Commentary (2)

The reason for imaging the renal tract after a urinary tract infection is to look for a cause and detect renal damage so that appropriate management can be instituted. Originally imaging was limited to IVU and MCU. Later ultrasonography was introduced and more recently DMSA scintigraphy became available. With this increase in available imaging methods has come debate about which are the most appropriate investigations. This debate and some sensible recommendations are well summarised in a report from the Royal College of Physicians in 1991. This advises ultrasonography, MCU, and a DMSA study in those under 1 year, and ultrasonography and a DMSA study for those between 1 and 7 years, with MCU reserved for a small number with specific indications. Over the age of 7 ultrasonography alone is recommended with a DMSA study for recurrent infections, MCU being rarely needed except for children with an abnormality of the upper renal tract. The DMSA scan may be delayed until three months after the infection to avoid detecting transient abnormalities which do not progress to scarring. This article stresses the importance of further research. A far less selective approach is advocated in a recent paper from the Karolinska Institute, with all children up to 16 years having MCU and an initial (at five days after diagnosis) DMSA scan, repeated in the majority on two further occasions. How far do the present two papers help to clarify our views about what investigations to do and when to do them?

The second paper describes 10 cases where appropriate investigations were not performed causing considerable delay in diagnosing renal damage. In most cases there was also marked delay in performing any investigations at all. However, these cases were originally investigated between six and 15 years ago. By following the guidelines of the Royal College of Physicians, in none of these cases would serious pathology have been missed. Surely paediatricians do not need reminding now of the importance of prompt investigations and of the limitation of ultrasonography.

The first paper based on a study between 1986 and 1991 is more pertinent to modern practice. This compares ultrasonography with IVU, DMSA studies, and MCU. Taking IVU as the gold standard for detecting renal scarring, ultrasonography only detected 45% of those cases with scarring. Ultrasonography was not surprisingly abnormal in only 40% of cases with reflux on MCU. DMSA studies performed soon after acute infection showed transitory abnormalities that resolved later in 10% of the children studied. Apart from this, IVU and DMSA studies showed nearly 100% correlation in detecting renal scars. At least two imaging techniques are advised, but which two are not stated and there is no differentiation by age.

On the positive side this paper highlights the limitation of ultrasonography in inexperienced hands, but the importance of this, as its main message, depends on the unreferenced statement that ultrasonography alone has been suggested as an adequate method of investigating the urinary tract after a UTI. This would surely not be acceptable since publications such as that from the Royal College of Physicians in 1991, and a more recent one from Oxford in 1993. However, if this message does need good documentary support this paper supplies it.

On the negative side, is MCU really necessary in all children, over 1 year, if the kidneys are normal? MCU is an unpleasant investigation and involves gonadal irradiation. It can be reserved, in children over 1 year, for those in whom the DMSA scan shows an abnormality or those with recurrent infection. A DMSA study is usually regarded as being more sensitive than IVU in the detection of renal scars. IVU is no longer indicated for this purpose. Long term follow up is needed, since our present data on the complications of scarred kidneys is based on IVU findings. It may well be that small scars on DMSA scans are not important. This is a further area for research.

Ultrasonography is essential as one of the initial investigations to detect obstructive lesions as it is unlikely that all would be detected antenatally even if all women had an antenatal scan. The variability in ultrasound measurement of renal length is comparable with the expected annual increase in the length of kidneys during childhood but ‘confusion between the kidney and the splenic or hepatic flexure of a loaded colon or a hepatic lobe’ (paper 2) should not occur in experienced hands. We agree that ultrasonography should not be used to look for reflux and its limitations in the detection of renal scarring are well known. We would not routinely advocate MCU in children over 1 year with a normal upper urinary tract. This is an unpleasant investigation at the very least, and the significance of reflux with a normal kidney is not known. The detection of severe reflux when investigating a baby found to have hydronephrosis antenatally gives the opportunity to mount a controlled trial of treatment with antibiotics versus antibiotics. A similar situation pertains to reflux in asymptomatic siblings of known cases of VUR. Controlled studies in this field are lacking at the moment.

Rather than the extensive investigations described in both these papers and the one from the Karolinska Institute, we advocate following the Royal College of Physicians guidelines until further research, as suggested, has been performed.

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Authors’ response
We are grateful for the opportunity to respond to our colleagues’ comments on the investigation of children with UTI.

(1) Both commentators recommend following the Royal College of Physicians’ guidelines1 but it should be noted that those pertaining to investigation ‘must be considered interim suggestions until the results of more definitive research are available’.

(2) The working party recognised the need for further assessment of the sensitivity and specificity of ultrasonography, DMSA scan and IVU in the detection of renal abnormalities. Our paper comparing four methods of investigation of children with UTI addresses this question.

This study indicates that ultrasonography alone is inadequate for investigating children with UTI at any age and the histories of children in the ‘pitfalls’ paper, illustrate how unreliable dependence on a single imaging modality may be. We made no firm recommendations because any scheme of investigation will be determined not only by the child’s age and clinical history, but also by the facilities and expertise available: all district general hospitals do not yet have access to either nuclear medicine facilities or specialist ultrasonography.

(3) Audit, as recommended in the report of the Royal College of Physicians, will test the assertion of Drs Moncrieff and Lindsell that paediatricians no longer need to be reminded of the importance of prompt investigations or the limitations of ultrasonography. Unfortunately, children similar to those described in the pitfalls paper, all but two of whom were first investigated between 1987 and 1991, continue to present to specialist paediatric renal clinics with unacceptable frequency.

(4) Dr Verrier Jones’ counsel of perfection for the performance of ultrasonography may improve its sensitivity, but as both commentators agree, this remains an inappropriate technique for the diagnosis of VUR and renal scarring.

Contrary to the statement of Drs Moncrieff and Lindsell, children in the comparative study were investigated by experienced imagers. Even under optimal conditions, as recently reported in a study from Göteborg, 10 examiners obtained sensitivities for renal scarring ranging from 30–80%, and false positive rates of 6–33%.

(5) We agree with, and have repeatedly stated, Dr Verrier Jones’ view that the prevention or limitation of acquired scarring depends first on the rapid recognition and treatment of UTI, but also on prevention of further infection until its cause is known.

A controlled trial of prophylaxis or no prophylaxis in children with reflux, which she suggests, could give valuable information. However, we found considerable difficulty in recruiting patients, with informed consent, to such a randomised prospective study, set up in 1987. Among the 20 children enrolled, one without prophylaxis developed a small scar (unpublished). Observations on schoolgirls aged 5 years and over with ‘screening’ bacteriuria receiving either no treatment or short courses of prophylaxis are not relevant in this context. More pertinent perhaps is that 22% of 120 children, aged 0–12 years, with symptomatic UTI and reflux treated with short courses of antibacterial drugs for recurrent UTI developed new scars compared with 2% of 75 children of similar age with reflux receiving uninterrupted low dose prophylaxis.