ORIGINAL ARTICLE

Abdominal Tuberculosis in children: A diagnostic challenge

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ABSTRACT

Background: Abdominal tuberculosis(TB) may affect any part of the intestinal tract, the peritoneum and the hepatobiliary system. It can present with various clinical manifestations, frequently resembling other diseases.
Aim: To assess the various clinical manifestations, how to diagnose and outcome of abdominal TB in children.
Methods: It was a descriptive cross-sectional study and was conducted at Pediatric Medicine Department, The Children's Hospital and The Institute of Child Health, Lahore. A total of 30 patients were enrolled in the study who were diagnosed with abdominal TB between July,2017 to December, 2017. All patients less than 15 years of age and who presented with abdominal TB during this period were enrolled in this study. Complete history of all patients, such as clinical manifestations, detailed examination, various laboratory tests, drugs given and outcome was noted. Statistical analysis by SPSS version 20 was done.
Results: Out of thirty patients (15 boys and 15 girls) with abdominal tuberculosis, the mean age was 10.2 years. The commonest presenting complaint was abdominal distension in 29 (96%) patients followed by abdominal pain in 26(86%), fever in 26(86%), weight loss in 23(76%) patients and seven (23%) patients had surgical abdomen. Five patients had coexisting disseminated tuberculosis and one had tuberculosis meningitis (TBM). One patient was a case of coexisting Down syndrome, one of oculocutaneous albinism and one of neurofibromatosis-1. Abdominal tuberculosis involved abdominal lymph nodes in 26(86%), peritoneum in 19(63%), ascities in 23(76%), gastrointestinal tract in 22(73%), liver in 26(86%) and spleen in 15(50%) patients. Ascitic fluid examination of 18 patients revealed exudative picture with predominantly lymphocytes. Explolatory laparotomy was done in 2 patients. Diagnosis was done by ascetic fluid findings showing exudative picture, abdominal imaging, positive montoux test, positive history of contact with a TB patient, along with good response to anti-tuberculous therapy.
Conclusion: Abdominal pain and distention are the commonest clinical presentations followed by fever and weight loss. As single confirmatory test is not readily available, therapycan be started on the basis of clinical presentations and relevantlaboratory parameters.
Key words: Tuberculosis, Gastrointestinal tract, Peritoneum.

INTRODUCTION

Tuberculosis (TB) is a serious cause of death throughout the world. Almost 30% of the peopleare infected with mycobacterium tuberculosis worldwide[1].Tuberculosis leads to death of 3 million people every year globally.About 1 billion people will be affected between 2000-2020, 200 million people will develop disease, and expected deaths due to tuberculosis will be 35 million, if control measures are not taken[2].

Pakistan is among those countries where burden of TB is highest. The incidence of TB is 231 per 100,000 in Pakistan[3]. The main reason for increasing burden of TB is delayed presentation in developing countries[4].Out of eight million cases of TB diagnosed per year, 1.3 million belong to pediatric age group. So, children constitute 3-13% of all patients of TB[5].About 250,000 adults are infected with TB in Pakistan every year and 250,000(2.5%) children are at high risk of acquiring TB. Out of all infected patients, 5-10% would get tuberculosis,and80-90% have latent tuberculosis. About 8-20% of all deaths are due to TB in children[6]. In children, it is difficult to diagnose TB because it is difficult to isolate bacilli by culture even if culture facilities are good. Adults are usually the ones who pass tuberculosis on to children.

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The commonest site of extrapulmonary tuberculosis is abdominal TB which constitutes11%, which is said to afflict mostly young adults and adults, however it is not uncommon in childhood[7].Vague abdominal symptoms, low grade fever, weight loss are common presenting symptoms. The disease can present in three ways: 1- Intestinal, 2- Peritoneal, 3- Nodal,[8] but others classified it into diseases that involve abdominal viscera, the alimentary tract and the peritoneum[9].

The most common type of pathology seen in abdominal tuberculosis in the pediatric age were adhesive variety followed by nodal type[10].The commonest cause of peritoneal TB is due to extension from acaseous mesenteric nodes, which is due to hematogenous dissemination from the lungs[11].

The objective of the study was to assess the various clinical manifestations, how to diagnose and the outcome of abdominal TB among patients.

MATERIALS AND METHODS

This descriptive cross sectional study was done at Pediatric Medicine department, The Children's Hospital and The Institute of Child Health, Lahore and enrolled children with abdominal TB who were managed from July 2017 to December 2017. Patients below 15 years of age of both genders, having abdominal signs and symptoms and with score ≥7 on Kenneth Jones criteria for tuberculosis

diagnosis in pediatric age group, were enrolled in the study (Table 1). If patients have KJ score <7 and not having abdominal TB were not included in the study.

A form was filled and history and examination including history of contact with TB patient, vaccination status including BCG and nutritional assessment was done. Investigations were done such as complete blood count with ESR, serum albumin, liver function tests, chest X-ray, tuberculin skin test, ascitic fluid analysis, abdominal ultrasonography (USG), computed tomography (CT) scanning of abdomen and barium studies were done where required. Sputum, gastric aspirate, and ascitic tap were done for tubercle bacilli isolation. Anti-tuberculous therapy was prescribed to all patients and patients were followed for improvement and outcome determined while patient stayed in hospital.

RESULTS

Out of 30 patients presented with abdominal TB,50 % were male with M:F 1:1. Most of them were older than 5 years, 12(40%) patients were between 5-10 years, 18(60%) were between 10-15 years and the mean age was 10.2 years (range 5-15 years). At the time of enrollment, abdominal distension with duration of 10 days to 8 months was the most common complaint in 29(96%) patients followed by abdominal pain and fever. Seven patients presented with surgical abdomen. Laparotomy was done in 2 patients, while 5 patients were managed conservatively. In 2(6%) patients there was bleeding per rectum and the cause was infectious colitis. (Table 2)Five patients had coexisting disseminated tuberculosis and one had disseminated TB with TBM. One patient was a case of coexisting Down syndrome, one of oculocutaneous albinism and one of neurofibromatosis 1.

History of contact with TB patient was present in 16(53%). In 5 cases, contact was father, mother in 3, grandfather in 3, another sibling in 2, cousin in 2 and aunt in 1 patient.

Only 16(53%) have been vaccinated for BCG. Generalized lymphadenopathy was present in 12(40%) patients. Most of them were malnourished, while 16(53%) were severely malnourished.

On abdominal examination, 29(96%) patients had abdominal distension, abdominal tenderness in 24(80%), abdominal mass was palpable in 13(43%), ascities in16(53%), hepatomegaly in 26(86%) and splenomegaly in 15(50%) patients.

Investigations showed low hemoglobin (Hb<9gm/dl), leukocytosis (TLC >11,000/mm3), hypoalbuminemia (serum albumin <2.5gm/dl) and deranged transaminases in most patients. ESR was raised in 26(86%) patients. Ascitictap was done in 18 cases and picture was exudative in all cases.

Abdominal imaging showed abdominal lymph nodes involvement in 26(86%) patients, ascities in 23(76%) patients followed by bowel wall thickening in 22(73%) patients. In 7 patients, barium contrast study was done. It revealed normal findings in 2 and narrowed and deformed caecum in 5 patients. Cultures for MTB was not found in either ascitic fluid, sputum or gastric aspirate. Histopathological findings from intraabdominal tissue specimen of 2 patients who underwent surgery revealed chronic inflammatory changes suggestive of tuberculosis (Table 3).

All patients were put on ATT, including rifampicin, isoniazid, pyrazinamide and streptomycin / ethambutol for first 2 months and for next 9 months, isoniazid and rifampicin were continued. 28 patients complete treatment without any immediate complications. While two patients died during hospital stay, one with disseminated TB with TBM and one with disseminated TB with neurofibromatosis

Table 1: Kenneth Jones criteria for TB diagnosis

	1	2	3	4	5
History					
Age	Less than two years				
Contact	With TB patient-sputum –ve		With TB patient-sputum +ve		
BCG scar	absent				
H/Owhooping cough & measles	in last3-6 months	in last3 months			
immunosuppressant or Immunocompromised	yes				
PCM 3	yes		Not improving		
Examination and investigations					
Physical examination		suggestive*		Strongly suggestive**	_
Radiological findings	Not specific***	highly suggestive****	_	_	_
Mantoux test/ BCG	5 to10 mm	_	More than 10 mm	_	_
Granuloma					Specific TB
AFB					positive

Interpretation:
0-2 points TB unlikely 3-4 points keep under observation 5-6 points tuberculosis probable, investigations may justify therapy
7 or more points TB unquestionable If * pneumonia / consolidation not responding to antibiotic therapy
If ** tuberculous pleural effusion, gibbus If *** ill defined opacity, marked bronchovasscular marking
If **** paratracheal / mediastinal adenitis, miliary mottling

Table 2: Signs and symptoms in children with abdominal tuberculosis(n= 30)

Presenting complaints	Number	%
Abdominal distension	29	96
Abdominal pain	26	86
Fever	26	86
Weight loss	23	76
Pretibial edema	8	26
Surgical abdomen	7	23
Cough	13	43
Vomiting	13	43
Bleeding per rectum	2	6

Table 3: Investigations and results

TEST	TEST	YES	NO	TOTAL
BLOOD				
	Low Hb<9gm/dl	22	8	30
	Leukocytosis >11,000/mm3	18	12	30
	Hypoalbuminemia < 2.5gm/dl	23	7	30
	Raised transaminases	19	11	30
	Raised ESR >20mm in 1st hour	26	4	30
ASCITIC FLUID				18
	Leukocytosis	18	0	
	Lymphocytosis	18	0	
	Increased protein level	18	0	
	Reduced glucose level	18	0	
OTHER TESTS				
	Positive Tuberculin test	11	19	30
	Chest-Xray consistent with PTB	16	14	30
ABDOMINAL IMAGING (USG/CT)				
	Lymphadenopathy	26	4	30
	Ascities	23	7	30
	Thickened peritoneum	19	11	30
	Bowel wall thickened	22	8	30
	hepatomegaly	26	4	30
	splenomegaly	15	15	30
BARIUM STUDIES		5	2	7
AFB ISOLATION				
	sputum	0	30	30
	Gastric aspirate	0	30	30
	Ascitic fluid	0	18	18
	Intra-abdominal tissue specimen	2	0	2

DISCUSSION

Tuberculosis is a major health problem despite after improvement in laboratory facilities and treatment in the developing countries especially the Indo-Pak subcontinent and Africa[12]. Tuberculosis is a devastating disease and reemerged during the last decade with significant morbidity and mortality.

Abdominal TB can affect any age but is more common in young adults. In our study the mean age was 10.2 years (range 5-15 years). Agarwal et al[13] found that it mostly occurred in the age group of 5-9 years, while Johson et al[14] found more than half their cases were under 4 years of age. In our study both male and female were equally affected. However some studies reported female dominance[15], while some studies reported male dominance[16], but Mersha found that both sexes were nearly equally infected[17].

The presentation of TB abdominal is nonspecific and variable. The manifestations during initial phase are not specific, including ascites causing distension of abdomen, fever, pain and loss of weight.[18,19]Our patients present with similar clinical manifestations. Abdominal distension was the commonest complaint in our study (29 patients) followed by abdominal pain and fever (26 patients).

TB is chronic disease with slowly progressive course and presentation. Usually symptoms last for weeks to months, and rarely years. TB is rarely an emergency by Lambrianides et al[20]. In our study, most of the children had constitutional symptoms of variable duration from 10 days to 8 months before coming to hospital. After taking several medications from private general practitioner and local hospitals, all of them were referred to the hospital in the later development of disease while most of them had been in undernourished condition.

In most cases of abdominal TB spread is by contact with TB patient and family history is usually positive, as in our study history of contact was present in 16 patients and father was the most common contact found in 5 patients. Most of children (22 patients) in this study revealed anemia, while Sharma et al reported all his cases to have anaemia.[21] We found less than half of our patients (11 patients) had positive tuberculin test while Agarwal et al[13] found in 90%. This might be due to most of our patients were undernourished. We found that 16(53%) patients with abdominal tuberculosis had chest X-rays suggestive of

pulmonary tuberculosis (PTB). No findings on chest X-ray were found in the remaining 14 children. Hencea normal X-raychest does not rule out TB possibility, while radiological findings of TB on X-raychestif present favours the diagnosis.

Ascitic fluid analysis in abdominal TB reveals exudative picture with predominance of lymphocytes and serum ascitic albumin gradient of <1.1g/dl.[22]In 18 patients ascitictap revealed exudative picture.

Abdominal ultrasonography (USG) iseasily available andnoninvasive modalityfor diagnosing abdominal fluid and abdominal lymphadenopathy. It can be used as first-line investigation for the diagnosis of abdominal TB. The most commonUSG finding of abdominal TB are ascities and lymph node enlargement, as noted in our study.[23]Barium studies can detect ileocaecal and colondisease. (24) Barium contrast studies were done in 7 patients and showed changes inileocaecal in 5 patients.

The organisms are rarely demonstrated on sputum smear, ascitic fluid and gastric aspirate and yield of culture are also low in many studies. Veeragandham et al[8] reported that mycobacteria were isolated in 4% cultures. In our study, all specimen yielded negative results for acid fast bacilli (AFB) and cultures as well. Although the diagnostic procedures in the form of laproscopy, open biopsy and USG guided biopsy were not carried out to confirm all the children, but the histopathologic findings of ascitic fluid, positive tuberculin test, positive source of TB in the household, abdominal USG/CT findings consistent with abdominal TB and response to TB treatment showed that TB was likely possible. Antituberculous therapy (ATT) is the mainstay of treatment and the response to chemotherapy usually is excellent.[8,14] As in our study 28 patients used ATT and improved. Two patients expired, so the mortality was 6.6%.

CONCLUSION

Diagnosis of abdominal TB is very difficult due to non-specific symptoms and signs.Abdominal pain and distention are the commonest clinical presentations followed by fever and weight loss. As single confirmatory test is not available treatment may be initiated on the basis of clinical presentations.If there is suspicion of diagnosis, then a therapeutic trial and response to therapy is helpful.

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