

**STUDY OF EPIDEMIOLOGICAL FACTORS AND CLINICAL FEATURES OF SMALL  
INTESTINAL TUBERCULOSIS CASES IN TERTIARY HEALTHCARE INSTITUTE**Kshirsagar Ashok<sup>1</sup>, Khairnar Nitinchandra Dadaji\*<sup>2</sup>, Kesarwani Abhinav<sup>3</sup>, Yadav Parth<sup>4</sup>, Rakshit Rajath<sup>5</sup><sup>1</sup>Professor, Department of Surgery, Krishna Institute of Medical Sciences, Karad.<sup>2-5</sup>Resident, Department of Surgery, Krishna Institute of Medical Sciences, Karad.

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**ABSTRACT**

**Background:** Abdominal TB has been a great concern for surgeons as its prevalence has been found to be as high as 12% in cases with extrapulmonary TB. In India, TB is responsible for 5–9% of all cases of small intestinal perforations. Three types of intestinal lesions are seen: ulcerative, stricturous and hypertrophic. Ulcerative and stricturous lesions are common in the small intestine. The clinical presentation of this disease is non-specific and is a great challenge to clinicians. **Materials and methods:** The present study was a cross sectional hospital based study conducted among 38 confirmed cases of small intestinal tuberculosis (confirmed using radiological investigations) admitted under department of general surgery to study clinical presentation and epidemiological determinants associated with intestinal tuberculosis. **Results:** Majority of study subjects belonged to age group of 20-40 years (50%) followed by 40-60 years (34.21%). 73.68% cases presented with abdominal pain and anorexia, 76% cases presented with weakness, majority of the study subjects presented with low grade fever, weight loss, altered bowel habits. Some cases had history of vomiting and sense of abdominal fullness and long standing cough with expectoration. **Conclusions:** Symptoms of intestinal origin are often nonspecific and depends more upon extent of involvement and associated complications. However altered bowel habits often seems to be associated with small bowel tuberculosis.

**KEYWORDS:** Small intestinal tuberculosis, Koch's disease, Intestinal perforations, Intestinal obstruction.**INTRODUCTION**

Tuberculosis is one of the greatest public health concern and among the most common causes of morbidity and mortality in developing countries. Global burden of tuberculosis is nearly 12 million. According to World Health Organization report 2013, there were an estimated 8.6 million annual incidence of TB globally and 1.3 million people died from disease in 2012. India has the world's largest tuberculosis cases which is around 26% of the world TB cases, followed by China and South Africa. There were an estimated 0.45 million new cases of multi-drug resistant TB worldwide in 2012. More than half of these cases were in India, China and the Russian Federation.<sup>[1]</sup>

Abdominal tuberculosis (AT) was quite common in the world in the first half of the 20th century. After the advent of effective antituberculous (anti-TB) chemotherapy and improved standards of living, AT diminished in frequency, particularly as a complication of pulmonary tuberculosis.<sup>[2]</sup> Abdominal TB has been a great concern for surgeons as its prevalence has been found to be as high as 12% in cases with extrapulmonary TB. Gastrointestinal TB is the sixth most common form

of extrapulmonary TB with acute presentations (eg perforation and obstruction) and a variety of chronic problems (eg vague ill health, anorexia, weight loss, malabsorption syndrome, subacute intestinal obstruction). In India, TB is responsible for 5–9% of all cases of small intestinal perforations. Abdominal TB predominately affects young adults.<sup>[3]</sup>

The most common route of infection is by ingestion/swallowing of contaminated materials such as infected sputum or milk. The second route is via haematogenous spread from a distant primary focus (lungs) and, rarely, direct spread from the adjacent infected structures such as the fallopian tubes. After ingestion, the organism is trapped in the Peyer's patches of the small intestine and carried by macrophages through the lymphatics to the adjacent mesenteric lymph nodes, where they remain dormant. Suppression of the host defence due to malnutrition, diabetes, renal failure and immunosuppression/human immunodeficiency virus (HIV) increases the risk of reactivation of a dormant focus. Half (50%) of HIV patients with TB have extrapulmonary involvement, compared with only

10–15% of TB patients who are not infected with HIV.<sup>[4,5]</sup>

The abdominal TB usually occurs in four forms: tuberculous lymphadenopathy, peritoneal tuberculosis, gastrointestinal (GI) tuberculosis and visceral tuberculosis involving the solid organs. The gastrointestinal tract is involved in 65–78% of cases. The peritoneum and lymph nodes are commonly involved. Although gastrointestinal TB can manifest itself in the oesophagus, stomach, duodenum, appendix, large bowel and anorectal area, 12 the most common site of involvement is the ileum and ileocaecal region.<sup>[3]</sup> Inflammatory enlargement of the Peyer's patches leads to mucosal ulcerations. Enderteritis may lead to ischaemia and development of strictures. Fibrosis may follow and can result in typical 'napkin ring' strictures. Small intestinal strictures may be multiple in nature. They may present as acute or subacute intestinal obstruction clinically.<sup>[1]</sup>

Three types of intestinal lesions are seen: ulcerative, stricturous and hypertrophic. Ulcerative and stricturous lesions are common in the small intestine. Ulcerohypertrophic lesions resulting from extensive inflammation of submucosa and subserosa are mostly found in the ileocaecal region. Isolated segmental colonic TB has also been reported. Although neither clinical signs, laboratory, endoscopic findings and radiological signs nor the bacteriological and histopathological findings are gold standard for the diagnosis of abdominal TB, the diagnosis of abdominal TB is usually made by adequate radiological and histopathological studies. The methods of biopsy include endoscopic GI mucosal biopsy, image-guided percutaneous biopsy, endoscopic ultrasound guided biopsy, and surgical (open or laparoscopic) biopsy. The caseation necrosis in granulomas is the histological hallmark of TB. In intestinal tuberculosis the granulomas are multiple, larger (more than 200  $\mu\text{m}$ ) and coalescent in mucosa and submucosa. Hematologic findings are nonspecific and include raised erythrocyte sedimentation rate, anemia and hypoalbuminemia. The tubercular ascitic fluid has protein more than 3 g/dL, with a total cell count of 150-4000/ $\mu\text{L}$  and consists predominantly of lymphocytes. The ascitic fluid to blood glucose ratio is less than 0.96 and serum ascitic albumin gradient is less than 1.1 g/dL. Ascitic fluid adenosine deaminase (ADA) levels are elevated in tubercular ascites. Serum ADA level above 54 U/L, ascitic fluid ADA level above 36 U/L and an ascitic fluid to serum ADA ratio more than 0.98 are suggestive of tuberculosis.<sup>[6]</sup> The various radiological studies are used for the diagnosis of abdominal TB include ultrasonography (USG), CT, barium studies and magnetic resonance imaging (MRI).<sup>[1,3]</sup>

The present study was conducted to assess different clinical presentations of abdominal TB on the basis of

clinical course, diagnosis and outcome and hence to study its epidemiological determinants of the disease.

## MATERIALS AND METHODS

The present study was a cross sectional hospital based study conducted among 38 confirmed cases of small intestinal tuberculosis (confirmed using radiological investigations) admitted under department of general surgery to study clinical presentation and epidemiological determinants associated with intestinal tuberculosis. Patients, who were suspected to have abdominal tuberculosis through symptoms and / or operative findings, were prospectively evaluated. In addition to clinical history, their general and systemic evaluation was done. Cases were considered for required laboratory investigations. Retrospective analysis of the findings was done in order to draw conclusions and to study association between various epidemiological factors.

**Case definition of suspected abdominal tuberculosis:** patients admitted with abdominal symptoms including pain, distension, nausea, vomiting, altered bowel habit, weight loss were evaluated for tuberculosis. Radiological investigations such as ultrasound and computed tomography of abdomen were conducted for confirmation of diagnosis.

The data was collected using standard case record proforma and entered using Microsoft Excel software. The data was analyzed for descriptive statistics and analyzed using suitable tests of significance using SPSS software.

## RESULTS

The present study was conducted among 38 confirmed cases of small intestinal tuberculosis in order to study their clinical profiles and epidemiological factors associated with them. Cases of small intestinal tuberculosis, confirmed either by ultrasonography or computed tomography were considered in the present study for retrospective analysis of findings.

We studied demographic profiles of the study subjects, majority of the cases were females (57.8%) followed by 42% males. Majority of study subjects belonged to age group of 20-40 years (50%) followed by 40-60 years (34.21%) (Table 1) We assessed various modes of presentation of small intestinal tuberculosis cases in the present study. The clinical presentation was found to be variable in majority of the cases, however 73.68% cases presented with abdominal pain and anorexia, 76% cases presented with weakness, majority of the study subjects presented with low grade fever, weight loss altered bowel habits. Some cases had history of vomiting and sense of abdominal fullness and long standing cough with expectoration (Table 2). Among 57% cases, abdominal tenderness was demonstrated, while in 34% cases abdominal distension was present (Table 2). 32%

cases in the present study had past history of pulmonary tuberculosis while 13% cases had positive family history of pulmonary tuberculosis. 55% cases were living with poor housing conditions with lack of adequate ventilation and lightening. 53% cases did not practiced hygiene and sanitation practices whereas 29% cases were living in overcrowded places.

We analyzed the laboratory investigations reports of the study cases, 84% cases reported anemia of various

grades, 76% cases showed raised ESR while 39% cases demonstrated elevated leucocytes Ultrasonographic findings of cases demonstrated ascited in 34% cases whereas 31% cases demonstrated enlarged mesenteric lymph nodes and omental thickening (Table 3). The cases presented with ascites, PCR of ascitic fluid demontrated presence of AFB in 92.3% cases. 6 cases who presented with long standing cough with expectoration, 4 showed presence of AFB in sputum smear microscopy.

**Table 1: Distribution of study subjects according to their demographic characteristics.**

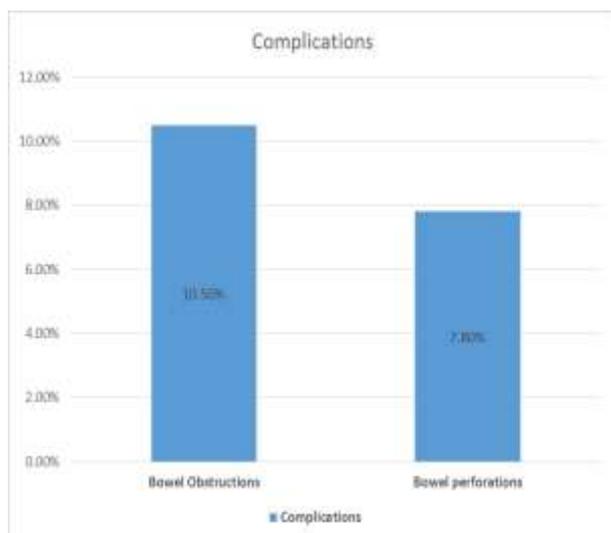
Variables		Frequency of cases	Percentage
Gender	Male	16	42.1%
	Female	22	57.89%
Age group	< 20 years	2	5.2%
	20-40 years	19	50%
	40-60 years	13	34.21%
	>60 years	4	10.52%
Total		38	100 %

**Table 2: Distribution of study subjects according to their clinical presentation.**

Variables		Frequency of cases	Percentage
Symptoms	Abdominal Pain	28	73.68%
	Weakness	29	76.31%
	Low grade fever	24	63.15%
	Weight loss	27	71.05%
	Anorexia	28	73.68%
	Altered bowel habits	26	68.42%
	Vomiting	15	39.47%
	Abdominal Fullness	13	34.21%
Signs	Cough with expectoration	6	15.78%
	Abdominal Tenderness	22	57.89%
	Abdominal distension	13	34.21%
Abdominal mass		2	5.26%
Past History of tuberculosis		12	31.57%
Family history of tuberculosis		5	13.15%
Environmental history	Overcrowding	11	28.94%
	Poor housing conditions	21	55.26%
	Lack of sanitation	20	52.63%

**Table 3: Distribution of study subjects according to their laboratory investigations results.**

Variables		Frequency of cases	Percentage
Hemoglobin levels	<9 g/dl	14	36.84%
	9-11 g/dl	18	47.36%
	>11 g/dl	6	15.78%
Raised ESR		29	76.31%
Leucocytosis		15	39.47%
USG Findings	Ascites	13	34.21%
	Enlarged Lymph nodes	12	31.57%
	Omental Thickening	10	26.31%
PCR of Ascitic fluid for AFB		12/13	92.30%
Sputum for AFB		4	10.5%



**Figure 1: Distribution of cases according to complications.**

## DISCUSSION

The clinical presentation of intestinal tuberculosis is variable and non-specific according to previous researches, and hence poses a challenge to clinicians for diagnosis just of clinical basis. The present study was conducted among confirmed cases of intestinal tuberculosis in order to assess clinical presentation of intestinal tuberculosis.

The present study finds incidence of small intestinal tuberculosis mostly between 20-40 years of age group, followed by 40-60 years. The incidence was found more among females as compared to males (however the difference is not statistically significant). Bolukbas C et al.<sup>[7]</sup> in their study observed mean age of presentation as  $31.4 \pm 15$  years and Female to male cases ration was 48/40. However Awasthi S et al.<sup>[8]</sup> and Chen HL et al.<sup>[9]</sup> found a male predominance of 61.9% and Middle-aged (30-50 years) patients with alcoholic liver cirrhosis had the highest risk.

The clinical presentation of small intestinal tuberculosis was found variable in the present study. However, majority of the cases presented with constitutional symptoms of tuberculosis, such as Generalized weakness, loss of weight, anorexia, evening low grade fever with night sweats. Many cases also presented with symptoms related to intestinal pathology, such as altered bowel habits, distension of abdomen, vomiting etc. Abdominal distension and vomiting suspects complications like ascites and intestinal obstructions. Hu ML et al.<sup>[9]</sup> also found similar results as our study, they observed that the most common clinical symptoms and signs were abdominal pain, abdominal distension, ascites and body weight loss. Bolukbas C et al.<sup>[7]</sup> in their study observed Abdominal pain among 28.4% cases, Abdominal distension among 26.1%, Diarrhea among 17% and perforation among 4.5% cases. Mamo JP et al.<sup>[10]</sup> observed that the most common clinical manifestations

among cases of abdominal tuberculosis included abdominal pain (71%), weight loss (59%), diarrhoea (47%) and pyrexia (41%).

31.5% cases had a past history of pulmonary tuberculosis, which raise a possibility of re-infection or re-activation of old focus. 13% cases also gave family history of pulmonary tuberculosis and similar percentage of cases were having active pulmonary tuberculosis presenting with cough and expectoration. Environmental factors such as lack of adequate ventilation, overcrowding, lack of hygiene and sanitation add to risk of tuberculosis. In the present study we reported above environmental risk factors in varying proportions in our study subjects. We carried out necessary laboratory investigations of study subjects in order to correlate our clinical findings, more than 80% subjects had anemia of varying severity, and majority of cases demonstrated raised ESR values (76%). 4 cases out of 6 cases who presented with cough were found positive for AFB in sputum smear examinations. Uzunkoy A et al.<sup>[11]</sup> in their study observed that the average hemoglobin was 8.2 g/dL and the average ESR was 50 mm/h (range 30-125).

Ultrasonography of the cases revealed ascites, enlarged lymph nodes, and omental thickening in various proportions. Computed tomography of abdomen, which was used for confirmation of diagnosis revealed 10.5% cases had complication of small bowel obstruction followed by bowel perforations among 7.8% cases.

## CONCLUSIONS

The present study shows the incidence of small intestinal tuberculosis more among women, and in the age group of 20-40 years followed by 40-60 years. Clinically it presents with constitutional symptoms of tuberculosis such as generalized debility, anorexia, weakness, etc. Symptoms of intestinal origin are often nonspecific and depends more upon extent of involvement and associated complications. However an altered bowel habit often seems to be associated with small bowel tuberculosis.

Epidemiological risk factors play a major role in transmission of pathogen and development of the disease by completing the epidemiological triad. In our study we observed overcrowding, lack of adequate ventilation and lack of hygiene as risk factors. A comprehensive approach which includes primary prevention (in the form of prevention and control of risk factors) and secondary prevention (in the form of early diagnosis and treatment) should be adopted.

**CONFLICT OF INTEREST:** None to declare.

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