

Original article

Abdominal tuberculosis in children

Nataprawira HMD, Henny Komalia

Department of Child Health Medical Faculty Padjadjaran University Bandung- Indonesia

ABSTRACT *Abdominal tuberculosis is one of the extrapulmonary tuberculosis commonly found in adolescents, however, due to its non-specific and vague abdominal symptoms, it is rarely found and reported in children. To evaluate abdominal tuberculosis in children from clinical point of view, we conducted a 5-year retrospective study on children hospitalized over a period of 1995 to 1999 in Hasan Sadikin Hospital-Bandung. Of the 15 children diagnosed as having abdominal tuberculosis, 10 (66.7%) were female and 5 (33.3%) male, age ranged from 14 – 162 months and most of them were > 10 years of age. On admission, abdominal distention was the most common complaint found (60.0%), followed by dyspnoea 3 (20.0%), abdominal pain 2 (13.3%) and generalized oedem 1 (6.7%). Most of the children (93.3%) were undernourished which half of them were severely undernourished. Seven children showed positive Mantoux testing with PPD 5 TU. There was family history of adults TB discovered in 9 (60%) of the children. Eighty-percent had BCG vaccination and 6 (50%) of the showed positive scarr. Chest X-ray showed pulmonal and/or pleural involvement in 13 of the 15 children (86.7%). All ascitic fluid taken from 9 patients showed increased protein level and lymphocyte predominance. Histopathologic examinations of 5 children supported the diagnosis. There was no positive results of acid fast bacilli and culture done for Mycobacterium tuberculosis in gastric aspirate as well as ascitic fluid. Peritonitis tuberculosis was most commonly diagnosed (80.0%), followed by mesenterial/nodal tuberculosis (20.0%). All of the children followed (60.0%) responded well to the drugs therapy. [Paediatr Indones 2001; 41:155-159]*

Keywords: abdominal tuberculosis, diagnosis, children

ABDOMINAL TUBERCULOSIS (ABDOMINAL TB) IS ONE of the common sites of extrapulmonary tuberculosis (11%) which is said to afflict mostly young adults and adults,^{1,2} however, reports from developing countries indicate that it is not uncommon in childhood.²⁻⁷ In the developed countries the increasing of its incidence is probably due to the influx immigrants from third world countries.^{1,8} Therefore, it is particularly found in the areas with large immigrant population.¹

The clinical diagnosis is difficult because of vague symptoms, nonspecific signs and non-availability of spe-

cific diagnostic test. Vague abdominal symptoms, low grade fever, loss of weight are common presenting symptoms,^{4,5} and these may partly explain the delay in presentation of some patients.^{1,8} Therefore, most of them were taken to the hospital in later development of the disease with abdominal mass or masses felt in the abdomen or ascites and even attacks of intestinal obstruction with acute pain and distention of the abdomen as complaints.^{1,8} Furthermore, the difficulty of its diagnosis and treatment arise when the patients come to the hospital with concomitant liver disease or with symptoms with generalized oedema. The unusual clinical presentation presenting as a periumbilical abscess had also been reported.⁹ The absence of radiological evidence of pulmonary TB, negative tuberculin test, overwhelming disease, depressed immunological status may create a very low index of suspicion in many cases.

Correspondence: HMD Nataprawira, M.D., Department of Child Health, Medical School, Padjadjaran University, Bandung, Indonesia

There are three patterns of clinical presentations: 1) intestinal, 2) peritoneal, 3) nodal,⁶ but others classified it into diseases that involve abdominal viscera, the alimentary tract, and the peritoneum.⁸ The most common type of pathology seen in abdominal tuberculosis in the paediatrics age were adhesive variety followed by nodal type.¹⁰ The most common cause of peritoneal TB is extension from caseous tuberculosis of mesenteric nodes, which it itself usually due to hematogenous dissemination from primary focus in the lungs.¹¹ The protean clinical manifestations and varied complications of abdominal tuberculosis continue to challenge acumen and therapeutic skills of all physicians. To evaluate the clinical aspects of abdominal tuberculosis in children, we conducted a 5-year retrospective review of medical records children hospitalized over a period of 1995 to 1999 in Hasan Sadikin Hospital.

Methods

The patients in this study were identified retrospectively from the medical records of the hospital. Children less than 14 years were taken as the criteria for study. We reviewed 15 children diagnosed as having as various abdominal tuberculosis as main diagnosis or additional diagnosis such as mesenteric TB, peritonitis, polyserositis TB hospitalized over a period 1995-1999.

We assessed the history of the disease, history regarding age, sex distribution, BCG vaccination, presenting signs and symptoms, clinical modes of presentations, site of involvement, and various investigations performed (routine and biochemistry of blood examinations, biochemistry, leukocyte and differential count of ascitic fluid, chest and abdominal X-ray, abdominal and or thorax ultrasonography (USG), computed tomography (CT) scanning, biopsy and, histopathologic findings), treatment given and followed up.

Results

In our study the youngest patient was a 14 month old infant and the eldest was a 162 month ($13\frac{1}{2}$ year) old male child. Most patients were > 10 years of age. There was female preponderance with female to male ratio of 10:5.

Abdominal distention with various duration of 3 weeks – 5 months was the most common presenting

symptoms when children admitted to the hospital, whereas abdominal pain or generalized edema were other symptoms found, respectively. Before admitted to the hospital, all of the children were treated in a community health center and or by general practitioners, which initially frequently confused with typhoid fever or unspecified or uncertainty diagnosis. Furthermore, due to no improvement and no relief of the symptoms, all of the children then were referred to our hospital. One of the children with abdominal distention was referred with diagnosis as suspected liver disease whereas one with generalized edema was referred as having heart failure and one with renal failure, respectively while others were referred unspecifically.

Before admitted to the hospital with later development of disease, all of the children had various non-specific clinical symptoms such as on and off fever on and off ranged between 1- 8 months, while most of them (2/15) had anorexia ranged during 1 – 12 months and loss of body weight) with ranged 1 – 9 months. However, only 5 of the 15 children had vague pain in the abdomen on and off in an undefined area. All children also had abdominal distention. Palpable masses was felt only in two children (Table 1).

Twelve children had BCG vaccination and 6 of them showed positive scar. There was family history of adults TB cases in 9 of the children. Most of the children (14/15) were undernourished which half of them were severely undernourished. Tuberculin skin testing (Mantoux test) with PPD 5 TU performed to all children only gave a positive result in 7 children. We found 9 of 15 children with abdominal tuberculosis also had pulmonary tuberculosis (PTB), and 9 of them had also extrapulmonary TB in other sites such as pleural (2/9), pleural and pericardial (1/9) and cervical superficial lymph nodes (4/9).

Laboratory findings

Hemoglobin value showed 5.8 – 13.5 g/dl (mean 9.55 g/dl), however, 2 of the children had value of its normal level. Various leukocyte counts were found between 4,400 – 13,000/ μ l. Liver function test revealed normal values, except 3 children showed slightly increased values. Five of the 11 children with total protein and albumin serum performed showed a low level.

TABLE 1. SIGNS AND SYMPTOMS ASSOCIATED WITH CHILDREN ABDOMINAL TUBERCULOSIS

Signs and Symptoms	Number of children
Abdominal distention	15
Fever on and off	15
Anorexia	14
Loss of weight	14
Abdominal pain	5
Abdominal mass	4
Night sweats	3
Dyspnea	3
Pretibial oedema	3
Enlargement lymph nodes	3
Vomiting	1

Children referred as having renal failure, normal value of ureum and creatinine level was found (24 mg/dl and 0.6 mg/dl, respectively) while children referred as having liver failure, their laboratory findings showed normal value of electrolyte, urea-N and creatinine and glucose, negative Hbs Ag and anti HCV, slight increased transaminases, decreased protein and albumin serum level, normal value of alpha feto protein (AFP), increased total and direct bilirubin.

Ascites puncture performed in 9 children, all of them yielded predominance of lymphocyte count (60.0-92.0% of lymphocyte) with increased protein level (173-5,470 g/dl). Culture for *M. tuberculosis* was not found in either ascitic fluid or gastric aspirate. Histopathologic findings from 5 ascitic fluid and pleural fluid revealed chronic specific inflammatory suggestive TB (Table 2).

Radiographic findings

Thirteen of all children with chest X-rays performed showed abnormalities compatible with TB. Five of them showed right pleural effusion (two of them with bilateral pleural effusion), pneumonia in 4 children, enlargement of hilar and paratracheal areas and or infiltrate suggestive with TB found in 5 children; right middle lobe atelectasis which was supported by thorax CT scanning was found in a child with bilateral effusion, while no abnormalities was shown in the other two children.

Abdominal X-ray performed in 6 children, ascites was only seen in 3 of the 6 children and abdominal masses in 1 while no findings either ascites or enlargement of the lymph node as well as calcification

found in the remaining two children. Enlargement of paraaorta / parailiacal and mesenteric lymph node was shown in 3 of five children with abdominal USG examination classified as nodal variety.

TABLE 2. INVESTIGATIONS AND RESULTS OF 15 CHILDREN

Blood	Yes	No	Total
Low Hb content	13	2	15
Leukocytosis	9	6	15
Abnormal protein total & albumin	5	7	12
Transaminases	3	12	15
Ascitic fluid			
Positive Rivalta reaction	9	0	9
Leukocyte count	9	0	9
Lymphocytosis	9	0	9
Increased protein level	9	0	9
Reduced glucose level	9	0	9
Other tests			
Positive tuberculin test	7	8	15
Chest X-ray consistent with PTB	13	2	15
Abdominal x-ray: ascites or mass	5	1	6
Abdominal USG: enlarged paraaortic /mesenterial lymph nodes lymph nodes	3	2	5
Chest CT-scan right middle lobe atelectasis	1	0	1
AFB for <i>M. tuberculosis</i>	0	15	15

Treatment and follow-up

Oral antituberculous drugs (isoniazid, rifampicin, and pyrazinamide) were given to all children but one. Corticosteroid (prednisone orally) was also given to children with peritonitis and pleural and/pericardial effusion TB. Even though most of them (93.3%) returned home against medical advice, five of them came in outpatient clinic of our hospital and took the medication regularly while one of them still regularly do so. Three children were followed up for 5 months - 3 ½ years after cessation of treatment and all of children responded well to the treatment given.

Discussion

Abdominal TB can occur in any age but is predominantly a disease of young adults with the mean

age of patients being 30-40 years.¹ However, it is also can occur in children while most of our patients were school children with age predominant more than 10 years of age (66.7%). Agarwal et al² found that it mostly occurred in the age group of 5-9 years, while Johnson et al⁵ found more than half their cases were under 4 years of age. In several reports in Third World countries, female children were preponderance than male as its also found in our observation, and it is assumed that women may play a nursing role among infected members of the family.¹ This observation is the reverse of the male-dominant series from Britain¹. However, Mersha found that both sexes were nearly equally infected.⁴

The disease is characterized by different modes of presentation i.e. chronic, acute on chronic, acute, or it may be an incidental finding at laparotomy from some other disease.² In our series, most of the children had constitutional symptoms such as fever on and off, anorexia, loss of weight with long duration and also several of them had unspecific gastrointestinal symptoms, however, these cannot be diagnosed as having TB initially. After taking several medications in the community health center and or private general practitioner, all of them were referred to the hospital in the later development of disease while most of them had been in undernourished condition. It's noted that they presented as a long-lasting or chronic process. The complications to the nutrition status, other disease which also occurred concomitantly such as liver disease tend the disease more complicated and diagnose not easy to be made. Indeed, only less of half of our patients had Mantoux test positive, while Agarwal et al² found 90.0%. This might be due to most of our patients (93.3%) were undernourished which more than half of them were severe-undernourished.

In this study, 14 of 15 children had constitutional symptoms as weight loss, fever in 15, anorexia in 14, night sweats in 3 cases. The same as reported by Agarwal et al, except night sweats was found more frequent than anorexia.²

Even though three children admitted with dyspnea as a chief complaint/main symptom and their chest X-rays showed right pleural effusion and pericardial effusion, bilateral pleural effusion, while the other child showed right lobe pneumonia which these would appeared prominent than their abdominal symptoms, it was found that peritonitis TB also occurred. Each of two children admitted with generalized edema and liver disease had been examined extensively. Even though he was sent to the hospital with written referral letter of having heart

failure and then initially diagnosed in our hospital as having nephrotic syndrome, furthermore, we found that his chest X-ray showed bilateral pleural effusion supported with thorax CT-scan which also found right middle lobe atelectasis, while his heart USG showed pericardial effusion. Histopathologic findings of ascitic and pleural fluid yielded chronic inflammatory process suggestive TB and he showed good response to TB treatment. This might explained that the disseminated tuberculosis had been occurred. The other child with liver cirrhosis had fever, which is infrequent in cirrhotic patients with ascites unless complicated by tuberculosis.

The organisms are rarely demonstrated on smear, ascitic fluid and gastric aspirate and the yield of culture are also apparently low in many studies. However, Veeragandham et al reported that mycobacteria were isolated in 71,4% cultures⁶. In our study, all specimens yielded negative result for acid fast bacilli (AFB) and culture as well. Even though the bacteriology study of ascitic fluid is not very rewarding and the diagnostic procedures in the form of laparoscopy, open biopsy and USG guided biopsy was not carried out to diagnosing to all of the children, the histopathologic findings of ascitic and pleural fluid, positive Mantoux test, positive source of adults TB in the household and response to TB treatment showed that TB was likely possible.

Most of children in this study revealed anemia, while Sharma et al reported all his cases to have anaemia.¹⁰

We found that 9 of 15 children with abdominal tuberculosis had chest X-rays suggestive of pulmonary tuberculosis (PTB) and one of them was supported by thorax CT-scanning. No findings on chest X-ray were found in the remaining six children. While findings of TB on chest X-ray support the diagnosis of abdominal TB, a normal chest X-ray does not ruled out TB possibility.

Peritoneal involvement accounted for the majority of cases in our study while nodal or mesenteric adenitis type of abdominal TB were less commonly found. The same results were also found in King's college Hospital London (83.3%) and Red Cross War Memorial Children's Hospital in Cape Town (86.4%).¹⁵ However, in the United States it was reported that one of the three clinical patterns found more evident was intestinal.⁶ According to how does abdominal TB arise, a secondary tuberculosis

might be the possibility in all of our cases where the primary focus mostly in the lungs. Peritoneal TB might be occurred when the TB focus disseminated through hematogenous or from rupture of tuberculous mesenteric nodes.^{8,11}

Antituberculous therapy is the mainstay of treatment and the response to chemotherapy usually is excellent.^{5,6} Prednisone was also given to TB treatment on peritonitis or polyserositis TB children even though it is still controversial. For liver cirrhosis patient, ethambutol and streptomycin were given otherwise it was likely noted not to be effective and curable. Even though most the children took home against medical advice, 9 of the 15 children were followed (60.0%) responded well to TB treatment given.

We conclude that abdominal tuberculosis is difficult to diagnose because of vague its symptoms, non-specific signs and no specific diagnostic tests available and these may partly explain the delay in presentation of some patients. Therefore, most of them were taken to the hospital in later development of disease. It's noteworthy that a high index of suspicion is needed to make a prompt diagnosis.

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