

Abdominal Tuberculosis: A Presumptive Diagnosis

M Ramanathan, S Wahinuddin, E Safari, S P Sellaiah

ABSTRACT

Background: Abdominal tuberculosis (TB) is common. But the diagnosis of abdominal TB is fraught with difficulties as it is often not possible to get a microbiological confirmation of the infection. We therefore undertook this study to highlight those pertinent clinical and laboratory features which would enable one to make a provisional diagnosis of abdominal TB early, to pave way for a trial of anti-tuberculosis chemotherapy.

Method: This is a retrospective study of 12 patients treated for abdominal TB in our department over a period of 2 years.

Findings: Seven of the patients suffered from chronic diarrhoea for periods ranging from 4 weeks to 12 months. Four patients had progressive abdominal distension (ascites). The last patient came in with multiple abdominal swellings. Seven patients had clinical and biochemical features of malabsorption. Another 9 patients also had persistent pyrexia. The ascitic fluid was exudative in the 4 patients mentioned earlier.

A definitive diagnosis could not be established in any of these patients. The diagnosis of abdominal TB was thus one of exclusion in these patients who showed prompt response to anti-tuberculosis therapy.

Conclusion: Our study justifies a trial of anti-TB chemotherapy in TB endemic areas in the following clinical situations: (a) patients with chronic diarrhoea of unknown aetiology and (b) patients with exudative ascitic fluid, after all other possible causes, have been excluded. A prompt response to anti-TB therapy should be accepted as sufficient ground for the diagnosis of abdominal TB even when histopathological or microbiological confirmation of the disease is not possible. Our study reflects the experience of other workers from Third World countries.

Keywords: intestinal tuberculosis, tuberculosis peritonitis, ascites, chronic diarrhoea

INTRODUCTION

Abdominal TB is common. It is being seen with increasing frequency, both in developed as well as developing countries⁽¹⁻³⁾. The diagnosis of abdominal TB however, can be difficult at times, in view of its protean manifestations. The clinical features of

abdominal TB are vague and non-specific. The usual laboratory investigations and barium studies are often not helpful⁽⁴⁾. Although the Mantoux test is freely available, its value in the diagnosis of active TB remains uncertain.

Thus, unless one entertains the possibility of TB in abdominal disorders, it can easily be missed.

We undertook this retrospective study to highlight those pertinent clinical and laboratory features which would enable a clinician to focus on the possibility of abdominal TB early, to pave way for a trial of anti-tuberculosis chemotherapy.

PATIENTS AND METHOD

The case notes of 12 patients treated for abdominal TB from June 1993 to May 1995, in our hospital, were reviewed.

The mean age of these patients was 36.4 (range 24-54) years; 7 were female. None of the patients has had a family history of TB. However, one patient had pulmonary TB two years earlier.

The patients were from the lower socioeconomic group. Ten patients were from rural areas. One was a Vietnamese. One patient was a mainliner while a female patient was infected with human immunodeficiency virus (HIV).

Mantoux test was performed in 9 patients and read after 72 hours. The sputum for acid fast bacilli (AFB) was done in 5 patients with productive sputum. While chest X-rays were done for all the patients, ultrasound examination of the abdomen and barium studies were undertaken in 6 and 5 patients respectively. Three patients underwent colonoscopic studies while sigmoidoscopy and computerised axial tomography (CT scan) were performed in 2 patients.

A total of 7 tissues were available for histopathological examination (HPE):

- i) 2 biopsies taken during colonoscopic examination,
- ii) sections taken from intestines during laparotomy,
- iii) appendix following appendicectomy for possible acute appendicitis⁵
- iv) 2 cervical lymph node biopsies (a third patient with lymphadenopathy refused biopsy) and
- v) 1 pleural biopsy.

Department of Medicine
Taiping Hospital
34000 Taiping
Perak, Malaysia

M Ramanathan, AM (M'sia),
MRCP (UK)
Consultant and Head

S Wahinuddin, MBBS
Registrar

E Safari, MD
Medical Officer

Department of Diagnostic
Imaging
Taiping Hospital

S P Sellaiah, M Med
Consultant and Head

Correspondence to:
Dr M Ramanathan

Table I - Symptoms and signs in patients with abdominal TB

Clinical features	No. (n=12)	Percentage (%)
Symptoms		
Fever	9	75
Night sweats	3	25
Diarrhoea	7	58.3
Abdominal pain	5	41.6
Vomiting	2	16.6
Abdominal distension	4	33.3
Abdominal swelling	1	8.3
Loss of appetite	12	100
Loss of weight	12	100
Cough	5	41.6
Ammenorrhoea (n= 7 females)	2	28.6
Signs		
Generalised wasting	8	66.6
Ankle oedema	5	41.6
Pallor	8	66.6
Clubbing	3	25
Lymphadenopathy	3	25
Respiratory system		
Normal	8	66.6
Pleural effusion	3	25
Apical crackles	1	8.3
Abdomen		
Ascites	4	33.3
Hepatomegaly	2	16.6
Splenomegaly	1	8.3
Doughy feel	1	8.3
Mass in right iliac fossa	1	8.3
Mass in pouch of Douglas	1	8.3
Rectal prolapse	1	8.3

RESULTS

The presenting symptoms and signs of the patients included in the study are shown in Table I. Some of these clinical features merit further elaborations:

1. Fever
Seventy-five percent of the patients had suffered from fever for periods ranging from 6 weeks to one year (mean 29 weeks). Fever was usually more marked in the later part of the day.
2. Diarrhoea
Seven patients (58.3%) complained of diarrhoea for periods ranging from one to 12 months with a mean of 5.6 months. These patients had an average of six episodes of diarrhoea per day. The stools were described as well-formed with no trace of blood. Five patients also suffered from nocturnal diarrhoea. There was no response to a therapeutic trial of metronidazole in these patients.
3. Abdominal pain
Five patients (41.6%) complained of abdominal pain. Four of them had experienced diffused dull abdominal pain for 1 to 3 months at the time of admission. One patient came in with sudden onset of pain in the right iliac fossa, simulating acute appendicitis.
4. Loss of weight
While all the 12 patients complained of loss of appetite and weight, only in 3 of them was there definite documentation. These 3 patients lost 8 - 25 kg (mean 16.6 kg) of weight over 6 months.

Investigations

The results of some of the laboratory evaluations done on these patients are shown in Table II. In addition, routine cultures and microscopic examination of stools of patients presenting with diarrhoea were negative.

The following investigations (number of patients on whom the tests were performed are shown in brackets) were either negative or normal: serology for *entamoeba histolytica* (3), thyroid function tests (4), carcinoembryonic antigen levels (2) and xylose absorption tests (1).

Serological tests for HIV were done on 3 patients and 1 of them was tested positive.

Mantoux test was positive (>10 mm) in 3 out of 9 patients (33.3%).

The ascitic fluid from 4 patients was straw coloured and exudative with the mean protein content being 60 g/L (range 58-72 g/L). The cell count was reported to be 'predominantly lymphocytic' with 15-20 cells/mm³. The ascitic fluid was negative for cytology, culture and staining for acid fast bacilli.

The sputum for acid fast bacilli (AFB) smears were negative in 5 patients with productive sputum.

The pleural fluid in 3 patients was also negative for AFB smears and culture.

Radiology

Chest radiography showed the following:

- i) normal in 5 patients (41.6%),

Table II - Serum biochemistry and baseline blood counts

Test	Mean	Range	Unit (normal value when indicated)
Haemoglobin	9.94	6.4 - 12.8	g/dL
Platelets	459	382 - 561	$\times 10^9/\text{mm}^3$
ESR	93.1	30 - 140	mm(1 st hour)
Albumin	24	17 - 31	g/L
Serum alkaline phosphatase	219	120 - 498	42 - 115 U/L
Blood urea	3.03	0.8 - 8.1	2.6 - 8.2 mmol/L
Serum cholesterol	2.38	1.6 - 2.89	3.5 - 6.5 mmol/L
Serum calcium	1.78	1.42 - 1.95	2.10 - 2.55 mmol/L

- ii) active pulmonary tuberculosis (PTB) (apical infiltrations/consolidation) in 3 patients (25%),
- iii) old PTB in 1 patient (fibrosis/calcified granulomas) (8.33%) and
- iv) pleural effusion in 3 patients (25%).

Ultrasound examination of the abdomen was normal in 2 patients, and in the remaining 4 patients, it confirmed the presence of ascites. In addition, it also showed a 3 cm x 3 cm hypoechogenic mass within the spleen in one patient, which was suggestive of lymphoma.

Barium studies were performed in 5 patients (41.6%). These studies included 2 follow through barium meal and 3 barium enema examinations. All the 5 examinations showed caecal abnormalities (100%). The barium studies suggested the possibility of gut tuberculosis with Crohn's disease as a close differential diagnosis. One of the barium follow through also raised the possibility of carcinoma of the colon.

Computerised axial tomographic scan (CT scan) of the abdomen was normal in one patient but ascites and hepatosplenomegaly were confirmed in another patient. In addition, it also showed a large hypodense oval mass within the spleen. The peritoneal fluid gave a reading of more than 20 Hounsfield unit indicating the fluid to be either exudative or pus-like in origin.

Sigmoidoscopy performed in 3 patients (25%) was normal.

Colonoscopy was performed in 3 patients (25%). The endoscopist felt that the colonoscopic appearances were consistent with TB in one patient and Crohn's disease in the second patient. The colonoscopy was inconclusive in the third patient, who was advised to repeat the examination, but the patient refused. In addition, 2 other patients refused colonoscopy.

Histopathological examination (HPE)

Both the lymph node biopsies showed features consistent with tuberculosis including caseating granulomas. The other biopsies were negative for tuberculosis. The colonoscopic biopsies were reported to be suggestive of Crohn's disease with TB as a close differential diagnosis.

Treatment and outcome

All the 12 patients were treated with the standard course of anti-TB chemotherapy consisting of isoniazid, rifampicin, pyrazinamide and streptomycin.

The patients showed prompt response to anti-TB chemotherapy with complete resolution of their symptoms within the first 3 months of treatment.

One patient was lost to follow-up after 4 months of treatment. The HIV positive patient responded to therapy initially. Her diarrhoea stopped and she regained her appetite and weight. But during the fifth month of treatment, she developed features of pneumocystis carinii pneumonia and encephalopathy and succumbed to her illness a few weeks later.

Table III - Other diagnoses entertained on admission

Diagnoses	No. of patients
Irritable bowel syndrome	3
Chronic diarrhoea	1
Functional diarrhoea	1
Malabsorption syndrome	2
Inflammatory bowel disease	4
Carcinoma of the colon	2
Lymphoma	3
Meig's syndrome	1
Algid malaria	1
Cirrhosis of the liver	2
Diabetic autonomic neuropathy	1
Acute appendicitis	1
Intestinal obstruction	1

DISCUSSION

There are several excellent reviews and studies on abdominal TB in the literature⁽¹⁻⁴⁾. These papers repeatedly emphasise the elusive nature of the disease and the difficulty encountered in making the diagnosis in view of the lack of specificity and sensitivity of the various diagnostic procedures.

It is clear that unless the clinician maintains a high index of suspicion, the diagnosis can easily be missed⁽⁵⁾. This dictum is clearly illustrated by the provisional diagnoses made in our patients (Table III). We entertained several possibilities rather than a single entity in our patients on admission. The 4 patients in whom we considered the likelihood of abdominal TB were those who came under our care after we started taking an interest in this problem. Our experience

reflects that of Chen YM et al⁽⁵⁾ where none of their 20 patients was pre-operatively thought to suffer from abdominal TB. Some of our patients had several admissions before abdominal TB was diagnosed.

We undertook this retrospective study to identify those clinical and laboratory features which may facilitate an early diagnosis of abdominal TB in future.

Our impression that abdominal TB affects mainly those from a lower socioeconomic background has been confirmed by others⁽²⁾. The condition however, does not spare even those from the upper strata of society⁽³⁾. This condition also appears to have a predilection for relatively young patients. Although Chen YM et al reported the mean age of their patients to be 55 years⁽⁵⁾, in other series, the mean age has been almost identical to that of ours, at 36.4 years⁽⁴⁾. HIV infection has proved to be the strongest risk factor for TB⁽⁶⁾. But we had only one patient with underlying HIV infection.

A detailed history of the patients' presenting symptoms provided us with some useful clues in diagnosing abdominal TB. Five of the 7 patients (71.4%) with diarrhoea suffered from nocturnal diarrhoea. Nocturnal diarrhoea has invariably been associated with an organic aetiology⁽⁷⁾. Thus the possibility of 'irritable bowel syndrome' and 'psychosomatic disorders' could have been easily excluded in these patients, especially when nocturnal diarrhoea was accompanied by fever and weight loss⁽⁷⁾. Our patients were presented with diarrhoea had it for an average period of 5.6 months. This long standing diarrhoea, coupled with the absence of frank bleeding per rectum or malaenic stools, could have made carcinoma of the colon less likely in these patients. Bleeding is rare in gut TB.

Seventy-five percent of our patients had fever on admission. This is quite similar to a recent Indian review, in which 66.2% of their patients were febrile⁽⁴⁾. In fact, 6 of our 9 patients with fever, met the criteria to be labelled as suffering from pyrexia of unknown origin (PUO). Thus, we felt that abdominal TB should be included in the differential diagnosis of PUO in the tropics, especially when associated with abdominal symptoms.

We had a low incidence of abdominal pain in our series, at 41.6%. In several large series, abdominal pain has been reported in 36% - 93% of patients, with an average of 58%⁽¹⁾. This wide variation in the incidence of abdominal pain may reflect patient selection as well as the changing nature of the disease⁽²⁾. Based on our experience, we feel that the absence of abdominal pain does not necessarily exclude gut TB.

It is important to note that abdominal TB may be complicated by amenorrhoea in 33% - 35% of patients⁽⁴⁾; otherwise this may be thought to point towards a primary gynaecological disorder in these patients.

Anaemia and the high ESR noted in our patients have been recorded in almost all large series of patients with abdominal TB^(1,2). These two features are however, non-specific as they may occur in a host of other conditions. But, the thrombocytosis, seen in our patients appears to be a useful feature in the early

detection of TB.

We noted clinical and biochemical evidence of malabsorption in 58.3% of our patients. These patients were anaemic and oedematous, with low blood urea, albumin, calcium and cholesterol and also moderately raised alkaline phosphatase levels. However, there was a complete resolution of these features with anti-TB therapy. Earlier reports alluded to the possibility of malabsorption in abdominal TB⁽⁸⁾, and it turned out to be a prominent manifestation in some of our patients. In fact, one patient was subjected to several investigations, including the xylose absorption test for malabsorption, before TB was diagnosed.

We did not find the Mantoux test useful, as only one-third of our patients had any significant reaction. In this regard, our experience is closer to that of a Nigerian study, in which only 15% of patients showed a positive reaction⁽⁹⁾. A negative Mantoux reaction therefore, does not exclude the possibility of abdominal TB.

The exudative ascitic fluid with prominent lymphocytosis is a recognised feature of TB peritonitis⁽¹⁾. Mycobacterium tuberculosis has been cultured from ascitic fluid only in a small proportion of cases⁽¹⁾. None of our patients had a positive ascitic fluid culture for mycobacterium tuberculosis.

The proportion of patients with abdominal TB who are reported to have abnormal chest radiography ranges from 10% - 100%⁽⁹⁾. Fifty-five percent of our patients had abnormal chest radiographs. Several authors have pointed out that a normal chest radiograph does not exclude the possibility of abdominal TB^(1,2). In fact, it appears that one of the main reasons for missing the diagnosis of abdominal TB is the misconception that the condition is always associated with active pulmonary TB.

The barium studies done in 5 of our patients were all abnormal (100%). These contrast studies showed caecal abnormalities. Although several subtle features on barium studies have been shown to be more consistent with ileocaecal TB, there is no particular feature which enables one to diagnose gut TB confidently on radiology alone^(1,2,9). The radiological differences between intestinal TB and Crohn's disease have always been difficult. There are reports in which TB has mimicked Crohn's disease⁽¹⁰⁾. Similarly, colonoscopy sometimes too, will not be able to distinguish intestinal TB from inflammatory bowel diseases^(2,4).

The lymph node biopsies were rewarding. But, the colonoscopic biopsies and the segments of intestines and appendix taken during laparotomy were negative for changes of TB. These negative tissue biopsies have been noted by others too. It is extremely difficult to distinguish TB enteritis from Crohn's disease on a superficial mucosal biopsy⁽¹¹⁾. Sometimes it is not possible to get a tissue diagnosis even when a patient had undergone multiple laparotomies⁽³⁾.

In retrospect, we feel that we could have dismissed most of the provisional diagnoses made in our patients earlier (Table III) by a careful review of their clinical profile, laboratory and radiological findings. But, the three conditions viz, lymphomas, Crohn's disease and

intestinal obstruction made it difficult to differentiate them from abdominal TB.

In one of the patients who presented with ascites, hepatosplenomegaly, anaemia and peripheral lymphadenopathy, we were convinced of a lymphoma, and proceeded with a CT scan of the abdomen and did a bone marrow aspiration, as well as a trephine biopsy to 'stage the lymphoma' while waiting for the lymph node biopsy report. The CT scan in this patient however, showed a hypodense mass in the spleen consistent with TB.

One patient underwent laparotomy for intestinal obstruction and was found to have fibronodular adhesions. This is not surprising, as a report from India shows that 50% of abdominal TB tend to present with intestinal obstruction⁽⁴⁾.

Recently, the measurement of adenosine deaminase activity (ADA) in ascitic fluid generated a lot of interest as a diagnostic tool for peritoneal TB. An ADA level of > 33 U/L has been shown to have about 100% and 95% sensitivity and specificity respectively^(12,13). But others feel that this test is supportive rather than diagnostic of TB peritonitis⁽²⁾. Peritoneoscopy too, has been shown to be useful⁽⁴⁾. Unfortunately, we do not have the facilities for ADA measurement or peritoneoscopy in our centre. We believe that the situation may be similar in other smaller hospitals.

Stool cultures for mycobacterium tuberculosis is possible. But this test is of limited value, as acid fast bacilli are rarely found in the stool⁽¹⁴⁾.

Thus, due to the limitations of the various diagnostic procedures, the inaccessibility to more sensitive tests and sometimes due to the patients' reluctance to undergo invasive procedures, it may not be possible to establish the diagnosis of abdominal TB convincingly. But the question is how certain should one be, before treating a patient with a potentially curable disease⁽¹⁵⁾. Moreover it has been stressed that 'when the likelihood of a given disease is extremely high, a negative result usually does not exclude the presence of the disease unless the test is highly sensitive'⁽¹⁶⁾.

Several reviews, algorithms and protocols recommend a trial of anti-TB chemotherapy, when the clinical situation suggests abdominal TB even if the diagnosis could not be proven conclusively^(14,17). In fact, a positive response to chemotherapy alone, even in the absence of a microbiological confirmation of TB, has been accepted for including a patient as a case of abdominal TB in very large series⁽²⁾. Thus, until a more specific and sensitive diagnostic procedure providing rapid results becomes available, the diagnosis of abdominal TB may be based on circumstantial evidence alone.

Based on our experience, we believe that there is a place for a therapeutic trial of anti-TB chemotherapy in TB endemic areas in the following clinical situations: a) patients with chronic diarrhoea of unknown aetiology and b) patients with exudative ascitic fluid in whom all other possible causes have been reasonably and safely excluded. A positive response to anti-TB therapy in the above situations should be accepted as sufficient ground for the diagnosis of abdominal TB. Our study reflects also, the experience of other workers from Third World countries^(2,3).

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