Effect of vesicoureteric reflux on renal growth in children with urinary tract infection

 Commentary

 S R MEADOW

 Department of Paediatrics and Child Health, St James's University Hospital, Leeds.

 The paper by the Newcastle group and the paper by Jean Smellie and her colleagues provide further information which may help to answer the question ‘Does urinary tract infection matter?’ It is an important question because the answer will influence the amount of resources that should be allocated to the detection, investigation, and treatment of childhood urinary tract infection.

 The question really should be expanded: how much does urinary tract infection matter for the long-term health of the child, and if it is potentially harmful can current treatment prevent such harm?

 The dangers of urinary tract infection to the developing kidney may have been overstated in the past. Pyelonephritis was alleged to be responsible for a large proportion of end-stage kidney disease in adults. This was partly because the radiological and histopathological diagnosis of end-stage kidney disease resulting from infection could not be differentiated satisfactorily from other forms of end-stage kidney disease. Infection tended to be incriminated too frequently. As other causes of end-stage renal disease have been identified, the number of kidneys believed to be damaged by infection has been reduced. For both children and adults with end-stage renal failure, urinary tract infection is considered to be responsible in an ever-diminishing minority. However, there is no doubt that urinary tract infection in children in certain circumstances (particularly an obstructed urinary tract) may harm the kidneys severely.

 When one considers the extraordinary commonness of urinary tract infection in childhood and the rarity of severe functional impairment from infection, it is clear that only a tiny proportion of children with urinary tract infection will incur such kidney damage. Those who believe that most kidney scars are congenital point to the rarity with which scars are seen to develop during serial radiological observations of children, and to the fact that the prevalence of scars in kidney x-ray films does not increase with age in the way that one would expect if scars were being incurred during childhood.

 When urinary tract infection is causing symptoms we all agree that it matters and should be treated. The problem arises with the large group of children who have recurrent or ‘covert’ bacteriuria. It is worth remembering that many of the children with ‘covert’ bacteriuria do have minor symptoms. They may not have asked their doctors for help but perhaps they should have done so, because many of them have a troublesome amount of frequency and urgency of micturition. Others have daytime dribbling and wet, smelly pants which cause much unhappiness. Those with symptoms, however slight, should be treated and allowed to be free of such symptoms.

 Nevertheless there are some children with bacteriuria who seem to have no symptoms whatsoever. Does that bacteriuria matter? The Newcastle group are confident that, if the kidneys are radiologically normal, the bacteriuria is not harmful. They are less sure if the child already has a scarred kidney on x-ray film. Does VUR matter? If the urine is sterile most would agree that reflux does not matter. Moreover it is probable that only major reflux which distends the renal pelvis (for example, grade 4 reflux), and thereby generates enough pressure to cause intrarenal reflux in susceptible papillae does matter, and that it matters only if the urine is infected at the time. Since one-third of children do not seem to have susceptible papillae they may not be at risk at all despite the degree of reflux and infection; for the other two-thirds who do have the type of papillae which Risdon and Ransley have shown to be associated with intrarenal reflux, the children may have incurred their renal scarring by the time they present, and that part of the kidney which is drained by normal papillae will be at fairly low risk. Therefore those who believe in particularly active management or in antireflux surgery for children who have a renal scar may really be trying to shut the stable door after the horse has bolted; what they really believe in is active management before the scar has appeared. Unfortunately the scar is most likely to be incurred at the time of the first infection; by the time the child presents to a doctor the risk of further damage may be slight. Therefore the Newcastle group with their great experience of the feasibility, and the expense and trouble of screening procedures for bacteriuria conclude, as have others, that such screening is not justified until a simple method is available for detecting children at risk of incurring future kidney damage.

 Can current treatment prevent kidney damage from infection? Dr Smellie and colleagues have shown during their long follow-up of children with urinary tract infection that both health and kidney growth were good during a period of careful medical management that paid attention to the fluid intake, and improved the pattern of micturition and long-term low-dose chemotherapy. As with other similar clinics, surgical reimplantation has been reserved for the small group of children in whom medical management was unsuccessful. In the present paper
they stress again the fact that kidney growth may be impaired in a kidney that is scarred or in one that is infected. Reflux itself did not seem as significant. Some people may ask if the patients would not have done just as well without the antibiotics and the careful management. In their series those kidneys which grew least well had established severe scarring associated with severe persisting reflux at the beginning, and each of them had further infection during the period of observation. They point out that it is in this group that a controlled trial of medical and surgical treatment is required. Until convincing results of such trials appear it is likely that most paediatricians will rely on careful medical management for this group of children, and that many will reserve chemotherapy for children with troublesome symptoms, regardless of the radiological findings.

The following articles will appear in future issues of this journal:

Reduction of skin water loss in the newborn  
**J E H Brice, N Rutter,** and **D Hull**

Systemic lupus erythematosus with nephritis  
**M C Morris,** **J S Cameron,** **C Chantler,** and **D R Turner**

Whooping cough—a study of severity in hospital cases  
**D A Robinson,** **B K Mandal,** **A G Ironside,** and **E M Dunbar**

Changing blood culture isolates in a referral neonatal intensive care unit  
**O Battisti,** **R Mitchison,** and **P A Davies**

The steatocrit: a simple method for estimating stool fat content in newborn infants  
**P Phuapradit,** **A Narang,** **P Mendonca,** **D A Harris,** and **J D Baum**

Brain death in children  
**R O Robinson**

Effects of maternal smoking on fetal growth and nutrition  
**A R J Bosley,** **J R Sibert,** and **R G Newcombe**