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ABDOMINAL TUBERCULOSIS IN EDINBURGH
1965 - 1979

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INTRODUCTION

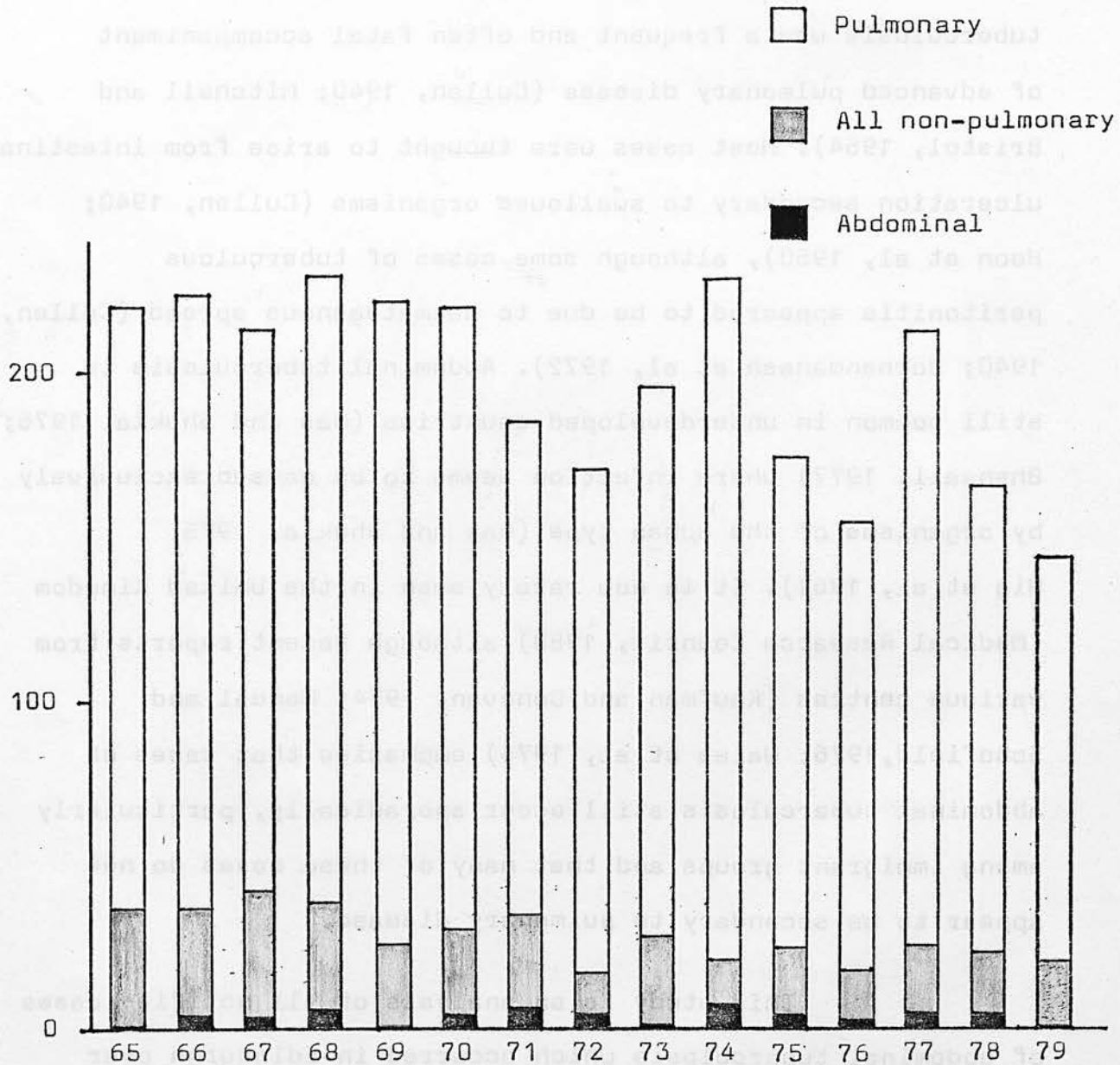
Although the incidence of tuberculosis in the United Kingdom is falling (Grange, 1979), pulmonary tuberculosis is by no means a rare disease, particularly in areas with a high influx of immigrants (British Thoracic Association, 1978; Medical Research Council, 1980). Prior to the advent of anti-tuberculous chemotherapy, abdominal tuberculosis was a frequent and often fatal accompaniment of advanced pulmonary disease (Cullen, 1940; Mitchell and Bristol, 1954). Most cases were thought to arise from intestinal ulceration secondary to swallowed organisms (Cullen, 1940; Hoon et al, 1950), although some cases of tuberculous peritonitis appeared to be due to haematogenous spread (Cullen, 1940; Borhanmanesh et al, 1972). Abdominal tuberculosis is still common in underdeveloped countries (Das and Shukla, 1976; Bhansali, 1977) where infection seems to be caused exclusively by organisms of the human type (Das and Shukla, 1975; Wig et al, 1961). It is now rarely seen in the United Kingdom (Medical Research Council, 1980) although recent reports from various centres (Kaufman and Donovan, 1974; Mandal and Schofield, 1976; Wales et al, 1976) emphasise that cases of abdominal tuberculosis still occur sporadically, particularly among immigrant groups and that many of these cases do not appear to be secondary to pulmonary disease.

This study is an analysis of all notified cases of abdominal tuberculosis which occurred in Edinburgh over a fifteen year period.

Figure 1.

NOTIFIED CASES OF TUBERCULOSIS FROM EDINBURGH AREA

1965 - 1979



PATIENTS AND METHODS

The patients included in this analysis were all those cases of abdominal tuberculosis notified to the Royal Victoria Dispensary, Edinburgh for contact tracing and follow up between the years 1965 and 1979 inclusively. Permission was obtained from all the Consultant Physicians responsible for individual patients prior to detailed scrutiny of the case records.

The diagnosis of tuberculosis was based on one or more of the following criteria.

- a) Demonstration of acid and alcohol fast bacilli in pus or tissue obtained at biopsy, or growth of the organism in culture or on guinea pig inoculation.
- b) Histological appearance of typical caseating granulomata in tissue obtained surgically or at post-mortem.
- c) A rapid and sustained response to anti-tuberculous chemotherapy in cases lacking other confirmatory evidence of the disease but in whom the clinical features, history and results of investigations, including Mantoux testing, were highly suggestive of tuberculosis.

Any notified patients in whom the diagnosis remained in any doubt were excluded from the final analysis.

TABLE 1 - Classification of cases of abdominal tuberculosis notified to the Royal Victoria Dispensary, Edinburgh
1965 - 1979

<u>Site</u>	<u>Number</u>
INTRA-ABDOMINAL	39
Intestinal	20
Small intestine	4
Ileo-caecal region	15
Colon	1
Other intra-abdominal sites	16
Lymph nodes	5
Peritoneum	11
Possible enteritis associated with open pulmonary TB (AAFB positive stool)*	3
ANO-RECTAL	9
TOTAL	48

* Excluded from further analysis

RESULTS

During the fifteen year period under study, 48 cases of abdominal tuberculosis were notified from the Edinburgh area. Its annual incidence is compared with that of pulmonary tuberculosis and all forms of non-pulmonary disease in the same population (Figure 1).

The patients fell into two main groups; 39 cases of intra-abdominal tuberculosis and 9 cases of ano-rectal disease (table 1). These groups will be considered ^aseperately.

INTRA-ABDOMINAL TUBERCULOSIS

The 39 patients with tuberculous disease within the abdomen could be subdivided according to the principal site of the disease (table 1). Twenty patients had confirmed intestinal tuberculosis, the majority with lesions in the region of the ileo-caecal junction. There were 16 patients with no confirmed intestinal lesion in whom the disease was either confined to the mesenteric and/or coeliac lymph nodes or was found to diffusely involve the peritoneum.

There were 3 additional patients presenting with sputum-positive pulmonary tuberculosis who had acid and alcohol fast bacilli present in their stools. These three had symptoms attributable to gastro-intestinal disease but the site of a gastro-intestinal lesion was not established. As no further evidence of intestinal disease was available, they are excluded from further analysis and the data based on the remaining 36 cases.

TABLE 2 - Tuberculous background of patients with
intra-abdominal tuberculosis

		<u>n=36</u>
Current active tuberculosis		7
Pulmonary	5	
Other	2	
Past history of tuberculosis		7
Pulmonary	4	
Cervical adenitis	3	
Chest X-ray evidence of old TB		2
Close family or contact history		6
Tuberculin positive on screening*		4
None		16

* All Edinburgh schoolchildren born after 1940

Characteristics of Patients

The patients ranged in age from 15 to 89 years with the following distribution:-

Age in years	<u>Age at presentation</u>			
	<25	25-44	45-64	>65
Number of patients	6	12	5	13

Females outnumbered males by 23 to 13. Seven of the patients were Asian immigrants, the duration of their stay in the United Kingdom having ranged from 2 to 15 years. The remaining 29 patients were Caucasian and born in the United Kingdom. An analysis of social class was not possible because of the proportion of patients described as "housewife" whose husband's occupation was not recorded. However, there was a predominance of patients from the middle classes and none with an obvious background of social deprivation or institutionalisation. Four patients had coincidental malignant disease which, in three, was situated in the bowel and this caused some diagnostic confusion.

Background of tuberculosis

Sixteen of the 36 patients with intra-abdominal (44%) had no apparent past or present history of tuberculosis or of contact with the disease (Table 2). Seven had currently active tuberculosis in extra-abdominal sites, four of whom were cases of tuberculous peritonitis. Seven patients gave a definite past history of tuberculosis and a further two had calcified radiological pulmonary opacities. Six had a history of close contact with the disease, with or without other positive features.

TABLE 3 - Presenting symptoms in patients with intra-abdominal tuberculosis

	Intestine n=20	Lymph nodes & peritoneum n=12*	All n=32
Pain	15	9	24 (75) ⁺
Diarrhoea	10	4	14 (44)
Vomiting	8	5	13 (41)
Distension	4	3	7 (22)
Diarrhoea & constipation	3	0	3 (9)
Constipation	0	2	2 (6)
No abdominal symptoms	0	2	2 (6)
Weight loss	10	10	20 (63)
Fever	6	5	11 (34)

* Excluding 3 patients with coincidental malignant disease and one in whom the data was not available.

⁺ Figure in brackets indicates percentage.

Additional information was available for the seven patients born after 1940 who had been offered tuberculin testing at school. One had refused screening despite a strong family history of the disease and BCG vaccine had been given to two who were tuberculin negative. Four were tuberculin positive but had no radiological evidence of pulmonary tuberculosis.

Clinical features

Abdominal pain was the commonest presenting symptom (table 3), followed by diarrhoea and vomiting. Symptoms were similar regardless of the site of the disease although systemic symptoms were more frequent in the group with tuberculous peritonitis.

The duration of symptoms prior to diagnosis (table 4) was dependent on the severity of the systemic upset and the nature of the symptoms, and an acute presentation was unusual. Several patients with mechanical complications of intestinal disease had symptoms present for ten years or longer.

Abnormal physical signs in the abdomen (table 5) were absent in 6 cases. In the remainder, the commonest findings were variable degrees of tenderness, usually right sided, and a palpable mass. The latter represented either a hypertrophic ileocaecal lesion or a mass of enlarged lymph nodes. Three patients had demonstrable ascites and another three had non-gaseous distention which, in one case, was described as 'doughy'.

TABLE 4 - Duration of abdominal symptoms prior to diagnosis

	Intestine n=20	Lymph nodes & peritoneum n=10	All n=30
Less than 1 week	2	1	3
1 week - 6 months	3	6	9
6 months - 2 years	3	3	6
2 - 10 years	8	0	8
More than 10 years	4	0	4

TABLE 5 - Physical signs on abdominal examination *

	Site of intra-abdominal TB		
	Intestine n=20	Peritoneum n=9	Lymph nodes n=3
Rt sided tenderness	5	3	0
Rt sided mass	7	1	0
Central mass	0	2	2
Obstruction	5	1	0
Ascites	1	2	0
Non-gaseous distension	0	3	0
No abnormality	4	1	1

* Excluding patients with coincidental malignancy.

Investigations

a) Tuberculin testing

Thirteen patients did not have a formal tuberculin test. Of the 23 who were tested, five had a negative result. In these, the diagnosis of tuberculosis was in no doubt, having been confirmed bacteriologically in four cases and histologically in the fifth. In another five patients a Mantoux test was initially negative at a dilution of 1 in 10,000 but on repeat at a dilution of 1 in 1000 or on Tine testing, a positive result was obtained.

b) Erythrocyte sedimentation rate

This was performed in 33 patients. In only six patients was it less than 10mm/hour. In 16 it was between 10 and 50mm/hour and eleven had a result greater than 50mm/hour. Two of the latter had coexisting malignant disease.

c) White cell count

Results were available for all the patients but no pattern emerged. The majority of results were normal.

d) Radiology

Plain X-ray examination was diagnostically helpful in two cases by demonstrating lymph node calcification. Of the 20 patients with proven intestinal disease, 15 were investigated by barium follow through or barium enema or both. The highest incidence of demonstrated abnormalities was in those eight patients in whom both these investigations were performed. All eight had a demonstrable abnormality which was present in both studies in six cases, in the enema only in one and in the follow through only in one. Abnormalities

TABLE 6 - Surgical or other procedures leading to diagnosis

	Intestine n=20	Lymph nodes & peritoneum n=16	All n=36
Laparotomy & resection	10	3	13
Laparotomy & biopsy	1	5	6
Laparoscopy & biopsy	0	3	3
Paracentesis	0	1	1
Other surgical	1	1	2
Post mortem	4	1	5
Clinical alone	4	2	6

were demonstrated in only three out of seven patients investigated by a single barium study.

Diagnosis

The diagnosis of tuberculosis was based on the demonstration of tubercle bacilli on staining or on culture in nine patients and on histological criteria in 21 patients. In the remaining six, it was entirely clinical, based in particular on a prompt and sustained response to anti-tuberculous chemotherapy.

In 25 patients the final diagnosis was reached following a surgical procedure (table 6). In another five tuberculosis was unsuspected until post-mortem examination. Nineteen patients underwent laparotomy but more minor procedures (paracentesis or laparoscopy) were positive in four cases of tuberculous peritonitis. One patient who initially had a diagnostic paracentesis performed required emergency laparotomy because of bowel perforation, due to the presence of multiple adhesions. In one patient peritoneal tubercles were unexpectedly found at a routine hernia repair although, in retrospect, this man had a long history of vague ill health and low grade pyrexia.

Laparotomy was carried out as an emergency, during the initial presentation, in nine cases (table 7). In four, subacute obstruction complicated a chronic presentation of pain and disorder of bowel function and in the remaining six the nature of the underlying pathology was uncertain, malignant disease being suspected in four. Crohn's disease had been considered to be the diagnosis in the four patients with a long history of intestinal disorders.

TABLE 7 - Indications for laparotomy

ACUTE PRESENTATION	9
Suspected appendicitis	4
Acute obstruction	3
Suspected empyema of gall bladder	1
Perforated bowel at paracentesis	1
SUBACUTE OR CHRONIC PRESENTATION	10
Subacute obstruction	4
Abdominal mass	2
Abdominal pain	2
Malignancy suspected	2
TOTAL	19

Outcome

Three of the five patients in whom tuberculosis was unsuspected until post-mortem, were considered to have died from the disease. The other two died from other conditions but, in retrospect, the tuberculosis had probably contributed to their general ill-health.

All the other patients received triple chemotherapy. Six of these are known to have died from other unrelated conditions and the remainder were well until the completion of follow up or to date. One patient had symptoms of malabsorption following extensive ileal resection and the patient who required laparotomy following bowel perforation at paracentesis initially developed a faecal fistula post-operatively. His subsequent progress was excellent. The three patients with intra-abdominal malignancy all died of their malignant disease and at their initial laparotomy, biopsy of the lymph node masses had shown the typical appearances of tuberculosis. It was only when their condition failed to improve with chemotherapy that this diagnosis was doubted.

ANO-RECTAL TUBERCULOSIS

Eleven cases of ano-rectal tuberculosis were originally notified but, after scrutiny of the records, two were excluded as it was felt that there was insufficient evidence to support the diagnosis. None of the patients had evidence of tuberculous disease in the abdomen.

Characteristics of patients

There were 6 males and 3 females, with an age range of 18 to 67 years. One of the patients was an

Asian immigrant who had lived in Scotland for twenty years. Three of the patients came from poor social backgrounds or had a history of alcohol abuse.

Background of tuberculosis

In contrast to the patients with intra-abdominal tuberculosis, only one patient had no apparent past or present history of tuberculosis or of contact with the disease. However, in her case, the history was incomplete as she died soon after the diagnosis was made, a chest X-ray was not available and the relatives refused permission for a post-mortem. Five of the nine patients had current active pulmonary tuberculosis, one had a strong family history of tuberculosis as well as a history of Mantoux conversion in childhood and the other two had calcified foci visible on chest X-ray.

Presentation and diagnosis

Three patients, including the one who died, presented acutely with a peri-anal or ischio-rectal abscess from which acid and alcohol fast bacilli were seen in direct smears of the pus obtained at discharge. In five patients, diagnosis was based on the presence of a persisting fistula-in-ano for between three months and four years, together with a past or present history of pulmonary tuberculosis and a complete cure following chemotherapy.

Unfortunately, even in those patients who had undergone surgery on several occasions prior to diagnosis, material was not always submitted for histological confirmation of the diagnosis. Even in those for whom such an examination was performed, the appearances were always non-specific.

DISCUSSION

Tuberculosis continues to be a problem which, in Edinburgh, has not declined significantly over the past fifteen years. Compared with pulmonary disease, abdominal tuberculosis is uncommon but it still carries a mortality and is a cause of prolonged morbidity.

Unlike other centres in the United Kingdom, where abdominal tuberculosis is largely a disease of the immigrant population (Howell and Knapton, 1964; Kaufman and Donovan, 1974; Mandal and Schofield, 1974), Edinburgh has comparatively few immigrants and the patients in this study were mainly derived from the native population.

In contrast with pulmonary tuberculosis which is more frequent among middle aged and elderly males (Medical Research Council, 1980), especially those from socially deprived groups (Lancet, 1978), the patients in the present series with abdominal tuberculosis were predominantly female and from the middle classes. The lack of any apparent pulmonary disease in almost half the patients in this and other series (Kaufman and Donovan, 1974; Mandal and Schofield, 1976; Schulze et al, 1977) differs markedly from the situation in the pre-chemotherapy era (Hoon et al, 1950; Paustian and Brockus, 1959) and suggests that some are primary intestinal infections.

The lack of any tuberculous history in many patients, together with the varied and non-specific clinical picture, made diagnosis difficult and tuberculosis was often

not suspected. Clinically and radiologically (Hoon et al, 1950; Gershon-Cohen and Kremens, 1954) it is almost impossible to distinguish intestinal tuberculosis from Crohn's disease, which is now more common in Western society. Indeed the differentiation of the two conditions even on histological grounds can be extremely difficult (Wig et al, 1961; Tandon and Prakash, 1972).

Mantoux tests were negative in five patients in this series and other authors report similar findings (Bhansali, 1977; Mandal and Schofield, 1976). However, some of these may be due to technical error in performing or interpreting the test or failing to repeat it at a lower dilution if an initial negative result is obtained at a dilution of 1 in 10,000.

The other important condition which must be differentiated from abdominal tuberculosis is malignant disease. There were three patients in this series with intra-abdominal malignancy co-existing with active tuberculous lymph nodes. In two of these the presence of malignant disease was not diagnosed at the initial laparotomy, biopsies of nodes only and not of the main tumour mass having been taken.

The majority of the patients were diagnosed at or following laparotomy and this procedure carried low morbidity compared with the results of surgery from the pre-chemotherapy era when chronic fistula formation was common. It is likely that laparotomy will continue to be the main method of diagnosis and indeed allows surgical resection of ileo-caecal disease which combined with chemotherapy gives better results than chemotherapy alone (Abrams and Holden, 1964; Byrom and Mann, 1969;

Howell and Knapton, 1964). In non-intestinal disease it may be impossible to reach a diagnosis by any other means.

Compared with the cases of intra-abdominal tuberculosis, we found a much greater association between ano-rectal tuberculosis and pulmonary tuberculosis and it seems likely that most, if not all these lesions were due to swallowed organisms. Histological proof of tuberculosis was unfortunately lacking in most of these patients but it seems unlikely that the pulmonary infection was incidental.

The significance of tuberculous organisms in the stools in cases of open tuberculosis is unclear but is not thought to be diagnostic of intestinal involvement (Hoon et al, 1950). A high incidence of gastro-intestinal ulceration in sputum-positive patients was reported in the past (Cullen, 1940; Mitchell & Bristol, 1954) but the three patients who fell into this category in this series were not investigated by barium radiological studies or endoscopy and thus were excluded from the subsequent analysis. In any case, such patients do not present a diagnostic problem unless the pulmonary pathology is overlooked.

Abdominal tuberculosis will probably continue to be under-diagnosed due to its non-specific clinical picture often with the absence of a definite tuberculous history. However, one should be at least aware that it is not confined to immigrants or the socially deprived sections of our society.

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