Urinary tract infection in children: a survey of management

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SUMMARY. Two hundred and forty general practitioners were questioned on their management of urinary tract infection in children. The liaison with hospitals in treating urinary tract infection in children was also evaluated. While the survey showed enthusiasm among general practitioners to treat the condition, there was evidence in a significant minority of cases of delayed referral to hospital based on outmoded practice. Detailed analysis of the questionnaire and a statement of present policy is reported.

Introduction

URINARY tract infection (UTI) in children is common and must be regarded as significant in every case. Children still, however, present late with advanced urinary tract pathology. This survey was therefore instituted to examine aspects of management of childhood urinary tract infection in general practice and hospital in order to elucidate areas where improvement, resulting in more early referrals for investigation, could be made.

Methods and Results

The questionnaire (see Figure 1) was designed jointly by The Royal Belfast Hospital for Sick Children and the Department of General Practice, Queen's University of Belfast. Two hundred and forty principals were chosen from 790 principals present on the Medical List for Northern Ireland on 1 July 1981. This represented a percentage survey of 30.4 per cent. This percentage was applied to each Health and Social Services District to determine the size of the same from each area. Thereafter, the selection of principals was made entirely at random using the doctor's code numbers.

Of the 240 practitioners included in the survey, 125 (52 per cent) returned the questionnaire. All answered questions 1 and 2. Questions 3, 4, 5 and 6 were left unanswered in four, 12, five and 15 instances respectively. Of the 12 doctors who failed to answer question 4, nine gave section (a) as the answer to question 3 and may have considered it unnecessary to respond to question 4.

Table 1. Response to question 1. General practitioners' intention to obtain a midstream specimen of urine (MSSU) compared with success.

	Percentage of general practitioners ($n=125$)
Intended	
All cases	*64.0*
Recurrent cases	*12.5*
Vague symptoms cases	*12.5*
Actually obtained (percentage of cases)	
100	*49.0*
75	*73.0*
50	*27.0*
10	*9.0*

The response to question 1 is shown in Table 1. Sixty-four per cent of general practitioners attempted to obtain a midstream specimen of urine (MSSU) from all their patients with suspected urinary tract infections, and 75 per cent success was achieved by 73 per cent of the doctors. The 11 per cent unaccounted for in Table 1 is explained by failed responses and those answers which were unclassifiable.

The responses to questions 2, 3, 4, 5 and 6 are presented in Table 2. The most important results were that 78 per cent of respondents still regard one infection in a boy and more than one infection in a girl as the significant clinical status, and that 70 per cent estimated that a urinary tract infection carried a pathological correlation of less than 25 per cent.

Discussion

Urinary tract infection in children is common, with an estimated 5 per cent of girls and approximately half that number of boys presenting with the symptoms at some time;[1] only in the first year of life is urinary tract

Figure 1. *The questionnaire designed by The Royal Belfast Hospital for Sick Children and the Department of General Practice, Queen's University of Belfast.*

Questionnaire re urinary tract infection

1. a) Under what circumstances would you take steps to confirm a urinary tract infection by laboratory investigation before commencing treatment?
   b) Please estimate what percentage of patients you would subject to laboratory confirmation.

2. What do you consider are the indications for investigation of the urinary tract in children? (Delete that which is *not* applicable).
   a) One positive MSSU
   b) More than one equivocal MSSU
   c) One equivocal MSSU plus urinary symptoms
   d) More than one episode of urinary symptoms with negative MSSUs
   e) One positive MSSU in a boy. More than one positive MSSU in a girl

3. Hospital monitoring of urinary tract pathology often includes regular—for example, monthly—MSSU checked by the family doctor. Assuming satisfactory laboratory service do you consider this: (Tick appropriate box)
   a) Practical and generally satisfactory
   b) Impractical
   c) A bad way to carry out a necessary exercise*

4. Are the shortcomings of the system referred to in (3): (Tick appropriate box)
   a) Delay in communication of results so that the specimen is out of date
   b) A high percentage of contaminated specimens
   c) Failure of patients to provide specimens
   d) Failure to get specimens to the laboratory quickly enough (within a few hours)

5. In children with confirmed urinary tract infections would you expect an abnormality on IVP or micturating cystogram to be detected in:
   a) 0–25 per cent of cases
   b) 25–50 per cent of cases
   c) Over 50 per cent of cases

6. In your experience are long-term courses—for instance, three months of antibiotics—adhered to by patients in: (Tick appropriate box)
   a) 0–25 per cent of cases
   b) 25–50 per cent of cases
   c) 50–75 per cent of cases
   d) 75–100 per cent of cases
   e) Impossible to assess

*Please state any changes you think would be helpful to the system at the end of the questionnaire.

Comments:

infection in boys on a par with that in girls.[2] The great difficulty with this condition is that the classical symptoms are frequently not in evidence, partly as a consequence of younger children's inability to communicate accurately as to how they feel resulting in a vague history of perhaps 'tummy pain', 'off colour,' etc. The non-specific nature of presentation in the very young, coupled with the knowledge that perhaps only 15 per cent of suspected urinary infections in girls are ever proven as such,[3] opens a great hiatus through which genuine cases may escape. The danger here is that 50 per cent or more of children with a single proven infection of the urinary tract will have a structural or functional abnormality in the urinary system detectable on intravenous pyelogram (IVP) and micturating cystogram (MC).[4-6] About one third will have vesicoureteric reflux,[4-6] and this fact alone makes a strong case for referral of all children to hospital once the presence of a urinary tract infection is confirmed or if recurrent infection is suspected without having been unequivocally diagnosed. The urgency of the situation is underlined by awareness that the overwhelming majority of pyelonephritic scarring occurs before five years of age and that thereafter antibiotic prophylaxis may have little effect on prognosis.

Despite the present level of knowledge, children still come late to hospital with advanced renal pathology, and it was in an effort to determine where the breakdown occurs that this survey was undertaken.

The response to the first question gave an indication of what percentage of family doctors screen children with suspected urinary tract infection and how often they are successful in obtaining midstream specimens of urine. It is clear that the majority of those questioned do try to obtain an MSSU in cases of suspected urinary tract infection, but the 25 per cent of doctors who screen only patients with recurrent or vague symptoms leaves little doubt that a sizeable proportion of infections will be missed at this level, particularly when 27 per cent admitted that their success in obtaining urine samples fell below 50 per cent. The reasons for such a figure could be various and not all attributable to the doctor, but whatever the cause it is bound to lead to further missed diagnoses.

Table 2. Responses to questions 2, 3, 4, 5 and 6.

	Percentage of general practitioners responding to question section				
Question	a	b	c	d	e
1 (n=125)	*16*	*28*	*28*	*50*	*78**
2 (n=121)	*81*	*6*	*8*		
3 (n=113)	*16*	*24*	*27*	*41*	
4 (n=120)	*70*	*25*	*2*		
5 (n=110)	*24*	*16*	*15*	*19*	*33*

*24 participants gave 2e as their only criteria for referral to hospital.

The criteria for referral is of course crucial. As both boys and girls exhibit high pathological correlation,[4-7] and with the nature of presentation being so indefinite, one cannot afford to have a different policy in referral to hospital for girls or boys and neither can one presume that the first urinary infection encountered in a child is indeed his or her first: all confirmed cases must therefore be referred to hospital for investigation. This survey demonstrated quite clearly that the majority of family doctors still adhere to the practice of referral of boys with their first infection and girls with their second—a policy still taught in many medical schools: indeed 24 per cent of that 78 per cent regarded this as the only criterion. This policy must be abandoned. Only 16 per cent of respondents regarded investigation necessary on the strength of a single confirmed infection, and this must represent an area where delay can be reduced. Coupled with question 5, question 2 indicates the most obvious area of breakdown as only 2 per cent of participants estimated the pathological correlation of urinary tract infection to be >50 per cent; even if we take into consideration that some would dispute this figure, 70 per cent estimated the correlation at >25 per cent which is much too low, and it is hoped that referrals will be earlier if the true significance is appreciated.

Practical problems in management were examined in questions 3 and 4. The current systems of regular hospital visits complemented by a monthly MSSU taken by the family doctor was regarded as satisfactory by 81 per cent of respondents. None who regarded the system as unsatisfactory commented on ways to improve it. The areas of breakdown suggested in question 4 received broad incrimination. Failure to get specimens to a laboratory was marked by 41 per cent and this has become an area of concern as the system appears to be deteriorating under present economic restraints and in some areas collections are no longer carried out. Perhaps this could be offset if direct microscopy was practised more frequently by family doctors, which would at least allow a diagnosis to be made in the majority of cases although not providing a culture with sensitivities. Extensive use of dip slide techniques would also help to allay problems in this area. Delay in communication of results from laboratory and hospital received attention from only 16 per cent of doctors but there is no doubt that this area could be improved with greater endeavour by the staff concerned, at least to the level where the human factor can be reduced no further.

The family doctor's estimation of his patients' adherence to long-term antibiotics in question 6 was fairly mixed and would quite likely be repeated for many other long-term medications. This point is relevant to the management of vesicoureteric reflux in particular, as there is strong evidence to suggest that long-term antibiotics produce at least as good results as surgery in less severe cases.[8] Such an approach presumes rather optimistically that the doctor's prescription will be administered in the home for up to a number of years.

The decision to refer a patient to hospital can be a difficult one for the general practitioner; on occasion referrals are not made because the family doctor is unsure of what the specialist would wish to see. Therefore, in order to remove any misunderstanding in this area with respect to urinary tract infection, a joint statement from the consultant (Medical and Surgical) staff of the Royal Belfast Hospital for Sick Children was issued, via the Department of General Practice, Queen's University of Belfast, to all those initially supplied with a questionnaire, which covers a large percentage of practices in Northern Ireland. Our main concern was the long-term response of those who did not return the questionnaire initially as this proportion approached 50 per cent, but we hope that the effect will be to reduce substantially the 10 per cent of renal transplant patients who start their medical history with a single urinary tract infection in childhood.[9]

Some will dispute the significance of urinary tract infection in the general population and the policy of referral which we advocate. However, until there is a means of determining that renal damage is not occurring which can be confidently carried out by the family doctor, it is difficult to regard even a single presenting urinary tract infection as incidental. The family doctor who feels it unjustified to advise further investigation must be prepared to follow the child with urinary tract infections with regular MSSU checks for a number of years even though the patient may be 'asymptomatic'.

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