Abdominal tuberculosis in East Birmingham – a 16 year study

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Summary: Abdominal tuberculosis, although rare, occurs mainly in immigrants from the Indian sub-continent. Such people comprise 13.5% of our local population and contributed 90% of a series of 72 patients presenting in the last 16 years; a local disease incidence of 1:6000 for Asian immigrants.

Men and women were equally affected, but on average women were much younger. Diagnosis was made from one month to 10 years after immigration. No clinical feature was diagnostic, but abdominal pain, night sweats and weight loss occurred in more than half the patients. The erythrocyte sedimentation rate (ESR) was elevated in 95% and no patient tested had a negative Mantoux test. In 20 patients diagnosis was by clinical suspicion and response to therapeutic trial. In 52, including 39 who had a laparotomy, histological and culture material was obtained but these patients fared no better. Only one organism was resistant (to streptomycin) and rapid response to chemotherapy was the rule. Successful outcome was not related to the type of presentation, operative findings or specific chemotherapeutic agents.

We would suggest that in Asians presenting with difficult-to-diagnose abdominal symptoms accompanied by malaise, raised ESR and a positive Mantoux test, a therapeutic trial of anti-tuberculous therapy should precede diagnostic laparotomy.

Introduction

Abdominal tuberculosis, a condition frequently encountered in the era before effective control of bovine tuberculosis, has become something of a rarity, infrequently seen by many surgeons. In Britain, areas with large immigrant populations, especially from the Indian sub-continent, often have a high incidence of tuberculosis^{1,2,3} and can, therefore, offer special experience in this condition. This study presents the results of a retrospective analysis of patients with abdominal tuberculosis admitted to the East Birmingham Hospital over a 16 year period 1969–1986. The hospital serves a population of more than 211,000 and immigrants from the Indian sub-continent represent 13.5% of this total.^{4,5}

Materials and methods

The diagnostic criteria used for inclusion into this study were: (1) growth of *Mycobacterium tuberculosis*; (2) demonstration of Ziehl-Nielsen (ZN) staining acid-alcohol fast bacilli (AAFB) in pathological specimens; (3) demonstration of florid caseating granulomata in specimens or (4) clinical response to specific anti-tuberculous therapy.

Information was available on 77 patients identified as having been treated for abdominal tuberculosis at East Birmingham during the period 1969 to early 1986. Only 72 patients satisfied at least one of these criteria and these 72 patients constitute the study.

Results

There was a virtually equal sex ratio – 34 males:38 females, but the average age of the sub-groups differed markedly, being 42.5 years (7–90) for males and 29 (11–83) for females (range in brackets).

Sixty five patients (90%) came from the Indian sub-continent but only 4 (5%) were Caucasian and 3 (5%) West Indian in origin. Excluding the eleven (15%) patients born in the United Kingdom and 9 (12%) for whom no information was available, the average time in the country prior to diagnosis was 5 years 2 months (range 1 month–10 years).

The various clinical features noted are listed in Table I. Only abdominal pain, night sweats and weight loss were present in more than 50% of patients. Active pulmonary tuberculosis was noted in 13 patients including 2 patients who died shortly after admission with widespread tuberculosis. Eight patients had previously been treated for pulmonary tuberculosis. One patient had suspected but unproven genitourinary tuberculosis. Tuberculosis had been diagnosed

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Table I Clinical features in 72 patients with abdominal tuberculosis (TB)

	No. of patients	
Abdominal pain	62	(86%)
Night sweats	53	(74%)
Weight loss	52	(72%)
Vomiting	26	(36%)
Ascites	24	(33%)
Lymphadenopathy	23	(32%)
Familial TB	23	(32%)
Pulmonary TB	21	(29%)
Obstruction (acute/chronic)	18	(25%)
Abdominal mass	18	(25%)

and treated within the immediate family of 23 of the patients in the study.

A raised ESR on admission was found in 57 (95%) of the patients who had this investigation – average value of 46 mm/h. A haemoglobin of under 11.1 g/dl was noted in 30% of males and under 10.1 g/dl in 41% of females. A strongly positive Mantoux test was found in 51 patients (weakly positive in 3 patients, not done in 18).

Gastrointestinal tract barium X-ray studies were a common investigative procedure. Highly suggestive findings included multiple strictures, and a distorted caecum or terminal ileum (Table II). A lower diagnostic yield was obtained using barium enema than barium meal and follow-through – frequently because of either poor bowel preparation or inability to visualize the caecum/terminal ileum.

Liver biopsy yielded the diagnosis in three of nine patients. Peritoneal biopsy was diagnostic in the two cases examined by this method and extra-abdominal lymph node biopsy showed the presence of AAFB in three of four cases.

The following investigations were always unhelpful (number of cases in brackets), sigmoidoscopy and biopsy (5), intravenous pyelogram (4), rectal biopsy (2) and computed tomography (CT) scan (1).

Diagnosis by clinical suspicion alone was made in 20

patients. In the remaining 52 a varying combination of positive culture, presence of AAFB or typical histological appearances were used. Growth of the organism was achieved in 24 of the patients (Table III), all of the *Mycobacterium tuberculosis hominis* strain except one patient who grew the Afro-Asian strain of bovine tuberculosis. In only half of these patients with positive cultures were ZN bacteria, seen in pathological specimens. Similarly in the 28 patients who had AAFB seen in an examination of any pathological material a positive culture was obtained in only 12 (Table III).

Management

Forty three patients underwent laparotomy before diagnosis and subsequent treatment with specific anti-tuberculous therapy and the operative procedures carried out are detailed in Table IV. The findings at operation were of tubercular peritonitis – miliary white nodules uniformly spread throughout the peritoneal cavity in 18 patients. Ileocaecal involvement as the major site of tuberculous infection occurred in 12 patients and fixed bowel and/or matted mesenteric lymph nodes were found in seven patients. Two patients had tuberculous abscesses drained. There were four patients in whom tuberculosis was an incidental post-operative finding. One of these patients had an ileo-panproctocolectomy for ulcerative colitis but ZN stained bacteria were subsequently found in the mesenteric lymph nodes.

Of the remaining 29 non-operative patients, 27 were healed by drug therapy alone. Within this group the diagnosis was made by clinical suspicion and barium studies in 11, and clinical suspicion alone in nine. Clinical suspicion was based upon a varied combination of the presenting symptoms, invariably associated with either ascites or a palpable abdominal mass.

Prior to therapy, growth of AAFB was achieved in seven patients. In two moribund patients the diagnosis was confirmed at post-mortem. In all other cases standard current anti-tuberculous chemotherapy was instituted, with only one case of streptomycin resistance occurring. Patients treated earlier in the study tended to be treated for longer periods – up to 26 months. Patients treated over the last 8 years have, in general, received a shorter course of chemotherapy – 12 to 18 months – broadly in line with recommendations by Cooke.²²

There was one post-operative death – secondary to haemorrhagic pancreatitis. Two of the four patients who had prolonged post-operative ileus required total parenteral nutrition. There was one ileal anastomotic leak, one patient had a chest infection and two wound infections were noted. Late post-operative complications included one patient with sub-acute adhesive

Table II Results of barium contrast studies in patients with abdominal tuberculosis

	Barium enema	Barium meal and follow-through
Highly suggestive of tuberculosis	8	11
Possibility of tuberculosis	4	1
No abnormality	5	1

Table III Comparison showing the diagnostic frequency of differing methods used in the demonstration of tuberculosis

	<i>Growth + ve</i> 12	<i>Growth - ve</i> 16
ZN staining positive		
	<i>ZN stain + ve</i>	<i>ZN stain - ve</i>
Microbacterial growth achieved	12	12
Pathological demonstration	23	21

obstruction and one patient who developed actinomycosis in the abscess draining tract. Five cases of mild drug sensitivity occurred and compliance was a problem in three patients. We still have eight patients currently under treatment. In all patients a therapeutic response occurred rapidly once specific chemotherapy had been instigated.

Discussion

This series reaffirms that abdominal tuberculosis occurs predominantly within the Asian sub-population.^{2,6,7} The local disease incidence in East Birmingham is 1:6000, which is less than half that reported from Blackburn in 1985.⁸ However, the disease does occur within the indigenous population^{9,10} and one of the patients in this series who died was white.

The prolonged period of residence prior to diagnosis is not unusual^{2,11} but the large age differences between the sexes which we found has not previously been reported. We are unable to explain this finding. Sex ratios in favour of males¹⁰ and females¹² have been reported, but our results are very similar to a large study by Klimach & Ormerod.⁸

The non-specific nature of the common presenting symptoms demands a high index of suspicion and a degree of clinical acumen for accurate diagnosis,

especially as treatment with specific anti-tuberculous therapy can frequently obviate the need for laparotomy. Fever, abdominal pain and weight loss occur commonly, but the incidence of such contributory signs as ascites or abdominal mass is much lower.

In contrast to other studies,^{13,14} barium meal and follow-through examination was the best diagnostic test, demonstrating bowel lesions highly suggestive of tuberculosis in 84% of cases. While not being conclusive evidence for tuberculosis, the incidence of Crohn's disease in the Asian/African immigrant population is low^{8,14} which allows greater confidence to be placed upon bowel abnormalities demonstrated, especially when occurring in conjunction with a positive Mantoux test. No abnormality was demonstrated on CT scan, in contrast to a recent evaluation of CT scans in abdominal tuberculosis.¹⁵

Growth of *Mycobacterium tuberculosis* is the ultimate proof of diagnosis. Stool cultures for tuberculosis were uniformly unsuccessful, although two cases of co-incidental worm infections, with up to four different simultaneous infestations, were noted. Gastric washings were positive in one case but could similarly reflect ingested infected sputum. The majority of cases of successful bacterial growth were achieved with laparotomy specimens.

The necessity for simultaneous culture, staining and pathological inspection of specimens is demonstrated by the high incidence of positive findings occurring in specimens reported as negative by other means. The identification rate for the tubercle bacillus was 56%. Bastani *et al.*¹⁶ noted similar identification rates of 34–67% in a review article and Findlay *et al.*² also successfully identified the organism in up to 56% of cases.

Blind peritoneal biopsy has been advocated in patients with ascites^{17,18} and positive results were obtained in both patients investigated by this means. However, in patients with ascites, laparoscopy can be safely practised and allows visual examination of peritoneal seedlings and direct biopsy is therefore possible. Should laparoscopy be contraindicated, the role of diagnostic laparotomy in abdominal tuberculosis remains a vexed question.^{13,16} Although emphasis has been placed upon the differing types of abdominal tuberculosis, such as enteritis, peritonitis,

Table IV Operative procedures

Laparotomy and biopsy	4
Laparotomy alone	1
and biopsy	18
and biopsy/appendicectomy	5
and biopsy/splenectomy	1
right hemicolectomy	4
distal ileal resection	3
ileal stricture resection	1
abscess drainage	2
Incidental findings post operation	
appendicectomy	1
cholecystectomy	1
Hartman's procedure	1
Ileo-panproctocolectomy	1

plastic,^{19,20} the successful outcome of the patients detailed here was independent of the operative findings. Moreover, resection of bowel during a laparotomy should be reserved for cases where obstruction has occurred, since resolution of X-ray demonstrable strictures took place in two patients in this series.

Nineteen percent of patients presented with an acute abdomen and an urgent laparotomy was clearly indicated. However, since abdominal symptoms and

signs resolve rapidly after a clinical trial independent of type or duration of anti-tuberculous therapy, the frequency of laparotomy noted in British series^{2,7,21} could possibly be reduced. We believe laparotomy should be reserved for patients with obstructive symptoms or those in whom a more serious diagnosis must be excluded. This semi-conservative approach is particularly applicable to the Asian population, where the incidence of tuberculosis is higher and in whom symptoms tend to be more florid.

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