asthmatic and healthy subjects, indicating that increased numbers of neutrophils in the airways could not account for the bronchial hyperresponsiveness, which was present in all of our asthmatic subjects.

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High altitude testing of pulse oximeter

Michael Glanfield

British Caledonian Airways, Crawley, West Sussex RH10 2XA
Michael Glanfield, MB, medical officer

Correspondence to: 1 The Drive, West Wickham, Kent BR4 0EP.

Portable pulse oximeters are a useful monitoring tool for air ambulance work. Over the past 15 months I have used an oximeter (the Nellcor N-10 unit) when monitoring patients returning to Britain in a wide range of civil aircraft including a Lockheed Tristar, Boeing 737, Lear 35, De Havilland Twin Otter, Bandeirante, BAC 1-11, and Dash-7. The unit worked reliably in all these aircraft and gave results that were similar to those predicted up to the maximum altitude on these flights (11 000 feet; 3350 m). I tested whether the oximeter would work at higher altitudes and also noted the subjective effects of exposure to altitude hypoxia.

Method and results

The Cessna 310 is a twin engined unpressurised aircraft that can climb to a maximum altitude of 27 400 feet (8350 m). I used myself as a fit, unacclimatised subject with a normal haemoglobin concentration (147 g/l) and made readings of arterial oxygen saturation and pulse rate every 150 m up to 24 100 feet (7350 m). At this altitude my mental performance deteriorated considerably, and I was given 60% oxygen by mask. I continued to make readings up to 27 000 feet (8235 m), when the aircraft was unable to climb any more.

The figure shows the changes in oxygen saturation

Arterial oxygen concentration, pulse rate, and physical and mental symptoms with increasing altitude over 63 minutes

and pulse rate and the symptoms of hypoxia with altitude. Below a saturation of 50% the oximeter gave a delayed reading and therefore could not be considered reliable or easy to use. Above 50% saturation, both during the ascent and at high altitude when I was receiving oxygen, the unit was reliable and seemed unaffected by the change in pressure.

Comment

The Nellcor N-10 pulse oximeter worked reliably up to an altitude of 27 000 feet (8235 m), although it was difficult to use at oxygen saturations below 50%.

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Current practice in managing urinary tract infections in children

Rosalind L Smyth, L Berman, H B Valman

Department of Paediatrics, Ipswich Hospital, Suffolk IP4 5PD
Rosalind L Smyth, MRCP, registrar

Northwick Park Hospital, Middlesex HA1 3UJ
L Berman, FRCP, senior registrar in radiology
H B Valman, FRCP, consultant paediatrician

Correspondence to: Dr Valman.

The management of urinary tract infections in paediatrics is controversial. Recently, with the advent of sophisticated imaging techniques, many different diagnostic pathways have been advocated.^{1,2} We conducted a survey of paediatricians in both district general and teaching hospitals to elucidate current practice in the United Kingdom.

Methods and results

From a total of 745 consultant paediatricians 120 were randomly selected and sent a detailed questionnaire concerning the investigation, treatment, and follow up of children with urinary tract infections. Ninety eight consultants (82%) replied, including

16 who were not concerned with managing these infections, one who did not complete the questionnaire, and two who completed one questionnaire between them. Thus we analysed a total of 80 questionnaires.

The table shows the responses to five questions. A further question concerned the investigations that were performed after a proved infection had been found and whether they depended on sex and the number of infections. The results were analysed into broad categories: 22 respondents routinely obtained only an ultrasound scan or an intravenous urogram; 26 obtained an ultrasound scan or a urogram in all patients and a micturating cystourethrogram either in all patients or in those below a specified age; 17 obtained an ultrasound scan or an intravenous urogram, a cystourethrogram, and either a diethylenetriamine penta-acetic acid (DTPA) scan or a succimer (DMSA) scan; 11 obtained an ultrasound scan or a urogram and a cystourethrogram and requested diethylenetriamine penta-acetic acid or succimer scans if the results of any of the first three were abnormal; and four gave replies that did not fit into any of the above categories.

Thirty three respondents thought that boys should

	Response		
	Yes	No	Equivocal
(1) Do you have a rigid policy for managing all urinary tract infections?	36	42	2
(2) Does your hospital have a clinic dedicated to urinary tract infection?	17	63	
(3) In your opinion should all children with urinary tract infections be referred to hospital for radiology and management:			
While acutely ill?	21	55	4
For subsequent management?	68	11	1
(4) Do you accept as evidence of infection a positive urine culture that has been obtained in the community?	37	35	8
(5) In your hospital, apart from conventional radiology, do you have access to:			
Ultrasonography?	80		
Radioisotope investigations?	61	19	

be managed differently from girls, and 38 investigated a second infection more thoroughly than the first in one or both sexes. Twenty five stated that they would adopt different diagnostic pathways in young patients, and 35 stated the age at which they considered it safe to stop antibiotic treatment in a child with vesicoureteric reflux: in both cases there was no unanimity about the critical age. When asked whether any investigations were routine before prophylactic antibiotic treatment was stopped 40 replied yes, 33 replied no, and seven replies were equivocal. Those who answered yes were then asked which investigations they performed. Among the 40 replies there were 24 different schemes, which were not analysed further.

Comment

Our results show an alarming conflict of practice, with recent reports equally confusing. The practices

used by many of the respondents were certainly at variance with the current understanding of the natural course of urinary tract infections in children. Two recent review articles published in the same journal presented quite different schemes of investigation.^{1,2} Nuclear medicine studies are integral to many of the proposed pathways of treatment,^{3,4} but as almost a quarter of our respondents had no access to such facilities these schemes had little relevance to them. The sensitivity of imaging techniques, in particular ultrasonography, depends on local skill. We question, as others have,⁵ whether the experience of well equipped teaching centres is relevant in district hospitals, where most children are investigated.

We conclude, firstly, that the management of urinary tract infection is in disarray and that experts should suggest a common approach, which would ensure rational, safe, and consistent management throughout the United Kingdom; and, secondly, that any investigative protocol should be realistic and suitable for implementation by all paediatricians.

We thank all the paediatricians who completed the questionnaires.

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Repeated aspiration of breast abscesses in lactating women

J M Dixon

Department of Surgery,
Royal Infirmary, Edinburgh
EH3 9YW
J M Dixon, FRCS, lecturer

The standard treatment for breast abscesses in lactating women is incision and drainage.^{1,2} This requires a general anaesthetic, usually at least an overnight stay in hospital, and regular postoperative dressings. This may cause considerable distress to both mother and baby during what is already a difficult time, and the final cosmetic result is often unsatisfactory. The aim of this study was to determine whether breast abscesses can be treated without an operation or admission to hospital.

Patients, methods, and results

Six women aged 24-32 (mean age 27) presented three to eight weeks post partum with a breast abscess (table). All were breast feeding and had had at least 48 hours' treatment with flucloxacillin before being seen. Initial treatment consisted of aspirating as much pus as possible from the abscess with a 19 gauge needle and syringe and a seven day course of oral flucloxacillin, 500 mg four times daily. Samples of pus from all six women were sent to the bacteriology department for culturing and testing for sensitivity to antibiotics. The women were given the option of continuing to breast feed from either breast; none were given drugs to suppress lactation. Aspiration was performed three times weekly until no more pus was aspirated, and all of the patients were reviewed after three weeks and three months.

Volumes of pus of 15-40 ml (mean 26 ml) were

aspirated at the initial visit. *Staphylococcus aureus* (sensitive to flucloxacillin) was the only organism isolated from all six samples. Three of the women had pus aspirated on three occasions, two had pus aspirated on four occasions, and one required five aspirations (table). Redness of the overlying skin and tenderness had reduced in all of the women by the third visit. The volumes of pus aspirated fell with each successive aspiration in all six women.

Data on six lactating women with breast abscesses treated by repeated operation

Case No	Age (years)	No of weeks post partum	Initial volume aspirated (ml)	No of aspirations of pus
1	24	3	30	4
2	25	8	15	3
3	26	3	26	5
4	26	4	40	4
5	28	3	24	3
6	32	6	18	3

At review three weeks after the last aspiration all of the women were well with no symptoms, and by three months no clinical abnormality was palpable at the site of the previous abscess. Four women stopped breast feeding after the initial visit, but two continued to breast feed throughout the period of treatment. All six women were pleased that they had avoided an operation, an admission to hospital, and separation from their babies and family.

Comment

Breast abscesses in lactating women are now uncommon.² This is probably because many women with sepsis of the breast are treated successfully with