



PREVALENCE OF ABDOMINAL TUBERCULOSIS IN CHILDREN

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ABSTRACT

Introduction: Identification of tuberculosis among children poses technical and operational challenges. Abdominal tuberculosis (ATB), where the variable clinical manifestations continue to challenge the physicians in its diagnosis and therapy. **Methods:** Medical records of 115 patients who were diagnosed with ATB over a period of six years were studied retrospectively. Details of history, physical examination and investigations, treatment and outcome of therapy were evaluated. **Results:** The mean age of the patients was 6.4 years. Commonest symptom at presentation was abdominal pain, followed by fever. Nine patients presented with acute abdomen. Mantoux test was positive in thirty nine percent and accelerated BCG reaction was found in 40.1% percent. Verification of most important focus was found in 41.9% of chest radiographs. Commonest ultrasonography and computed tomography findings were mesenteric thickening, followed by intra-abdominal lymphadenopathy. Tuberculous infection could be confirmed in 38 patients. The classical plastic variety was the commonest type of ATB found. A complete cure with antituberculous drugs was documented in over 90 percent of the patients. **Conclusion:** In high frequency zones, ATB must be considered as a differential diagnosis in children presenting with non-specific constitutional symptoms and abdominal pain. When confirmatory tests are not available, supportive investigations and clinical suspicion should be careful powerfully for diagnosis of ATB to avoid delay in treatment. Timely use of laparoscopy and laparotomy may be required for confirmation of diagnosis.

Key words: Abdominal Tuberculosis, Ultrasonography, Computed Tomography, Lymphadenopathy, Mycobacterium Tuberculosis..

INTRODUCTION

Tuberculosis is one of the serious public health problem in India. It is vast and estimated that up to 40% of the population is infected. Which is responsible for morbidity and mortality in children in develop countries. The frequency of paediatric age group is 1-6 per thousand years 1. Mainly mycobacterium tuberculosis involves in lungs, peripheral lymphnodes, CNS and bones². In general, abdominal Tuberculosis (ATB) is the sixth mainly recurrent extrapulmonary site. It may occupy the gastrointestinal tract, peritoneum, lymph nodes or solid viscera and represent up to twelve percentage of extrapulmonary TB from total TB infectious cases³.

After the upgrading of specific medication, gastrointestinal concern has decreased from a high of 55%-90% to 25% in patients with active pulmonary TB⁴. Until

now, the variable clinical manifestations of abdominal tuberculosis (ATB) persist to dispute with the physician in its diagnosis and therapy. In the paediatric age group, there were the clinical manifestations may differ from individuals of the adults.

The number of cases the children's incapacity to define their problems exactly contributes to this challenge. In present study of patients that ATB, caused by its indolent course, may present late and delay in its treatment is likely. The difficulty is worsened by the limited accessibility of exact and complicated diagnostic tests in developing countries. In most often, a working diagnosis has to be made on strong clinical suspicion and on supportive investigational data.

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The present study Prevalence of Abdominal Tuberculosis in paediatric age of children.

MATERIAL AND METHODS

In present study ,we carried out a retrospective review of the pediatric medical records of all of our patients ≤12 years of age diagnosed with ATB at Sri Balaji Medical college and Hospital, Chennai, Tamilnadu and approved by institutional Ethical clearance. Abdominal tuberculosis was definite as tubercular involvement of the various organs of the abdominal cavity likely small or large intestines, peritoneum, lymph nodes, and visceral organs.

Diagnosis:

Mantoux test was examined 48–72 h after the intradermal injection of five tuberculin units of purified protein derivative. This test were considered positive diameter of induration was ≥15 mm.

“Confirmed case of abdominal tuberculosis”—diagnosis based on the bacteriological identification of Mycobacterium tuberculosis through Ziehl-Neelsen stain, culture polymerase chain reaction (PCR)-based assays and also the presence of caseating granulomas on histology. Liquid medium MGIT 960 used for culture of tuberculosis. ELISA test for detection of IgG, IgA and IgM antibodies.

“Clinically diagnosed abdominal tuberculosis”—diagnosis based on strong clinical suspicion and exclusion of other diseases, with suggestive features on imaging, histology, and biochemistry elevated ADA >30 U/L.

All children underwent an abdominal ultrasonogram (USG) and computed tomography (CT). Imaging findings considered indicative of TB included that ascites, lymphadenopathy appeared as conglomerate masses and scattered enlarged nodes with hypoechoic peripheral rim enhancement, nonhomogenous enhancement.

Bowel wall thickening, peritoneal thickening and nodularity, adhesions, mesenteric thickening, and irregular soft tissue densities in the omental area; and tiny, low-density foci or multiple low-attenuation, 1–3 cm round lesions scattered in the liver and/or spleen. All patients an

attempt to find tissue for histological diagnosis by radiologically guided, endoscopic, laparoscopic and surgery.

The treatment procedure for paediatric patients with ATB in our hospital is chemotherapy with four antituberculous drugs (ATD), i.e. first two months their isoniazid (INH), rifampicin, ethambutol and pyrazinamide and Rifampicin for the next seven months. In the presence of peritoneal involvement, oral prednisolone was given for 8 weeks and gradually tapered over the following three weeks. All these drugs are accessible no chargeable in government hospital pharmacy. The details of treatment received, complications developed during the hospital stay, follow-up and response to antituberculous chemotherapy were also reviewed. Statistical analysis

was performed using the IBM Statistical Package for the Social Sciences v.20.0 (SPSS, IBM Corp, Armonk, NY, USA)

RESULTS

Out of total of 20,762 paediatric inpatients admitted throughout this study, 5,600 (26.97%) were established to have TB involving any one organ. ATB was found in 112 children, accounting for 2% of total tuberculous admissions. The age of the patients started from 1.3 to 12 years [Table I]. The most frequently affected age group was 6-9 years (39; 34.8%) and the least affected age group was 1-3 years (12 10.7%).

In this study parents were generally manual labourers, petty businessmen and farmers. The leading symptom at presentation was non-specific abdominal pain. It was vague, non-localised in nature and of indolent course. In particular male and Hindu prevalence was seen. Based on community-level analysis, this disease was mostly observed in the Bengali community and also migrant Nepalese. Only 9 patients presented with acute abdominal pain; 6 with features of acute intestinal obstruction and 3 with acute peritonitis [Table II]. Mean duration of symptoms before presenting to the hospital was 29.4 ± 10.8 days, and average time for diagnosis and to start ATD after initial presentation was 19 ± 8.7 days.

Table: 1 Age wise distribution of study subjects

Characteristics	Mean ± standard deviation
Age	5.3 ± 2.1
Male: female	1:0.85
Hindu: Muslim: Christian	1:0.75:0.08
Family size	5.3 ± 2.4
Per capita income of the family (Rs)	328 ± 48.3
Literacy status of father	
Literate	39(34.8)
Illiterate	78(69.6)
Literacy status of mother	
Literate	21 (18.7)
Illiterate	83 (74.1)

History of contact with tuberculosis	
In the family	49(43.7)
In neighbourhood	23 (20.5)
No history of contact	39 (34.8)
History of BCG vaccination	53(47.3)
BCG scar mark present	34(30.3)
Number of patients with PEM	106(94.6)

Table 2: Symptoms and signs at presentation

Clinical features	No of patients (%)
Symptoms	
Abdominal pain	106(94.6)
Fever	82(73.2)
Weight loss	75(66.9)
Abdominal distension	79 (70.5)
Anorexia	71 (63.3)
Alteration of bowel habits	59(52.6)
Vomiting	32(28.5)
Cough	29 (25.8)
Signs	
Distension of abdomen	97(86.6)
Mixed type (ascites, lump and diffuse peritonitis)	25(22.3)
Ascites	19(16.9)
Abdominal lump	23 (20.5)
Hepatomegaly	29(25.8)
Splenomegaly	21 (18.7)
Hepatosplenomegaly	19(16.9)
Jaundice	12(10.7)
Pedal oedema	22(19.6)
Doughy abdomen	33(19.6)
Acute abdomen	10(8.9)

Table 3: Investigation profile of patients

Investigations	Median (range)	No (%)
Haemoglobin (g/dL)	8.46 (4.60-13.20)	-
Total leucocyte count (/mm ³)	14,200 (4,200-15,800)	-
ESR	67 (22-110)	-
Serum albumin (g/dL)	2.52 (1.92-5.86)	-
Positive Mantoux test	--	39(34.8)
Accelerated BCG reaction	-	45/(40.1)
Exudative ascitic fluid	-	32/51 (62.7)
CXR suggestive of TB	-	47/112(41.9)
Multiple air -fluid levels in AXR	-	16/112(14.2)
Calcification in AXR	-	3/112(2.6)
US/CT abdomen		
Mesenteric thickening	-	33/112(29.4)
Abdominal lymphadenopathy	-	25/112(22.3)
Sputum/gastric aspirate for AFB	-	10/108 (9.25)
Mycobacterium tuberculosis grown in culture	-	12/111 (10.8)
Tuberculous granuloma in biopsy	-	23/78 (29.4)
ELISA for tuberculosis	-	18/37(48.6)
Positive ADA	-	6/7 (85.7)
Positive PCR	-	4/6 (66.6)
ELISA for HIV	-	2/32 (6.25)

Table:4 Pathological variety of abdominal tuberculosis.

Type	No%
Classic plastic	25(22.3)
Nodal	23 (20.5)
Ascitic	17(15.1)
Mixed	25(22.3)
Intestinal	22(19.6)
Hepatic tuberculosis	7(6.25)
Associated pulmonary tuberculosis	45 (40.1)
Multi -organ tuberculosis	19(16.9)
Cervical lymphadenopathy	9 (8.03)

In present study showed majority (106; 94.6%) of the children were malnourished. 15(13.3%) according patients had Grade I protein - energy malnutrition (PEM) to the Indian. Academy of Paediatrics (IAP) classification, 39(34.8%) had Grade II, 31 (27.6%) had Grade III and 20 (17.8%) had Grade IV PEM.

High incidences of anaemia (Hb < 10 g/dL), leucocytosis (total leucocyte count > 11,000/mm³), raised erythrocyte sedimentation rate (ESR) (>50 mm in the first hour) and hypoalbuminaemia (serum albumin < 3 g/dL) were observed. Primary focus in chest radiographs was found in 47% of patients. AFB could be demonstrated in ten patients and 12 patients had positive Bac Tecculture, thus making a total of 16 patients (14%) in whom the bacteria could be isolated. Biopsy specimens showed epithelioid granuloma with central caseous necrosis in 23(29.4%) patients. ELISA and PCR for TB were positive in eighteen out of 34 and four out of six patients, correspondingly. Adenosine deaminase activity in the ascitic fluid showed high values in 6(85.7%) out of 7 patients (> 33 a/v), suggestive of tubercular infection. In this study ELISA for HIV was done in 32 children, out of 2(6.25%) were positive.

Diagnostic laparoscopy was done in 8 children with vague abdominal pain. Exploratory laparotomy was done in six patients presenting with acute intestinal obstruction in this study. In present study found diffuse peritonitis with thickening of omentum, mesentery and peritoneal adhesions was the commonest type of ATB found in our study [Table IV]. A total of 106 patients (94.6%) completed nine months of drug therapy. Complete recovery, defined by weight gain, subsidence of symptoms and signs and also decrease in ESR and radiological improvement, was documented in 94 children. Jaundice and deranged liver function developed in fortyone patients.

DISCUSSION

Abdominal tuberculosis about for 2% of total TB admissions in the our study, which is correlated with the Mersha D et al (0.22-3.6%)⁹. The mean age of presentation in this study (6.4 years) was slightly younger than the reported common age group (6-11 years)⁷. While this

infection spreads through close contact, a positive family history is very likely in most cases, especially in the paediatric patients; those are highly susceptible to this infection⁸. This option is supported in our result of positive history in close family contacts in 75% of the cases.

Delay does happen in looking for medical advice, due to the indolent course of ATB and poor knowledge between the parents and primary healthcare providers. It may range from 1 month to 6 years⁹. Non-specific abdominal pain is most a frequent complaint in the current study, although abdominal distension, ascites and anorexia have also been found out as the regular presenting symptoms in some series¹⁰. Regular laboratory investigations are non-specific and do not confirm diagnosis. Yilmaz T, et al study showed high ESR in 60% and positive Mantoux test in 24% of cases¹¹ correlated with the our study 34.8%. Incidence of connected pulmonary TB (45%) in our results is comparable to findings from previous reports (19-58%) Ibrahim M, et al¹²

Paediatric ATB may recurrently imitate radiographical features such as Calcified lymph nodes, dilated and thickened bowel loops, dilatation of terminal ileum, granuloma of spleen, liver and pancreas and ascites¹³. These are the regular result in radiographs and US. The arrangement of mesenteric thickening of 15 mm along with mesenteric lymphadenopathy are famous US locating in ATB¹⁴. In the CT showed of ATB are peritoneal thickening, abdominal lymphadenopathy and thickened bowel wall, which is in line with the here series. The parallel of radiological features appeared both the adult and paediatric patients with ATB. These features are common in both age groups and it is help for exact diagnosis of ATB in children. Ascitic fluid ADA is one of the screening test in children with ATB¹⁵. Even if it was highly positive as well as its high cost.

Out of 112 children, TB could best be confirmed in forty five (40.1%) children in that twenty five had been associated with bacteria and twenty had been showed on histopathology. In our examine majority (52.17%) of the patients were diagnosed through suggestive radiological examinations and scientific development after beginning antituberculous remedy. In 14.78%, the remedy became even experimental and analysis was based totally at the

suggestive records, medical examination and presence of indirect evidence(s) of TB. Even on statistical evaluation, we did not discover any considerable difference among those 3 groups inside the clinical presentation and non-unique investigations. Pfaller MA et al have additionally faced similar difficulties inside the microbiological affirmation of the disease maximum of them depended on histopathological analysis¹⁶. Thus, we find that during most people of instances, the prognosis of ATB has to rely handiest on oblique evidences. In children with the applicable records, laparoscopy has been determined to be a totally profitable investigation¹⁷. This changed into further confirmed by means of the high fulfillment fee in histopathological diagnosis on the tissues retrieved for biopsy throughout laparoscopy within the current series.

Most of children with ATB, surgery, in an emergency or elective setting conformed by for histopathological findings. It is not 100% confirmatory, sometimes showed non-specific features in biopsy. The healing granuloma mainly appeared non-specific histology. On the other hand, in the non-intestinal variety of ATB, response to ATD is remarkable and is value a trial as soon as diagnosed. The role of laparoscopy has been capable in procuring tissue for histopathological diagnosis. It has brought down the rate of preventable laparotomies in children and its role may help extended to therapeutic purposes.

All children showed fast catch-up growth after beginning of the antituberculous chemotherapy. On of entirety,

the wide variety of PEM patients had decreased from 103 to 9. Complications have been minimal, commonest being jaundice, which possibly became drug-induced. Viral markers for hepatitis had been terrible in them.

Compared to adults, they are more vulnerable to PEM, especially in the lower rungs of the socioeconomic strata. This reduces the general immunity and in the presence of overcrowding, they become more susceptible to tuberculous infection. Although much has been investigated about the adult ATB, few studies have focused on ATB in children. The clinicians tend to believe that ATB in both age groups have parallel presentations. consequently, most physicians may really diagnose ATB in children based on the clinical features of the disease in adults. For this reason, present study was to found the clinical, radiological and laboratory features of childhood ATB, and the outcome of treatment of ATB in the paediatric population.

CONCLUSION

In conclusion, the results of this study show that the clinical features, investigations and treatment of childhood ATB are fairly related to that of the adult disease. Yet in the absence of specific investigations, diagnosis may depend on helpful laboratory and radiological investigations. Early treatment decreases morbidity. In India, where the incidence of childhood TB is very high and confirmatory exploration amenities are not uniformly available across the kingdom, a trial of ATD is a high index of distrust of ATB.

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