

is in large measure about and what society needs from nurses and doctors. And it's a fact that it is not so much that traditional medical education does not inculcate positive attitudes towards the elderly: the attitudes are often there in first-year students, but gradually become eradicated.

Shaping attitudes

MR KLEIN: You're a professional attitude shaper—but supposing you're unsuccessful in persuading people to like geriatrics. Unpleasant people like myself might argue that redundant doctors (in pathology and obstetrics, for example) should be forced into practising geriatrics. The universities are faced with exactly the same problem: far too many theologians and sociologists. Why should a large amount of public money go to keep such people in tenure when the need for them has long since passed? Should we guarantee people a *particular* job for life, as distinct from a job? Is a press-ganged geriatrician who loathes his work better than no geriatrician at all?

DR ARIE: We have constantly to make decisions on priorities. Filling some specialties means denuding others. Should we deflect nurses away from cardiology into geriatrics and psychiatry? And even within a specialty priorities are a problem: at Goodmayes Hospital we have a splendid community nursing unit, for which there is no shortage of good applicants. Excellent nurses apply for vacancies in that unit, but they come from our total pool of manpower and every appointment made means one less good nurse in the wards. In a finite system, every decision has consequences for other parts of the system.

Appointments of speakers

- (1) Mr Rudolf Klein, MA, senior fellow, Centre for Studies in Social Policy, London
- (2) Mr J R Butler, MA, assistant director, Health Services Research Unit, University of Kent

- (3) Dr J Weston Smith, MB, CHB, general practitioner, Tamworth
- (4) Dr A J Smith, BM, BCH, assistant editor, *British Medical Journal*
- (5) Dr Beulah Bewley, MD, MSC, senior research fellow, Department of Community Medicine, St Thomas's Hospital Medical School, London
- (6) Dr Gordon Macpherson, MB, BS, assistant editor, *British Medical Journal*
- (7) Dr R A A R Lawrence, MB, CHB, general practitioner, Derby
- (8) Dr Peter A Clark, MB, MRCP, consultant pathologist, Barnet General Hospital
- (9) Mr P McNally, MB, FRCS, surgical registrar, Royal Infirmary, Glasgow
- (10) Dr Anne Savage, MB, BS, general practitioner, London
- (11) Dr Celia Oakley, MD, FRCP, consultant cardiologist, Royal Postgraduate Medical School, London
- (12) Mr F S A Doran, MD, FRCS, consultant surgeon, Bromsgrove
- (13) Dr S R Bhate, MB, MRCPsych, consultant children's psychiatrist, Leicester
- (14) Dr Tom Arie, BM, MRCPsych, consultant psychiatrist, Ilford

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Hospital Topics

Tuberculosis infection in a paediatric department

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Summary

Sputum-positive tuberculosis was diagnosed in a member of the medical staff of a paediatric department. Four children were infected, all suffering from debilitating diseases. Three of them had evidence of pulmonary tuberculosis. Eighty-two infants in the baby care unit during the eight weeks before the diagnosis of the index case were given insurance isoniazid treatment. None developed tuberculosis. Whereas nearly all the non-medical adult contacts were traced and examined,

fewer than half the medical contacts attended for chest radiography.

All babies in the pre-allergic phase of contact, and all children whose natural immunity is likely to be depressed, should receive antituberculosis insurance chemotherapy.

Introduction

An unrecognised source of tuberculous infection in a paediatric or maternity unit may have serious consequences if any of the infants or children are infected. The morbidity after infection of infants is great¹ and would be even greater in children suffering from other debilitating infections or diseases likely to further depress the immunological response.

It is remarkable that such outbreaks have not been reported more frequently. Only one similar incident has been reported in the past 20 years.²

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CASE REPORT

Early in December 1972 a young resident doctor, who had been employed for five months in the paediatric department with duties in the maternity department's baby care unit, had a haemoptysis and was admitted to hospital. Acid-fast bacilli were seen in his sputum and his chest radiograph showed an infiltrative lesion with cavities in the right upper lobe of his lung. He had had a cough for three weeks and had felt unwell for two months. With appropriate anti-tuberculous drug treatment he made a rapid and uneventful recovery.

Contacts—As well as his family and social contacts outside the hospital he had had close contact with the staff and patients in the paediatric and maternity departments and his colleagues in the medical staff mess.

Procedure—A committee, representative of the departments affected by the incident and involved in the tracing and examination of contacts, was called together and a plan of action drawn up. The parents and family doctors of the infants and children at risk were informed of the occurrence and the proposed procedure. They were asked to report any illness in the children.

Baby care unit—During the eight weeks before the diagnosis of tuberculosis, 83 babies had been through the baby care unit (table I). One infant had gone with its mother to the United States (see table I). If infected, most of these infants would still have been tuberculin negative. They were therefore given isoniazid 8 mg kg⁻¹ day⁻¹ for eight weeks. The home of each infant was visited by a health visitor to explain the circumstances, reassure the parents, supply the isoniazid and advise on its administration. Eight weeks later a visit was made to Heaf-test the infants. As there were no reactors we concluded that none of the babies had been infected or, if infected, the isoniazide treatment had suppressed the development of tuberculosis.

TABLE I—Child contacts of index case during October to November

Patients	No at risk	No examined	Procedure
Special care baby unit	83	82†	Insurance isoniazid followed by Heaf test
Paediatric ward	205	205	Heaf test*
Paediatric outpatients	318	318	Heaf test*

*Children considered to be susceptible, such as those suffering from diabetes and other chronic debilitating disease, were followed as outpatients and some were given BCG vaccination.

†One infant had gone with its mother to the United States.

Paediatric ward patients—As the period of infectivity was unknown, we assumed that those in the ward during the eight weeks before diagnosis were at greatest risk. A total of 205 children had been admitted to the ward during this period (table I). Those who had been in the ward during the first week of this eight-week period were Heaf-tested first. This allowed sufficient time for tuberculin sensitivity to develop. Those admitted in subsequent weeks were Heaf-tested serially at weekly intervals. The tests were done by experienced health visitors in the child's home or at the nearest local authority health clinic. Eight children who had left the district were traced and tested, three of them in the USA. Eight children given BCG vaccine shortly after birth gave grade 2 Heaf reactions. Three others gave grade 3 or 4 reactions and were seen at the chest clinic (table III). BCG vaccination was not given to the Heaf-negative children as we considered that there was no risk of tuberculosis infection in the homes.

Hospital staff contacts—For at least eight years all staff, except doctors working in the hospital and in contact with patients, have had chest radiographs, tuberculin tests, and, if necessary, were given BCG vaccine on appointment. Only those staff employed in the maternity and paediatric departments or who had regular duties in those depart-

ments were considered close contacts and advised chest radiography (table II). An initial chest radiograph was offered in January 1973 and a further examination was strongly advised in June, six months after the breaking of the contact. Of 413 such contacts 332 attended the first session and 219 the second. Only three domestics failed to attend either session. Another 185 other hospital staff, some of whom had been casual contacts, attended one or both sessions. No new disease was discovered.

TABLE II—Number of staff of paediatric, maternity, and other departments in contact during October and November and number examined

Staff	No of contacts	No radiographed at least once
Paediatric department:		
Nurses	53	53
Orderlies and domestics	12	12
Other	26	26
Maternity department:		
Nurses	201	201
Orderlies and domestics	64	61
Other	27	27
Medical staff	30	14
Other hospital staff all departments		185

Medical colleagues—Although widely advertised and given every opportunity of attending the hospital radiography department or the mass miniature radiography sessions at any time, only 13 of 30 medical colleagues of the index case attended (table II). They were principally those working in the paediatric and maternity departments.

Family and social contacts—Thirty-five family and social contacts outside the hospital were examined and most were Heaf-tested. No case of tuberculosis was found and nobody seemed to have been infected. The wife of the index patient had had BCG vaccination previously and their son was Heaf-negative and remained so for six weeks before receiving BCG vaccination.

Infected children—Three children developed tuberculosis (table III) and another, without evidence of tuberculosis, gave an ulcerating Heaf reaction. All four were inpatients in the three weeks before the index case was diagnosed and were suffering from disease known to be associated with depressed immunity. One child (case 1) aged 8 with an ulcerating Heaf-reaction was suffering from the nephrotic syndrome, and another child (case 2), aged 2, suffering from Down's syndrome gave a grade 3 Heaf-reaction. His chest radiograph showed bilateral disease and paratracheal gland enlargement. These two children received appropriate antituberculous drug treatment.

Two children, Heaf-negative at the initial testing, were subsequently found to have tuberculosis. One (case 3), aged 3, who was severely ill with lymphoblastic leukaemia and treated with the then current regimen of immunosuppressive and cytotoxic drugs (prednisone, daunorubicin, mercaptopurine, and vincristine) had a chest radiograph showing a typical primary tuberculosis. The fourth child (case 4), aged 6 and suffering from the nephrotic syndrome and Heaf-negative at the original testing, was admitted nine months later to another hospital in relapse. During the investigation she gave a "strongly positive" Mantoux reaction and her chest radiograph showed pleural changes on both sides. Treated with isoniazid and rifampicin daily and diuretics, she made a rapid and uneventful recovery.

No source of tuberculosis was found among any of the contacts of these children (table III). A brother of case 4 had been seen at the clinic two years before his sister's diagnosis because of a large Heaf reaction. He was found to be fit and as his brothers and sisters were all Heaf-negative no further action had been taken.

It was confirmed that another child (aged 8) who gave a grade 3 Heaf reaction had been given BCG vaccination soon after birth while

TABLE III—Details of child contacts infected with tuberculosis

Case No	Age (years)	Heaf test grade	Tuberculosis	Associated Disease	Home contacts	
					Siblings* Heaf tests	Parents chest x-ray films
1	8	4	Nil	Nephrotic syndrome	Older sister BCG at birth, younger sister negative	Normal
2	2	3	Lungs	Down's syndrome	Sister negative	Normal Heaf-negative
3	3	Nil	Lungs	Leukaemia	Brother negative	Mother normal Heaf-negative, father dead
4	7	Nil	Pleural (?disseminated)	Nephrosclerosis	6 Brothers and sisters negative, 1 brother grade 2 reaction	Normal

Chest radiographs of all parents and siblings were normal.

living in the Channel Islands. No source of infection was known or found among his contacts.

Discussion

In the past tuberculosis infection in hospital staff was common^{3,4} and the hospital is still a high risk area for tuberculosis infection for both patients⁵ and staff. Not uncommonly cases of tuberculosis enter the general wards of hospitals and go unrecognised until necropsy.⁶

Five new cases of pulmonary tuberculosis occurred in the staff of hospitals in Suffolk over 12 months in 1972-3; three doctors—the index case and two others in neighbouring hospitals, a nursing sister, and a necropsy attendant. At the same time the total new tuberculosis notifications in the surrounding population of 350 000 was 18. This experience cannot be an isolated incident despite the rarity of reports.² It is essential to protect the staff and maintain a careful watch for new cases of tuberculosis being introduced into hospitals.^{7,8}

One of the paediatric department staff infected four children with tuberculosis. All were inpatients during the three weeks before the disease was diagnosed. Although contact in the baby care unit was close and would favour droplet infection, no infant appears to have been infected. Isoniazid treatment may have suppressed the infection and prevented or delayed the development of tuberculin sensitivity. All four infected children were suffering from debilitating diseases, which made them more susceptible to tuberculosis. Such patients may be anergic to tuberculin so that the disease can be detected only by careful clinical observation. When tuberculosis infection is known to have been present child contacts, particularly those in a debilitated state, should be given insurance antituberculosis drugs.⁹

Most of the children and infants at risk had been discharged to their homes and only a minority would be followed at out-patient sessions. Recalling them would have created unnecessary anxiety. The Heaf-testing and isoniazid treatment were therefore done by health visitors calling at the home and under the family doctor. As these children were at no greater risk of future tuberculosis infection than those who had never been in hospital BCG vaccination was not given. Those attending hospital were given BCG vaccination at the discretion of the paediatrician.

Adult contacts are radiographed to discover the source of the infection or when the index case is infectious, the secondary cases. Two chest radiographic surveys are therefore often necessary—one as soon as possible, and the second after nine to 12 months. The public, even nurses and other hospital workers,

are anxious for immediate action and are unable to understand the reason for delay. When the interval is too great dispersal of the staff makes it difficult to trace the contacts and remoteness from the event dulls the anxiety and there is less enthusiasm to attend.

The poor attendance of the medical staff, after being granted every facility, cannot be due to a lack of understanding of the risks or unwillingness to co-operate but is probably due to preoccupation with their duties and an attitude exemplified by the old Scottish proverb "The smith's mare and the shoemaker's bairns are aye the worst shod." The solution would be for all grades of staff, including medical staff, to produce evidence of a clear chest radiograph before taking up duty, and annually thereafter. This control might well be undertaken by the staff health department as part of their overall supervision of the health of hospitals.

The successful tracings and examination of the different groups of contacts involved several departments and many people. Success was achieved by setting up a co-ordinating committee of the principal officers of the departments in which the infection occurred and those responsible for the detection and examination of the contacts. Inevitably there was some disruption of services. The overall cost was estimated at about £2000, or £2 for each contact examined.¹⁰ Early notification of general practitioners and the parents and a prepared statement to the press considerably relieved any anxiety that might have occurred.

The enthusiastic co-operation of the staff of all grades of the departments involved in the outbreak, particularly the health visitors, contributed greatly to the ease with which the survey was run and to its successful completion.

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A leaflet from a herbal products firm extols the virtues of elderberry and says that it is full of natural iron. Is there any justice in this claim?

Elderberry contains about 1.6 mg iron in 100 g. This is only a little more than the 1.1 mg in 100 g of white bread and about the same as the amount of iron in several other berries. To say that the elderberry is "full of iron" is of course ludicrous. The amount is equivalent to 1.6 ml of water in a 100-l flask or three drops of water in a 10-l flask. No one would then claim that the flask is "full" of water.

US Department of Agriculture, *Handbook No 8 Composition of Foods*, p 30. Washington, 1963.

Could prednisone or ACTH provocation of pyuria or bacteriuria be used in cases of suspected urinary tract infection in young children?

It is agreed that all boys with a proved urinary tract infection should be investigated by intravenous urography and micrurating cystography, as should girls with recurrent infections. Some authorities suggest that all girls should be investigated after their first infection, but the logical conclusion of this policy is to embark on uro-radiology in about 5% of all girls at some stage during childhood, which presents a formidable load to the radiological resources and is a considerable radiation hazard for the community. There is in general, therefore, no place for such radiological investigation of suspected urinary tract infection if it has not been adequately documented by urine culture, though other urinary symptoms, such as haematuria, demand

investigation in their own right. There has been little experience in the use of provocation tests in children, but the absence of pyuria does not exclude urinary tract infection, and there is unfortunately no escape from the chore of urine culture for the diagnosis of urinary tract infection. Nevertheless, the modern dip slide techniques have made these matters easier for the general practitioner.

A patient complains that she has blushed easily all her life but that in recent years this has become so bad that she now avoids people for fear of "colouring up." Is any treatment likely to be successful?

Most dermatologists are only too aware of this common problem. If the patient is not menopausal the history favours a psychogenic cause and treatment with a tranquilliser would be worth while. A full psychiatric assessment may also be rewarding. I have had no success with antihistamines and anticholinergics. Treatment with a placebo is justifiable if confidence can be instilled. Laboratory tests designed to exclude textbook causes of flushing should be considered, though a good history and thorough examination will often make further tests unnecessary. The causes include carcinoid syndrome, phaeochromocytoma, and Zollinger-Ellison syndrome, and alcohol-induced aldehyde syndrome. If there is still doubt then the levels of specific urinary metabolites such as 5-hydroxyindole acetic acid (5 HIAA) and 4 hydroxy-3-methoxy mandelic acid (HMA or VMA) may be measured.