



## Spectrum of Abdominal Tuberculosis and its Manifestations in a Tertiary Care Centre- A Cross Sectional Study

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### Abstract

**Background and objectives:** Abdominal TB (ATB) is a form of EPTB. It is seen in about 10% of those with EPTB. HIV is an important comorbidity. This study was done to describe the clinical profile of newly diagnosed hospitalised ATB and to estimate the frequency of HIV seropositivity in these patients.

**Methodology:** Hospitalised patients newly diagnosed to have ATB based on RNTCP criteria were recruited after consent. Their clinical profile, and investigations were recorded. HIV testing was done. Statistical analysis was done for frequencies of types of ATB. The relationship between types of ATB with age, sex, HIV status, and CD4 was also determined.

**Results:** The total number of cases of ATB was 33. The mean age was 39.6 years. A male preponderance of 72.7% was seen. HIV positivity found in 8 (24.2%). The most common presenting complaints were abdominal pain and fever. Abdominal CT was the imaging done in 16(48.4%) while 13(39.4%) of the cases only USG was needed. Biopsy was done under radiological guidance in 14 of the cases (42.4%) and with laparoscopy in 1(3%). Out of all the biopsies AFB was detected in 4 (28.6%) cases. There was an association between the status of HIV and the type of abdominal TB. The most common type was abdominal lymphadenopathy (62.5%).

**Conclusion:** ATB is a common form of EPTB that has a chronic presentation. CT abdomen along with HPE and cytology is being used increasingly for diagnosis.

**Keywords:** Abdominal tuberculosis, EPTB.

### Introduction

Tuberculosis is a leading infectious disorder and is of immense public health importance. World over six million people were infected and 1.5 million people died due to TB in 2014. India bears one fourth of the global burden of TB and also accounts for the second highest HIV associated TB in the world.<sup>(1)(2)</sup>

Though the lung is the most common site of involvement; virtually any other organ system can be affected. A case of extrapulmonary TB (EPTB) is any bacteriologically confirmed or clinically diagnosed case of TB involving organs other than the lungs such as lymph nodes, pleura, abdomen, meninges, skin etc.<sup>(3)</sup> Abdominal TB (ATB) is seen in about 10% of those with EPTB and is second only to lymph node and CNS TB.<sup>(4)(5)</sup>

HIV positivity is about 16.6% in ATB. This is significantly higher than in pulmonary TB.<sup>(4)</sup>

ATB can be classified as gastrointestinal TB, peritoneal TB, abdominal lymphadenopathy and solid organ TB. If there is a combination of any of these it is considered as disseminated abdominal TB. Intestinal TB may be ulcerative, hypertrophic or fibrous stricturing. The ileocaecal region is most commonly affected. Peritoneal involvement may be ascitic, loculated (encysted), plastic (fibrous) or purulent. The lymph nodes in the small bowel mesentery and the retroperitoneum are commonly involved, and these may caseate and calcify. Rarely solid organs like the liver and pancreas and spleen may be involved. The presentation may be chronic, subacute or acute on chronic.<sup>(6)</sup>

The symptoms may be very varied depending on the pathological processes and the structures involved. The symptoms of intestinal TB are most commonly abdominal pain( 80 – 90%), weight loss( 40-70%), and loss of appetite (50-70%). Fever and intestinal symptoms are less common. In peritoneal TB the symptoms are abdominal distension, abdominal pain, fever in decreasing order.<sup>(4)</sup> The presentation could also be that of a small intestinal perforation.

All these factors make abdominal TB a masquerader. The differential diagnoses would include a wide spectrum of infections, inflammatory disorders, and malignancies. With the absence of specific clinical findings and diagnostic tools the diagnosis may be challenging. Despite the availability of newer tests like TB-PCR, GeneXpert, CT scan, EUS, capsule endoscopy, and balloon enteroscopy, laparoscopy may still have to be used to ascertain the diagnosis. Sometimes diagnosis may be made based only on response to anti tuberculous treatment or even made post mortem. Delay in the diagnosis contributes significantly to morbidity and mortality. Therefore vigilance is required. Several studies pertaining to pulmonary TB have been published, however very few studies have been done describing EPTB and

ATB. There is a paucity of data regarding the various presentations, clinical features, co morbidities, especially HIV, and diagnostic tests used for diagnosis of ATB in our country.

This study was done to describe the clinical profile of newly diagnosed hospitalised abdominal TB and to estimate the frequency of HIV seropositivity in these patients.

### Materials & Methods

Institutional ethics clearance for the study was obtained. The design was a cross sectional descriptive study. All patients admitted in our hospital between (1<sup>st</sup> September 2014-31st August 2015) who were newly diagnosed to have abdominal tuberculosis were interviewed. The cases were diagnosed based on 1) positive acid-fast bacilli smear or culture; 2). histopathology showing tubercular granuloma (with or without caseation); 3) radiologic features compatible with tuberculosis on ultrasound, or computed tomography (CT) of the abdomen; and 4) patients with a high index of clinical suspicion, with negative diagnostic workup, but who still have strong clinical evidence which was in accordance with RNTCP guidelines.<sup>(7)(8)</sup>

Informed consent was taken and then the patients were recruited. Patients who consented for the study were interviewed; all symptoms, duration of symptoms and co morbidities were recorded. They were examined. The investigations used for the diagnosis of ATB were also noted. These included biopsy and histopathology reports, ascitic fluid analysis, AFB reports, radiological investigations, and endoscopies. HIV test was done for all patients after obtaining consent. In seropositive patients the most recent CD4 count was recorded. Anti retroviral therapy (ART) status and current regimen were noted.

All Patients who were diagnosed to be ATB found to have concurrent Pulmonary TB were excluded from the study as per WHO guidelines as they would be classified as Pulmonary TB.

### Statistical Analysis

Data was entered using Microsoft XLand analysed using SPSS 16. A test of Normality was used for determination of distribution of data. Continuous normally distributed data have been represented as Mean and SD while non-parametric data have been represented with median and inter quartile range.

Categorical data have been represented as number and percentages.

Chi square/Fischer's Chi square was used to check the association between categorical variables. It was used to determine the relationship between types of ATB with age, sex, HIV status, and CD4. Independent T- test was used to compare the means of 2 independent groups while One- way ANOVA was used for 3 or more independent variables. Mann-Whitney U test and Kruskal Wallis was used for non- parametric data. A p value of <0.05 was considered to be significant.

### Results

The total number of cases of ATB was 33. The mean age was 39.6 years with a standard deviation of 11.38. A male preponderance of 72.7% was seen. There was no association between the age group or gender with the type of ATB.

The commonest type of ATB was intestinal and ascitic in equal numbers 33.3%. The frequencies of the other types of ATB have been presented in table 2.

Only 1(3%) patient had a past history of TB. HIV was the most common co morbidity and was found in 8 (24.2%). This was followed by diabetes mellitus 4(12.1%) and CKD 1(3%).

The most common presenting complaints were abdominal pain and fever followed by weight loss, bowel symptoms and abdominal distension. Surgical intervention was required in 3 (9%) of the patients as they had presented with intestinal obstruction.

Anaemia was seen in 19 (57%) patients. (Hb <11gm/dl). Hypoalbuminemia (<4.5 gm/dl) was found in 19(57%). There was no association

between haemoglobin or albumin with the type of ATB.

Abdominal CT was the imaging done in 16(48.4%) and it confirmed diagnosis while in 13(39.4%) of the cases only USG was needed. Biopsy was done under radiological guidance in 14 of the cases (42.4%) and with laparoscopy in 1(3%). Out of all the biopsies AFB was detected in 4 (28.6%) cases.

Of the 8 patients who were HIV positive, two were newly detected, 4 on first line ART and 2 on second line ART. There was an association between the status of HIV and the type of abdominal TB. The most common type was abdominal lymphadenopathy (62.5%) . The next in frequency were ascites and intestinal in equal numbers. The mean CD4 count was 194 cells/mm<sup>3</sup>. There was no association between AFB positivity and the status of HIV.

Half of those who had HIV had a CD4 count between 101 and 200. Half of the patients had the illness being detected in the last 1-3 years.

The ascitic fluid analysis yielded a cell count of 2400 (IQR 560-4700), lymphocytes 84.36% (std deviation 9.384%), and ascitic fluid protein of 5gm/dl (std dev 1). Median ADA level was 42 (IQR 32-73).

The mean ADA in HIV positive patients was 48. There was no association between the ADA levels and age, gender, HIV status, and duration of illness.

**Table 1 :** Frequency and duration of presenting symptoms

	N(%)	Median duration days (IQR)
Abdominal pain	22(66.7)	30(20-60)
Fever	18(54.5)	30 (14-112.5)
Bowel symptoms	8(24.1)	11.5(2-30)
Weight loss	7(21.2)	
Abdominal distension	3(9.1)	

**Table 2:** Types of abdominal TB

Type of ATB	Number(%)
Peritoneal TB Wet (Ascitic )	11(33%)
Intestinal TB	11(33%)
Abdominal lymphadenopathy	9(27.3%)
Dry peritoneal TB (Adhesive)	2(6.1%)

**Table 3:** Modalities used for diagnosis

	Number(%)
Cytology +radiology	11(33.3)
Radiology + histopathology	10 (30.3)
Radiology	8 (24.2)
Histopathology	4 (12.1)
Total	33(100)

**Table 4 :** Imaging modality used for diagnosis

	Number (%)
CT	15(45.5)
USG	13(39.4)
Endoscopy	4(12.1)
CT+Endoscopy	1(3)
Total	33(100)

### Discussion

Our study found that the commonest forms of ATB were ascitic and intestinal. These patients came most often with chronic abdominal pain and the diagnosis was made most often using a combination of CT abdomen with histopathology and cytology.

We found that males outnumbered females. This is similar to other studies. <sup>(9-11)</sup> However some European studies found equal preponderance among both genders. <sup>(12)</sup> This is consistent with the increased health seeking behaviour amongst males in our country.

There were mostly young adults as seen in most studies <sup>(10,11,13)</sup>.

ATB occurs as a reactivation of a dormant focus of childhood TB. That is why a young population is commonly affected.

More than half of our patients had mild anaemia as found in many other studies. <sup>(10,12)</sup> The anaemia is multifactorial and may occur due to combinations of anaemia of chronic disease, blood loss from the intestine, malabsorption and malnutrition. This explains the absence of correlation between the type of ATB and anaemia.

The most common type of ATB was peritoneal (ascites) and intestinal in equal numbers. This is a finding similar to most studies. <sup>(10,14)</sup> This was followed by abdominal lymphadenopathy and peritoneal (plastic) TB. However lymphadenopathy was more common than peritoneal TB in some studies. <sup>(9)</sup>

The commonest presenting complaint was was chronic abdominal pain. Fever was present only in about half of the patients. This observation emphasises the need for a high index of suspicion despite the absence of fever. The symptoms of most patients were chronic and had lasted for more than a month. However some patients continue to present with acute on chronic abdomen requiring urgent surgical intervention.

CT scan was the most common radiological investigation used to confirm the diagnosis. It is a very useful in delineating all forms of ATB. It has also been shown to detect more abnormalities than an USG. The next radiological investigation used was USG abdomen. This is similar to patterns world over. <sup>(4,9,15)</sup>

Ascitic fluid was low SAAG and high protein. The ADA level was high. None of the ascitic fluid smears demonstrated AFB on ZN staining. These findings are consistent with other studies done to evaluate ATB. The yield of organisms on smear and culture is low. Staining for AFB is positive in less than 3% of cases of ATB. <sup>(16)</sup> The level of ADA used in diagnosis of TB in our study is similar to the ADA levels used in other studies for diagnosis of ATB. A systematic review done of 12 prospective studies encompassing 264 patients found that ADA levels had high sensitivity (100 %) and specificity (97 %) using cut off values from 36 to 40 U/L; the optimal cut-off value was 39 U/L. <sup>(17)</sup>

HIV was the most common comorbidity and has many implications to both treatment and prognosis. The most common type of ATB found in those with HIV was lymphadenopathy. This is similar to other Indian studies. <sup>(5)</sup> <sup>(18)</sup> In the HIV positive patients studied in Shimla the second most common ATB was splenic abscess. <sup>(5)</sup> None of our patients had solid organ TB. However in Zambia the most common form of ATB in HIV was ascites. The CD4 count in these patients was (<150/ mm<sup>3</sup>) <sup>(19)</sup>. The higher CD4 count in our patients may explain the difference in presentation.

It has been postulated that the enzyme activity of ADA is more in T lymphocytes than in B lymphocytes, and is proportional to the degree of T cell differentiation. ADA is increased in tuberculous ascitic fluid due to stimulation of T-cells by mycobacterial antigen. Hence in HIV TB co-infection due to depletion of T lymphocytes, the values of ADA can be normal or low. <sup>(16)</sup> However in our study there was no significant difference in the value of ADA based on HIV status.

**In conclusion** ATB is a common form of EPTB that has a chronic presentation. CT abdomen along with HPE and cytology is being used increasingly for diagnosis. Ours is a resource poor setting and CT abdomen may not be feasible in all patients. Timely use of appropriate imaging modality along with HPE and cytology may clinch the diagnosis. HIV remains the most important co morbidity. All patients with ATB must undergo HIV testing for appropriate management.

Further studies are required with larger numbers of HIV positive ATB to determine the relationship between CD4 counts and type of ATB.

## References

1. RNTCP (DGHS) Fallis A. Tb India 2016 by RNTCP annual Report. J Chem Inf Model. 2015;1:1–60.
2. WHO TB global fact sheet [Internet]. [cited 2017 Jul 25]. Available from: <http://apps.who.int/iris/bitstream/10665/250441/1/9789241565394-eng.pdf?ua=1>
3. Central TB Division, DGHS. Guidance for TB notification in India 2012 [Internet]. Central TB division DGHS; 2012 [cited 16 September 2014]. Available from: <http://tbcindia.nic.in/WiteReadData/1892s/2362168570Guidance%20tool%20for%20TB%20notification%20in%20India.pdf>
4. Rathi P, Gambhire P. Abdominal Tuberculosis. J Assoc Physicians India ■. 2016;64.
5. Jaryal A, Raina R, Sarkar M, Sharma A. Manifestations of tuberculosis in HIV/AIDS patients and its relationship with CD4 count. Lung India. 2011;28(4):263–6.
6. Chalya PL, Mchembe MD, Mshana SE, Rambau PF, Jaka H, Mabula JB. Clinicopathological profile and surgical treatment of abdominal tuberculosis: a single centre experience in northwestern Tanzania. BMC Infect Dis. 2013 Jun 8;13:270.
7. Guidance for TB Notification in India. Cent TB Div Dir Gen Heal Serv. 2012;
8. Tinsa F, Essaddam L, Fitouri Z, Brini I, Douira W, Becher S Ben, et al. Abdominal Tuberculosis in Children. J Pediatr Gastroenterol Nutr. 2010 Jun;50(6):634–8.
9. Tan KK, Chen K, Sim R. The spectrum of abdominal tuberculosis in a developed country: A single institution's experience over 7 years. J Gastrointest Surg. 2009 Jan 3;13(1):142–7.
10. Mamo JP, Brij SO, Enoch DA. Abdominal tuberculosis: a retrospective review of cases presenting to a UK district hospital. QJM. 2013 Apr 1;106(4):347–54.
11. Kentley J, Ooi JL, Potter J, Tiberi S, O'Shaughnessy T, Langmead L, et al. Intestinal tuberculosis: a diagnostic challenge. Trop Med Int Heal. 2017 Jul 5;
12. Ramesh J, Banait GS, Ormerod LP. Abdominal tuberculosis in a district general hospital: a retrospective review of 86 cases. QJM. 2008 Jan 25;101(3):189–95.
13. Uzunkoy A, Harma M, Harma M. Diagnosis of abdominal tuberculosis: Experience from 11 cases and review of the literature. World J Gastroenterol. 2004;10(24):3647–9.
14. Hu M-L, Lee C-H, Kuo C-M, Huang C-C, Tai W-C, Chang K-C, et al. Abdominal tuberculosis: analysis of clinical features and outcome of adult patients in southern Taiwan. Chang Gung Med J. 2009;32(5):509–16.

15. Ibrahim M, Osoba AO. Abdominal tuberculosis. On-going challenge to gastroenterologists. Saudi Med J. 2005;26(2):274–80.
16. Mimidis K, Ritis K, Kartalis G, Konstantinos M. Peritoneal tuberculosis. Ann Gastroenterol. 2005;18(3):325–9.
17. Riquelme A, Calvo M, Salech F, Valderrama S, Pattillo A, Arellano M, et al. Value of adenosine deaminase (ADA) in ascitic fluid for the diagnosis of tuberculous peritonitis: a meta-analysis. J Clin Gastroenterol. 2006 Sep;40(8):705–10.
18. Debi U, Ravisankar V, Prasad KK, Sinha SK, Sharma AK. Abdominal tuberculosis of the gastrointestinal tract: Revisited. Vol. 20, World Journal of Gastroenterology. 2014. p. 14831–40.
19. Sinkala E, Gray S, Zulu I, Mudenda V, Zimba L, Vermund SH, et al. Clinical and ultrasonographic features of abdominal tuberculosis in HIV positive adults in Zambia. BMC Infect Dis. 2009;9:44.