relatively painless, thus obviating the need for a general anaesthetic and, in most cases, for any form of premedication. In consequence the procedure can be organized on an outpatient basis and the patient is not required to starve before coming to hospital. If she is working she need take only the day off, or if she has children their care while she is in hospital does not present the same problem as does an admission of 48-72 hours, which is required in many hospitals for a routine vaginal termination of pregnancy. It could be argued that this makes the whole process too easy for the patient, encouraging a careless attitude towards the need for contraception in the future. This has not been our experience to date. During the eight months the method has been used by us 250 outpatient terminations have been performed. With few exceptions we have been impressed by the fact that it is the dislike of having to request and then to go through with an abortion that is the major deterrent rather than whether or not the termination procedure itself is unpleasant. To some extent the fact that the patient is awake during the procedure seems to increase her sense of involvement and consequently the responsibility of her decision.

Our experience suggests that if it remains the policy for large numbers of legal abortions to be performed in National Health Service hospitals, then a small ward with an operating theatre similar to the one we have described is ideal for the purpose. The unit can also be used for most forms of minor gynaecological surgery.¹⁰ It has been reported that abortion clinics can operate successfully geographically separated from a hospital.⁸

Our experience is insufficient for us to comment except to say that the advantages in terms of the ready availability of expertise and facilities of incorporating such a unit in a general hospital are considerable.

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Clinical Problems

Diagnosis of Tuberculosis in a General Hospital

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Summary

In a survey of 71 new cases of tuberculosis diagnosed in a general hospital the average interval between admission and diagnosis of tuberculosis (the diagnostic interval) ranged between 10 days for intrathoracic tuberculosis and 20 days for genitourinary tuberculosis. The average diagnostic interval was 10.9 days when tuberculosis was included in the initial differential diagnosis, and 22.8 days when other diagnoses were made. Undue delay in diagnosis occurred in 17 patients (24%). In eight this was due to failure to include tuberculosis in the initial differential diagnosis. Earlier diagnosis might have saved three of the five patients who died.

In 21 patients (30%) a history of predisposing factors or associated illness was obtained. Ten of these had suffered from previous tuberculosis.

The vital factor in diagnosis of tuberculosis in general hospital patients is consideration of this condition in the diagnosis of any unexplained illness, especially where a history of previous tuberculosis or a recognized pre-disposing factor is obtained.

Introduction

Though the notification rate for new cases of tuberculosis has fallen sharply over the past 13 years the average number of new cases notified annually in Edinburgh (population about 500,000) for the years 1964 to 1968 inclusive was 246. Twenty-one per cent. of these were diagnosed in general hospitals. Such patients differ from those presenting for the first time at chest clinics in that the clinical features are often atypical and a higher proportion suffer from non-respiratory tuberculosis.

In general hospitals the junior medical staff are usually less alert to the possibility of tuberculosis in a diagnostic problem than those who work in specialized respiratory units. They have less experience of the appropriate investigations to be carried out and in the interpretation of the results. It might thus be expected that long delay in the diagnosis of tuberculosis would occur in some cases. For this reason a survey of all new cases of tuberculosis diagnosed in this hospital in the years 1963 to 1968 inclusive was carried out and the results are reported here.

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Patients

The survey included all patients in whom the diagnosis of active tuberculosis was made for the first time on or after admission to any department of the hospital, excluding the departments of radiotherapy, neurosurgery, and obstetrics. The age and sex of the 71 patients are given in Table I. There were 29 males and 42 females. Their ages ranged from 1½ to 82 years, with an average of 38 years. Thirteen (18%) were children under 14. Four of the patients were immigrants, two Asiatic and two European.

TABLE I—Age and Sex of Patients studied

Age (years)	M.	F.	Total
≤14	4	9	13
15-34	12	13	25
35-54	3	8	11
≥55	10	12	22
Total	29	42	71

The patients were divided according to the site of the tuberculous disease. The largest group was made up of patients with intrathoracic tuberculosis and comprised 41% of all the cases. These 29 patients consisted of 14 with postprimary pulmonary tuberculosis, 8 (all children) with primary pulmonary tuberculosis, 5 with pleural effusions, and 2 with tuberculous pericarditis. In the disseminated group there were four patients with miliary tuberculosis and five with tuberculous involvement of more than one organ. Of the patients with tuberculous lymphadenopathy all had enlarged cervical lymph nodes, and in one the axillary lymph nodes were also involved. The genitourinary group consisted of 12 patients with renal and five with genital tuberculosis. The four remaining patients were classified under the "miscellaneous" group. In two the disease involved bones and joints (in one a knee and in the other the spine); two had tuberculosis of the ileum and mesentery, and in one of these the caecum was also involved.

Results

The diagnostic interval was defined as the time elapsing between the first hospital admission and the date on which a firm diagnosis of tuberculosis was made. In most cases this was the day on which positive bacteriological or histological proof was received, but where this could not be obtained—for example, in primary pulmonary tuberculosis—the date on which anti-tuberculosis chemotherapy was started was used. Undue delay in diagnosis was defined as a diagnostic interval of more than 21 days or failure to diagnose tuberculosis during life.

Details of the diagnostic intervals in the four groups of patients are given in Table II. Even though five cases were diagnosed within 48 hours the average interval for intrathoracic cases was 10 days, and undue delay occurred in four of the 29 patients. In the disseminated group the interval could not be estimated in the two patients in whom the diagnosis was not made before death. The average diagnostic interval in the remaining seven cases was considerably longer than that in the intrathoracic cases. In the lymphadenopathy group the average interval was similar to that in the intrathoracic group but the range was smaller. The high diagnostic interval in the genitourinary group was partly due to delay in excision of involved organs in three cases (kidney, ovary, and epididymis respectively).

TABLE II—Time elapsing before Diagnosis in the Four Main Groups of Patients

Site and Extent	No. of Cases	Average Diagnostic Interval (days)	Range of Diagnostic Interval (days)	No. of Cases with Undue Delay in Diagnosis	No. of Cases Diagnosed within 48 Hours
Intrathoracic	29	10	<1-56	4	5
Disseminated	9	18 (7 cases)	4-36	4	0
Lymph node	12	11	4-25	2	0
Genitourinary	17	20	<1-114	4	1

The diagnostic interval exceeded 21 days in 15 cases, and in two the diagnosis was not made before death. The main components of this undue delay are shown in Table III. An important correctable factor was failure to include tuberculosis in the initial differential diagnosis, and this accounted for the undue delay in eight of the 17 cases. The importance of the initial differential diagnosis was further stressed by comparing the average diagnostic interval in patients where tuberculosis was initially considered and in those where it was excluded from the initial diagnosis (Table IV). This could be done in all but three cases in the four main groups, these being excluded because of lack of information in the case notes (one) or death before diagnosis (two). In the remainder the average interval was appreciably less in patients where active tuberculosis was thought to be a possible cause of symptoms. This difference was largest in the intrathoracic group.

TABLE III—Causes of Delay in Diagnosis in 17 Patients

	No. of Cases
Surgical excision and histological examination of specimens	7
Bacteriological culture	3
Inclusion of tuberculosis in the initial differential diagnosis	8
Confirmation of suspected tuberculosis due to modification of clinical features by corticosteroids	1

TABLE IV—Diagnostic Interval related to Initial Differential Diagnosis

	Tuberculosis Included		Tuberculosis Not Included	
	No. of Cases	Average Diagnostic Interval (days)	No. of Cases	Average Diagnostic Interval (days)
Intrathoracic cases	24	8.0	5	23.2
Other groups	24	13.9	11	22.6
Total	48	10.9	16	22.8

In 21 of the 71 patients (30%) predisposing or associated factors were present. Eleven (16%) were suffering from other chronic illnesses, including hepatic cirrhosis (two), haematological disorders (two), and ulcerative colitis, rheumatoid arthritis, diabetes mellitus, and Addison's disease (one each). Three of these patients were taking corticosteroid drugs, one for myelofibrosis, one for autoimmune haemolytic anaemia and thrombocytopenic purpura (Evans's syndrome), and one for ulcerative colitis. A history of previous manifestations of tuberculosis was obtained in 10 patients (14%)—in 6 of tuberculous lymphadenopathy, in 2 of tuberculous involvement of joints, in 1 of erythema nodosum, and in 1 of erythema induratum.

The investigative procedures which were most helpful in reaching the correct diagnosis were assessed for each group. In the 38 patients with disseminated or intrathoracic tuberculosis these were sputum examination (13), chest radiography (20), and tuberculin testing (13, of whom 11 were children). No cases were diagnosed by liver biopsy or bone marrow culture. In two patients a therapeutic trial of para-aminosalicylate and isoniazid was found to be of value.¹ The diagnosis was always made in the genitourinary cases by examination of the urine or of specimens obtained at operation, and in tuberculous lymphadenopathy by examination of the excised lymph nodes.

DEATHS

Details of the five patients who died are given in Table V. Tuberculosis was the main cause of death in four, and this might have been prevented by earlier diagnosis and treatment in three (Cases 2, 3, and 4).

In the three patients aged over 70 the presenting complaint was vague ill health rather than respiratory symptoms, though in all three involvement of the lungs was a major feature. The diagnosis of intra-abdominal malignant disease was made in each case but was confirmed in only one. Case 3 was an 18-month-old child who died from miliary tuberculosis and

TABLE V—Deaths in Patients with Tuberculosis, 1963-8

Case No.	Age and Sex	Presentation	Chest Radiography	Initial Diagnosis	Time between Diagnosis and Death (days)	Time between Admission and Death (days)	Necropsy Findings
1	73 F.	Fatigue, weight loss, and dyspnoea 5 months; haemoptysis 7 days	Diffuse mottling	Tuberculosis, intra-abdominal malignancy, diabetes	6	11	Nil
2	80 F.	Weakness, anorexia, and abdominal pain 6 weeks	Bilateral diffuse pulmonary abnormality, ? fibrosing alveolitis	Gastric carcinoma	Nil	10	T.B. R. lower lobe Miliary spread in lungs, spleen, and kidney
3	1½ F.	Lethargy 3 weeks, anorexia 1 week	Inflammatory changes R. lower zone	Upper respiratory tract infection	Nil	11	Miliary T.B. of lungs, spleen, liver and meninges
4	58 M.	Fever during corticosteroid therapy for Evans's syndrome 1 week	2 Mid-zone opacities L. lung	Tuberculosis, bacterial or fungal pneumonia	8	32	Miliary T.B. of lungs, adrenals, lymph nodes, kidneys, and bone marrow
5	71 M.	Weight loss, weakness, and exertional dyspnoea 1 year	Patchy consolidation R. upper lobe	Gastric carcinoma; pulmonary T.B., ? active	8	9	Gastric carcinoma. Active pulmonary T.B. — localized

tuberculous meningitis. Though the presence of meningitis was discovered five days after admission and antituberculous drugs were introduced four days later (three days before death) the exact diagnosis was not made until after death. Misleading results of investigations included a blood polymorphonuclear leucocytosis and a cerebrospinal polymorphonuclear pleocytosis, both of which may be present in the early acute stage of the disease. A tuberculin test using 5 tuberculin units of purified protein derivative was negative.

Case 4 developed a febrile illness while receiving 45 mg of prednisolone daily for Evans's syndrome. Chest radiography showed opacities in the left lung field. It was thought at first that these might be due to tuberculosis, but failure to confirm this by examination of a Ziehl-Neelsen film of sputum, coupled with appreciable growth of pneumococci and later monilia from sputum cultures, led to treatment with penicillin and nystatin. Corticosteroid therapy was probably responsible for his apparently good condition and the absence of noticeable pyrexia during the first two weeks after admission and for the rapid dissemination of tuberculosis thereafter. Severe gastrointestinal bleeding occurred during the last two weeks of life and contributed to the fatal outcome.

Discussion

The composition of this group of patients differed from that of chest hospital tuberculosis patients in three respects. Firstly, a higher proportion of patients (59%) had extrathoracic tuberculosis compared with that found in patients treated in an adjacent chest hospital during the same period (26%); secondly, there was a higher proportion of young and of female patients, partly due to the presence within the hospital of departments of paediatrics and gynaecology; and, thirdly, atypical presentations of tuberculosis were commoner, presumably because patients with more obvious manifestations of the disease were referred direct to chest clinics and hospitals.

The frequency of atypical presentations partly accounts for the high proportion of the general hospital patients in whom undue delay in diagnosis occurred (24%). In a similar study French and Farber² found an iatrogenic delay in diagnosis of more than two months in 37% of 52 patients later admitted to hospital with pulmonary tuberculosis. In these, however, the delay was caused by failure of the patient's doctor to arrange chest radiography, whereas in our cases the delay was largely due to failure in interpretation of radiographic and clinical information in hospital.

This investigation has shown that inclusion of tuberculosis in the initial differential diagnosis particularly influenced the speed of diagnosis in patients with intrathoracic disease. Here positive proof of the diagnosis rests heavily on specialized bacteriological examination of sputum, which must be specifically requested. All patients who have a persistent opacity anywhere in the lung fields should have the sputum examined for tubercle bacilli. In contrast lymph node and some cases of disseminated and genitourinary tuberculosis are diagnosed by

histological examination without the need to request any specialized techniques of examination. Nevertheless, it is essential that part of the excised specimen should be sent for bacteriological examination, as this will include estimation of the sensitivity of the organisms to antituberculosis drugs.

A history of previous manifestations of tuberculosis should always raise the suspicion that the illness under investigation is due to a recurrence of the disease. Of the 10 patients previously affected eight had been infected before the era of effective chemotherapy. The risk of recurrence in such patients was stressed by Keers³ with reference to tuberculosis in the elderly. Other recognized predisposing factors in this series were corticosteroid therapy (three), alcoholic cirrhosis (two), and diabetes mellitus (one).

Only four of the 71 patients (6%) were immigrants, which reflects their low concentration in this region. In contrast 16.5% of notifications of tuberculosis in England and Wales during a three-month period in 1965 occurred in immigrants, who then formed 4% of the population.⁴

Three of the five patients who died were over 70. In each case a diagnosis of intra-abdominal malignant disease was made but in only one was this confirmed. The danger of diagnosing malignant disease without histological proof in the elderly and so overlooking tuberculosis has also been stressed by a recent survey of deaths from tuberculosis.⁵

Of the five patients who died three might have survived with earlier diagnosis (Cases 2, 3, and 4). In Case 4 corticosteroids so modified the early course of the illness that an initial diagnosis of tuberculosis was discarded in favour of one of non-tuberculous pulmonary infection. It is important to remember that these drugs not only facilitate the development of tuberculosis but may also suppress the clinical manifestations, thus delaying diagnosis until a late stage.

The main error in Cases 2 and 3 was failure to consider tuberculosis in the initial differential diagnosis and to institute antituberculosis treatment without waiting for bacteriological or histological proof. Despite the decline in incidence of tuberculous infection it must always be included in the initial differential diagnosis of unexplained illness, especially in the elderly, in children, in immigrants, and in patients with a recognized predisposing illness or on corticosteroid drugs.

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