortable, whereas the bag was distressing, particularly on removal, often leaking and leaving red marks. Some found extracting the urine from the pad or emptying it from the bag to be awkward. Most parents complained that clean catch collections were time consuming and often messy; nine gave up after prolonged attempts. Five parents whose infants voided immediately ranked it best. The median collection time was 25 minutes for each method, but parents resented constraining their children this long for clean catch collections.

Comment

This is the first study of parents' views of infant urine collection methods. Pad, bag, and clean catch samples were equally effective at excluding an infection; variations in contamination rates balanced collection failures. Most parents disliked clean catch collections; their views should be heeded. Most preferred pads to bags, and they are cheaper. They also found inoculating dipslides with swabsticks easy; this technique may have contributed to their relatively low contamination rates.[3 4]

Since Kass suggested a diagnostic cut off of a single bacterial species cultured at $>10^5$/ml, it has been widely taken as proof of a urine infection and assumed not to occur from skin contamination, even though his study[5] and others[3] recorded similar false positive rates to ours. False positive results potentially lead to inappropriate treatment and imaging. Suprapubic puncture is an unrealistic alternative in primary care. Although collecting multiple samples would reduce the false positive rate, it might delay antibiotic treatment.

We thank the parents for volunteering and their thoughtful comments and Dr Mohammad Raza for microbiological help.

Contributors: MGC had the original idea for the study and is the guarantor. The study was designed, the data analysed, and the paper written jointly by all the authors. LDTL carried out the clinical aspects and DMN and SJP the laboratory aspects of the study.

Funding: None.

Competing interests: The Children's Kidney Fund of the Newcastle University Hospitals special trustees receives royalties from Ontex UK from sales of Newcastle sterile urine collection packs.

1 Jadresic L, Cartwright K, Cowie N, Witcombe B, Stevens D. Investigation of urinary tract infection in childhood. *BMJ* 1993;307:761-4.
2 Vernon S, Foo CK, Coulthard MG. General practice management of children with urinary tract infection: an audit in the former Northern region. *Br J Gen Pract* 1997;47:297-300.
3 Hardy JD, Furnell PM, Brumfitt W. Comparison of sterile bag, clean catch and suprapubic aspiration in the diagnosis of urinary infection in early childhood. *Br J Urol* 1976;48:279-83.
4 Macfarlane PI, Houghton C, Hughes C. Pad urine collection for early childhood urinary-tract infection. *Lancet* 1999;354:571.
5 Kass EH. Asymptomatic infections of the urinary tract. *Trans Assoc Am Phys* 1956;69:56-63.

(Accepted 22 February 2000)

Corrections and clarifications

ABC of vascular disease: Vascular complications of diabetes

An error crept into a figure in this article by Richard Donnelly and colleagues (15 April, pp 1062-6). In the Kaplan-Meier plot at the top of p 1065, the definition of less tight control should be $<180/105$ (not $<180/85$) mm Hg.

Minerva

Minerva slipped up on two names, one personal and one taxonomic, in the picture article in the issue of 18 March (p 814). The third author's name is R Whitfield; the culture grown was *Mycobacterium marinum*.