

Clinicopathological Profile of Patients with Abdominal Tuberculosis

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ABSTRACT

Background: Tuberculosis (TB) is not a uncommon problem throughout the world particularly in the developing countries like Nepal, India and Bangladesh. Abdominal Tuberculosis accounts for nearly 2% of tuberculosis worldwide. The aim of this study was to evaluate the clinicopathological profile with the help of other investigations in the diagnosis of patients with abdominal TB and their response to anti-tubercular therapy. This was a prospective cross-sectional study conducted in the department of Gastroenterology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during the period of October 2002 to June 2009.

Methods: Total 53 patients with abdominal TB diagnosed on the basis of clinical profile and supported investigation data like gross morphological findings at endoscopy, colonoscopy, diagnostic laparoscopy, laparotomy or histologically proven caseating granulomas were selected for this study. Detailed demographic, clinical profile, investigations and treatment response were recorded properly in a predesigned data collection sheet which were analyzed and compared with other studies.

Results: Out of the 53 patients, 33 were males and 20 females with age ranging 16-70 (Mean 30.01 ± 11.7) years. Abdominal pain was the most common presenting symptom in 47 (88.68%), fever in 45 (84.9%) and weight loss in 37 (69.81%) cases. Anemia was found in 41 (77.36%), cachexia 40 (75.47%), ascites 20 (37.74%), palpable abdominal mass in 14 (26.42%) and features of intestinal obstruction in 5 (9.43%) cases. Five patients had positive family history of TB and five had past history of pulmonary TB.

The diagnosis of abdominal TB was confirmed microscopically in 5 (9.43%), histopathologically in 31 (58.49%) and the remaining 17 (32.07%) cases were diagnosed by a positive response to anti-TB therapy. According to site of involvement, 31 (58.51%), patients had intestinal TB, 9 (16.98%) had peritoneal TB and disseminated TB in 20 (37.74%) of the case.

Twenty seven patients were given 3 drugs regimen for 12 months and 26 patients received 4 drugs regimen for 9 months under close supervision. By 9 months of therapy 51 patients become symptom free and no pathological findings were observed thereafter at follow up visits after 6 months. Response was not satisfactory in two patients and subsequent follow up investigation revealed to have Crohn's disease rather than TB and none of them died.

Conclusions: Abdominal TB is an important clinical entity having varied mode of clinical presentation. So the diagnosis of abdominal TB is difficult and careful approach to the patients and supportive investigation data are necessary to make the final diagnosis. Neither clinical features, laboratory, radiological and Endoscopic methods nor bacteriological and histopathological findings by themselves provide a gold standard in the diagnosis of abdominal TB. In this series of abdominal TB, intestinal TB was the most frequent clinical type and the common presenting symptoms were abdominal pain, fever and weight loss. If diagnosed early, it can be treated successfully with anti-TB drugs.

Keywords: abdomen, tuberculosis

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INTRODUCTION

Abdominal Tuberculosis accounts for nearly 2% of tuberculosis worldwide. According to WHO, the annual incidence of TB is nearly eight million with two million deaths world wide.¹ There is an increase in number of patients with typical as well as atypical extra-pulmonary presentations. Extra-pulmonary involvement of TB is reported to be 10-15% not infected with HIV, whereas the frequency is about 50-70% in patients with HIV infection.²

Gastrointestinal involvement has been reported to be 55-90% in patients with active pulmonary TB before the advent of specific anti-TB drugs which has been regressed to 25% after the development of specific drugs.³ Abdominal TB has an insidious course like any other chronic infectious disease without any specific laboratory, radiological or clinical findings making great difficulties in its early diagnosis. Various methods of investigations have been reported as the gold standard in the diagnosis of abdominal TB; however there are great difficulties in their application in clinical practice. So, to make a diagnosis of abdominal TB, it is still a challenge to the physicians. In most cases, a working diagnosis has to be made on strong clinical suspicion and supportive investigation data.^{3,4}

METHODS

This was a hospital based prospective case series study conducted in the department of Gastroenterology of BSMMU, Dhaka during the period of October 2002 to June 2009. After receiving the ethical clearance, in this study 53 patients with abdominal TB were randomly selected from the in-patient department of Bangabandhu Sheikh Mujib Medical University (BSMMU). Inclusion criteria: Patients having fever and weight loss with one or more of the followings- diarrhea persisting for > 1 month, abdominal pain, ascites, abdominal lymphadenopathy (based on USG), mesenteric thickening or masses (based on USG) or severe unexplained focal or generalized abdominal tenderness persisting for ≥ 7 days. The criteria for diagnosis of intestinal TB were clinical suspicion, endoscopic/colonoscopic/operative findings; histologic findings consistent with tuberculosis and or demonstration of AFB(acid fast bacilli) and response to anti-TB drugs. Patients with normal X-ray chest but symptoms and signs suggestive of intestinal TB were considered to have primary intestinal TB. Exclusion criteria: Patients with other than abdominal TB like pulmonary, pelvic or renal TB or too sick to undergo diagnostic laparoscopy or colonoscopy were excluded from the study. Study design: A detail data of all patients with clinical history, physical findings, investigation results and treatment response were recorded properly. Performed

investigations included a complete blood count, ESR, necessary routine hematologic and biochemical tests, Montoux test, X-ray chest PA view, plain X-ray abdomen in erect posture and ultrasonography of whole abdomen in all cases. Endoscopy of upper GI Tract, Barium follow through X-ray of the small gut, Barium enema X-ray of the colon, colonoscopy, abdominal computerized tomography, diagnostic laparoscopy or laparotomy, ascitic fluid study were done in selected cases where needed and possible. Ascitic fluid was studied for biochemical, cytological including malignant cells as well as AFB staining, culture for AFB was not possible due to lack of adequate facilities for the test. FNAC from abdominal mass or associated cervical lymphadenopathy was done in selected cases. A histopathological diagnosis was performed in all cases having suspected lesions at endoscopy, colonoscopy, CT scanning, laparoscopy or laparotomy taking multiple representative biopsies. Finally data of every patients were analyzed in relation to medical and family history, physical findings, routine hematologic and biochemical profile, Montoux test, radiography of the chest and abdomen, ultrasonography and CT scan of the abdomen, sputum/ascitic fluid for AFB staining and FNAC/histopathological basis for the diagnosis of abdominal TB.

Case-definition for abdominal TB was defined as tuberculosis affecting the gastrointestinal tract, peritoneum, abdominal lymph nodes, momentum, liver, spleen. A definite diagnosis of abdominal TB was made by identification of *Mycobacterium tuberculosis* on the sputum/smear from tissue and/or by demonstrating caseating granulomas at histopathology. Since abdominal TB is paucibacillary, the yield of organisms is low therefore the characteristic histologic changes were taken as diagnostic wherever tissue sample was possible. Laparoscopic findings consistent with TB for a presumptive diagnosis were the presence of tubercles, fibro adhesive peritonitis or caseating lymphadenopathy.

In patients where none of the working diagnosis was available but the clinical suspicion of abdominal TB was very strong, a therapeutic trial with four anti-TB drugs (rifampicin, isoniazide, pyrazinamide, ethambutol) was given and positive response to treatment by three months was considered as a diagnostic tool.

All patients with definite or probable abdominal TB were treated with standard anti-TB drug regimens as per WHO recommended schedule. As per National Guideline,²⁷ patients were treated with three anti-TB drugs (Rifampicin, INH and Ethambutol) and 26 by four anti-TB drugs (Rifampicin, INH, Ethambutol and Pyrazinamide) in standard doses for 12 and 9 months respectively keeping the patients under close monitoring.

RESULTS

In this study, 53 patients with abdominal TB- 33 males and 20 females of age range 16-17 (mean age- 30.01 ± 11.7) years were included, common presenting symptoms and signs were abdominal pain in 47 (88.68%), anorexia in 27 (50.94%), weight loss in 37 (69.81%), fever in 45 (84.9%), diarrhea in 20 (37.74%), abdominal distension in 20 (37.74%), cachexia in 40 (75.47%), abdominal mass in 14 (26.42%), ascites 20 (37.74%), abdominal tenderness in 11 (20.75%) (Table 2 , 3). Abdominal pain and fever appeared to be the most frequent symptoms. The mean duration of illness showed great variation among the patients (range one month to 7.5 years); five patients had positive family history of tuberculosis and five had past history of pulmonary TB.

Laboratory investigation data (Table-4) revealed presence of anemia in 45 (84.9%), high ESR in 47 (88.68%) and hypoalbuminaemia in 18 (33.96%) cases as the most prominent abnormalities. Other findings were leucocytosis in 6 (11.32%), raised serum bilirubin in only one (1.89%) cases. Of the patients having ascites, HBsAg and anti HCV were done in 11 (20.75%) and 4 (7.55%) cases respectively and found to be negative. All investigation reports were found to be normal in 5 (9.43%) cases. Montoux test was positive in 33(62.26%), and sputum for AFB-positive in 5 (9.43%) cases. Chest radiography showed lesions compatible with active pulmonary tuberculosis like patchy opacities, cavitation, pleural effusion or lymphadenopathy in 15 (28.3%) cases. Plain X-ray abdomen revealed evidences of sub acute or acute intestinal obstruction in 5 (9.43%) patients. Ascitic fluid study was done in 20 (37.74%) and found to be exudative in nature in 13 (24.53%); AFB staining was possible in 14 (26.41%) but none showed AFB positive result. Endoscopic pictures suggestive of tuberculous lesion was found in two (3.77%) like esophageal tuberculosis in one and duodenal tuberculosis in other with histological evidences granulomatous lesion compatible with tuberculosis. Barium follow through x-ray of the small gut was done in 20 (37.74%) cases of which 12 (22.64%) showed features suggestive of tuberculous lesion. Colonoscopy was possible in 25 (47.18%) patients of which 20 (37.74%) showed features highly suggestive of tuberculosis confirmed by histopathological evidences of caseating granulomatous lesion consistent with colonic tuberculosis in 15(28.30%).

Diagnostic laparoscopy and diagnostic laparotomy was done in 8 (15.1%) and five (9.43%) patients respectively. Thickening of the mesentery, multiple ulcers and tubercles on the peritoneal surface, multi-site strictures with proximally dilated bowel loops, mesenteric lymphadenopathy and haemorrhagic ascites were the positive findings in these patients Two patients

underwent intestinal resection surgery for correction of strictures. Confirmation of tuberculosis was made by histopathological evidence of granulomatous lesions on peritoneal, mesenteric lymphnodes or section biopsy samples. Cervical lymphode biopsy or FNAC revealed features consistent with tuberculous lesion in 6 (11.32%) cases. USG guided FNAC from SOL in the liver/spleen or abdominal mass was performed in four (7.55%) patients histopathologically which were consistent with tuberculous lesions and ultimately diagnosed as hepatic or splenic TB. Peritoneal TB could be confirmed in 9(16.98%) and tuberculous lymphadenitis in 20(37.74%) cases as disseminated tuberculosis.

Microbiologically confirmed diagnosis of abdominal TB was possible on 5 (9.43) patients; of which three were diagnosed by evidence of AFB positive sputum and two by AFB positive bronchoalveolar lavage. Thirty one (58.49%) patients were diagnosed on histopathological evidence of granulomatous lesion consistent with TB and the remaining 17 (32.07%) cases were diagnosed on the basis of positive response to anti-TB therapy. In only three patient both histopathologic and microbiological diagnosis of abdominal TB was possible.

According to the site of involvement, abdominal TB was categorized as intestinal TB-58.51%, peritoneal TB-16.98% and disseminated TB-37.74% respectively (The most common site of involvement was the ileocaecal region-15 (28.3%) followed by ileum-4 (7.55%), Jejunum-2 (3.77%), duodenum-one (1.89%) and lower esophagus-one(1.89%)

Fifty-one patients became symptom free after 9 months of anti TB therapy and no pathological findings were observed at the follow up visits after six month. In the remaining two the response was not satisfactory and subsequent follow up investigations revealed that these patients have crohn's disease rather than tuberculosis, none of them died.

DISCUSSIONS

Tuberculosis is a common disease worldwide especially in developing countries.¹ Extra-pulmonary TB is also common with abdominal involvement as the major site.⁶⁻⁸ Abdominal TB can affect gastrointestinal tract, peritoneum, mesenteric lymphnodes, liver, spleen and pancreas. The ileo-caecal region is the most common site followed by involvement of the jejunum and colon.⁹

Diagnosis of abdominal TB is usually difficult specially in the developing countries because of varied mode of clinical presentation mimicking a variety of diseases and lack of facilities for efficient, sensitive diagnostic tests including colonoscopy and diagnostic laparoscopy.⁹⁻¹² In most instances diagnosis is reasonably made by the process of exclusion⁵ and the diagnosis can be made

by evidences of clinical pictures of tuberculous lesions at laparoscopy or exploration of the abdomen. Three diagnostic stages have been evaluated in the diagnosis of abdominal TB. Stage I and II being clinical evaluation of the patients and the radiological findings provides indirect evidence of the disease. The third stage includes invasive tests to achieve direct evidence. The vague character of symptoms has been previously defined in many studies¹³⁻¹⁴ and the radiographic presentation of the disease frequently mimics many other conditions.¹⁵⁻¹⁶

Abdominal TB is predominantly a disease in young adults. Two thirds of the patients are of 21-40 years old and the sex incidence is equal.¹⁷ In this study the mean age of patients at presentation was 30.01 ± 11.7 (range 16-70) years which is relatively higher than that of the Indians, but lower in comparison to 46 year in the other studies.¹⁸⁻²⁰ Abdominal TB is reported to be more common in the females¹⁸⁻²² but our study showed a high incidence among the males (M: F = 1.15:1.00). The mean duration of illness ranges from one month to seven and half years (17.57 ± 19.43 months). A positive family history of tuberculosis or past history of pulmonary tuberculosis is quite frequent in patients with abdominal TB²³ which was observed in only ten patients of our study population (18.86%).

Non-specific abdominal pain and fever are the common symptoms²⁴⁻²⁶ though abdominal distension, ascites, anorexia and weight loss have been reported as the common presenting symptom in some series.²⁴⁻²⁷ The present study showed abdominal pain as the most common (88.68%) and fever (84.9%). Other symptoms are anorexia (50.94%), weight loss (69.81%), altered bowel habit (loose motion 37.74%), vomiting (33.96%) which are consistent with that of other studies.^{25,28,30} Anorexia, cachexia, lymphadenopathy are the common general findings whereas ascites, abdominal tenderness (20.75%) abdominal masses (26.42%) were the common abdominal findings. A palpable mass in right iliac fossa was found in 08 (15.09%) cases in comparison to 13-45% of other studies.^{29, 31,32} Five patients presented with features of subacute intestinal obstruction. Hepatomegaly was present in 11 cases and splenomegaly in 3 cases of which two were confirmed as hepatic tuberculosis and two as splenic tuberculosis by CT guided FNAC.

Routine laboratory investigations are non-specific and do not confirm the diagnosis. One study reported high ESR in 60% cases and positive Montoux test in 24% cases.³³ In the high endemic areas of TB, a positive Montoux test neither confirms nor excludes the diagnosis. In our study, ESR was found high in 47 (88.67%) cases and tuberculin test was positive in 33 (62.26%) cases. Sputum /Bronchoalveolar lavage had positive for AFB in

5 cases. Associated pulmonary TB was in 15 (28%) cases in our series in comparison to 19-58% of cases in other studies.^{24,34}

The radiographic presentation of abdominal TB may mimic other conditions.³⁵ Calcified lymphnodes, granuloma of spleen, liver and pancreas, dilated and thickened bowel loops, dilatation of the terminal ileum and ascites are the common findings in radiographs and ultrasonography. The combination of mesenteric thickening of 15mm or more with mesenteric lymphadenopathy are the prominent sonographic findings in abdominal TB³⁶⁻³⁸ which were also confirmed in our study. CT features of abdominal TB have been reported to be of value in the diagnosis.⁴ The common CT finding of abdominal TB are peritoneal thickening, abdominal lymphadenopathy and thickened bowel wall³⁴ which could not be well established in our study as because of high cost, CT scan was done in only two cases. In patients with ascites, peritoneal fluid was straw colored and exudative. ADA level is usually >33 u/L^{39,40} has been considered as a useful screening test, but we could not do it routinely due to its high cost. AFB are rarely seen on smear but may be cultured from sufficient amount of ascitic fluid. The yield may be increased by culturing a liter of fluid concentrated by centrifugation.

The invasive diagnostic tools have the very real advantage of examining the lesion itself either macroscopically or microscopically. However, these direct methods have some drawbacks in clinical practice. Colonoscopic findings of abdominal TB are problematic because of segmental involvement of the disease⁴¹ and because of low yield of granulomas as a result of submucosal disease. In a study of Singh and associates⁴², granulomas were seen in 44% of the patients and 19% of them had caseation necrosis. In our study we found colonoscopic abnormalities in 20(37.74%) patients with histological confirmation of TB in 15(28.30%) cases. In patients with palpable abdominal masses, direct FNAC could be helpful⁴³ to establish a definitive diagnosis. In selected group of patients, diagnostic laparoscopy with biopsy from the peritoneal surface has been reported to be more sensitive diagnostic tool. The findings could be used for treating patients with abdominal TB without any histological or bacteriologic confirmation. In this study laparoscopy was possible in eight patients with histopathological confirmation of the diagnosis in all (eight) and macroscopic diagnosis in seven cases (table 7). Mini laparotomy is reported as most sensitive and specific diagnostic procedure for abdominal TB⁴⁴. In our study laparotomy was possible in only five cases (of which two have histologically proved tuberculous granuloma-ileocaecal TB in one and peritoneal plus mesenteric nodal TB in one case and other two had disseminated lesions in the abdomen.

The confirmation of the diagnosis of TB at any site is ideally established by demonstrating AFB on smear or culture from the tissue or by demonstrating caseating granulomas at histopathology. Since abdominal TB is paucibacillary, the yield of organism is low, characteristic histological changes are taken as diagnostic. However, getting a tissue for histopathology may not always be possible.^{43,45}In the current study histological diagnosis could be made in 29 patients .In this study classical four drug regimen chemotherapy was prescribed for 26 patients and three drug regimen for 27 patients and a favorable outcome was observed in 51 cases after 9 months therapy. Some studies have used three drugs regimen only (INH, Rifampicin and Pyrazinamide) with good results.^{27,30} We also found the similar results with three (3) drug regimen .

CONCLUSIONS

Abdominal tuberculosis is one of the common extra pulmonary infections presenting with various mode of presentation. Neither clinical features, laboratory, radiological and endoscopic methods nor bacteriological and histopathological findings by themselves provide a gold standard for the diagnosis of abdominal TB. Patients with abdominal tuberculosis may present with Abdominal pain, ascites, abdominal mass or lymphadenopathy.

Table 1. Demographic profile of the patients (n=53).

Characteristics	Findings
Age range:16-70 years	Mean ±SD:30.01+11.7 years
Male: Female(33:20)	1.65:1.00
H/O BCG-Vaccination	06 (11.32%)
H/O Exposure to close relative with TB	05 (9.43%)
Past history of TB	05 (9.43%)
Number of patients with PEM	40 (75.47%)

Table 2. Clinical profile of the patients (n=53).

Symptoms	Frequency and Percentage (%)
Abdominal pain	47(88.68)
Fever	15(84.90)
Anorexia	27(50.94)
Weight loss	37(69.81)
Nausea and / or vomiting	18(33.96)
Altered bowel habit	26(49.05)
Loose motion	20(37.74)
Constipation	3(5.66)
Constipation Loose motion	3(5.66)
Normal bowel habit	27(50.94)
Cough	5(9.43)
Night sweating	3(5.66)
Evisceration following laparotomy	4(7.55)

Table 3. Presenting signs with their frequency in the patients (n=53).

Signs	Frequency and Percentage (%)
Cachexia	40(75.47)
Anaemia	41(77.36)
Bipedal oedema	5(9.43)
Jaundice	1(1.89)
Lymphadenopathy	20(37.74)
Generalized	3(5.66)
Cervical	14(26.42)
Axillary	2(3.77)
Cervical + Axillary	1(1.89)
Abdominal	4(7.55)
Ascites	20(37.74)
Abdominal mass	14(26.42)
Hepatomegaly	11(20.75)
Splenomegaly	3(5.66)
Hepato Splenomegaly	2(3.77)
Features of sub acute intestinal Obstruction	5(9.43)

Table 4. Investigation profile of the patients (n=53).

Investigations	Frequency and Percentage (%)
Haemoglobin HCT<41% in Men and<36% in Women	45(84.90)
Total count of WBC >11x10 ⁹ /L	6(11.32)
High ESR(>70mm in 1st hour)	47(88.68)
Serum bilirubin	18(1.89)
Serum Albumin	(33.96)
Positive Montoux test	33(62.26)
X-Ray chest suggestive of pulmonary TB	15(28.30)
Sputum / Bronchoalveolar lavage positive for AFB	5(9.43)
Histopathology of Endoscopic biopsy consistent with TB	2(3.77)
Plain X-Ray abdomen suggestive of intestinal obstruction	5(9.43)
Abnormal Ba-follow X-Ray of the small gut	12(22.64)
Exudative ascites	13(24.53)
Colonoscopic features suggestive of TB	20(37.74)
Colonoscopic biopsy consistent with TB	15(28.30)
LN biopsy granulomatous lesion consistent with TB	6(11.32)
FNAC from spleen and liver	4(7.54)
Laparoscopic biopsy consistent with TB	8(15.09)
Laparotomy biopsy consistent with TB	5(9.43)
Positive ADA	4(7.55)

Certain non-specific clinical features such as vague ill-health, low grade irregular fever, anorexia with weight

loss and altered bowel habit and response to therapeutic trial with anti TB drugs may also be helpful in some extent to establish the diagnosis of abdominal TB. Strong clinical suspicion with choice of appropriate investigations may be helpful to treat this disease Invasive procedure like diagnostic laparoscopy or laparotomy may be required to confirm the diagnosis in selected cases.

Table 5. Disease site (n=53).

Site of involvement	No of patient and Percentage (%)
Upper GI Tract	
Esophagus	01(1.89)
Stomach	0
Duodenum	01(1.89)
Jejunum/Ileum	05(9.43)
Ileocaecal / Caecal TB	15(28.3)
Colonic TB	07(13.21)
Rectal TB	01(1.89)
Small gut + Caecal TB	03(5.66)
Peritoneal TB	09(16.98)
Disseminated TB	20(37.74)
Liver + Mesenteric	02(3.77)
Spleen	02(3.77)
Associated Active Pulmonary TB	06(11.32)
Associated Pleural effusion	09(16.98)

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