Profile & Pattern Of Abdominal Tuberculosis: A Record Based Study

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Abstract: <u>Background:</u> Abdominal tuberculosis encompasses gastrointestinal, peritoneal and visceral forms of tuberculosis. Their clinical presentation and radiological findings are varied and non-specific, often warranting surgical intervention either for confirmation of diagnosis or for definitive management. This study aims to analyse the trend, clinical profile, diagnostic modalities, site of distribution and outcome of Koch's abdomen in non HIV infected patients. <u>Material &Methods:</u> This is a retrospective study conducted at a tertiary care teaching hospital from January 2012 to December 2019. All serologically HIV negative patients (>12 years age) with diagnosis of abdominal tuberculosis were included. <u>Results:</u> Out of 184 cases of abdominal tuberculosis, 120 patients (65.2%) were managed conservatively while 64 patients (34.7%) had undergone laparotomy. Peritoneal disease was the commonest (33.1%) followed by involvement of ileocaecal region (31.25%), ileum (21.73%), nodal & omental disease (13.58%). Resection & anastomosis was done in 43 (67.18%) patients, adhesiolysis in 13 (20.31%) patients and resection with stoma in 8 (12.5%) patients. <u>Conclusion:</u> Abdominal tuberculosis should be considered in differential diagnosis of the patients with abdominal pain. While majority of such patients can be managed conservatively, some may require surgery. Those requiring emergency surgery are at more risk to develop complications. [Shah A Natl J Integr Res Med, 2020; 11(6):11-16]

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Introduction: Tuberculosis is a chronic granulomatous disease caused by Mycobacterium tuberculosis. Global burden of tuberculosis is around 12 million[1]. India has the world's largest tuberculosis cases (26%), followed by China and South Africa[1]. The abdomen is the sixth most frequent site of extra pulmonary involvement[2]. The clinical manifestations of abdominal tuberculosis can mimic many other abdominal pathologies causing delay in diagnosis[2].

The commonest site of predilection is the ileocaecal region, attributed to the minimal digestive activity, relatively increased physiological stasis, higher rate of fluid and electrolyte absorption and more lymphoid tissue at this site[3]. Peritoneal involvement occurs due to spread of bacilli from mesenteric nodes. One third of cases show abdominal lymph node and peritoneal involvement without any evidence of gastrointestinal disease[2]. Abdominal tuberculosis presents mainly in 3 morphological forms: ulcerative, hypetrophic and ulcero-hypertrophic[4].

The most common complication of intestinal tuberculosis is intestinal obstruction due to strictures or adhesions and in India, around 3-20% of all bowel obstructions are due to tuberculosis[2]. Tubercular perforation is a serious complication causing high morbidity and mortality and it accounts for 5-9% of small intestinal perforations in India[5]. Scant literature is available on extrapulmonary tuberculosis in reference to its incidence and bacteria positivity[6]. Diagnosis of Koch's abdomen is an ongoing challenge. Most of the routine laboratory tests are nonspecific and may lead to a diagnosis of a chronic disease. Mycobacterium tuberculosis shows very low yield on microscopy or culture[2]. CT scan appears to be the imaging modality of choice in detection and assessment of abdominal tuberculosis[3].

In most cases, a trial of medical therapy should be undertaken prior to surgical intervention when feasible[7]. Surgical intervention is reserved only for complications. Antituberculous drugs give excellent results with more than 90% of the patients showing complete resolution[8]. This study aims at a better understanding of trend, clinical profile, management, complications and outcome of abdominal tuberculosis.

Material & Methods: This retrospective study was carried out at a tertiary care teaching hospital at Ahmedabad from January 2012 to December 2019. Prior approval from Institutional review board was obtained. The study included total of 184 patients having abdominal tuberculosis with negative serology for HIV. Data of these patients were obtained & analysed. Demographic profiles, clinical presentation, duration of symptoms of all the patients were

recorded. Their haematological and microbiological investigations including Mantoux test, ESR were tabulated. All patients were subjected to X-ray chest, X-ray abdomen and USG abdomen. CECT Abdomen, upper GI scopy, colonoscopy, peritoneal fluid taping, USG / CT guided FNAC or core biopsy were done as per indication & feasibility. All patients received anti-tubercular therapy as per DOTS regimen. Uncomplicated cases were managed conservatively while operative management was done for complicated cases.

Site of disease was ascertained by radiological and operative methods. Biopsies were taken from peritoneum, lymph nodes, omentum, affected bowel segments and sent for histopathological examination. Outcome of all the patients was noted. Data was then subjected to statistical analysis.

A patient was considered as having Koch's abdomen apart from clinical and radiological evidences if one of the following criteria was present:

1. Histopathological diagnosis from biopsy or FNAC (USG/CT guided, colonoscopic, surgical excision).
2. Peritoneal fluid showing presence of AFB or low SAAG (serum – ascites albumin gradient) with high ADA values (>36 units/litre).
3. Clinical and radiological response of antituberculous treatment started on basis of CECT findings of Koch's abdomen.

Results: The present retrospective study of 184 patients with Koch's abdomen was carried out from January 2012 to December 2019. Out of total 184 patients, 31 (16.85%) patients were recorded in 2012; 29 (15.76%) in 2013; 26 (14.13%) in 2014; 23 (12.5%) in 2015; 25 (13.59%) in 2016; 20 (10.87%) in 2017; 17 (9.24%) in 2018 and 13 (7.06%) in 2019. This shows slightly decreasing trend with an exception during years 2015 and 2016.

In our study, there was a wide age group of distribution. Maximum numbers of patients were between 21-40 years. Mean age was 36.9 years and median age was 35 years. There was a male predominance (M: F = 1.2:1). Most of the patients (n=147 i.e. 80%) belonged to lower socioeconomic class. Rest 37 patients (20%) belonged to middle class.

Table 1: Distribution Of Cases According To Age& Sex

Age Group (Years)	No. Of Cases			Percentage (%)
	Male	**Female**	**Total**	
<=20	14	25	39	21.20 %
21-40	44	35	79	42.93%
41-60	33	19	52	28.26%
>60	11	3	14	7.61%
Total	102	82	184	100%

On elaboration of symptomatology, 48 patients (26.09%) had symptoms for more than 6 months, 120 (65.22%) had symptoms for 10 days to 6 months while only 16 (8.69%) had symptoms for less than 10 days. History of consumption of unpasteurized milk was present in 119 patients (64.67%) as compared to 65 patients (35.33%) who consumed pasteurized milk.

Table 2: Clinical Presentation

Clinical Presentation	No. Of Cases	Percentage (%)
Abdominal Pain	184	100%
Anorexia	120	65.21%
Weight Loss	117	63.58%
Nausea & Vomiting	100	54.34%
Fever	104	56.52%
Abdominal Tenderness	106	57.60%
Abdominal Lump	34	18.47%
Ascites	23	12.50%

All patients were subjected to relevant haematological investigations including HIV serology. Chest x-ray, abdominal x-ray and abdominal ultrasound were done in all patients. ESR was done in all patients and was raised in 126 (68.48%) patients. Mantoux test was done in 137 patients and was contributory in 33 (24.09%) patients. CECT abdomen was done in 134 (72.83%) patients. Colonoscopy with biopsy was done in 20 (10.87%) patients while upper GI scopy was done in 7 (3.80%) patients. All patients (n=23) with ascites underwent diagnostic tapping. None showed presence of AFB in the fluid. SAAG and ADA levels were contributory in 18 (78.3%) patients. 25 (13.59%) patients had associated pulmonary Koch's also.

Table 3: Site of distribution of disease

Site Of Disease	No. Of Cases	Percentage (%)
Peritoneal	61	33.15%
Ileo-Cecal	58	31.52%

Region		
Ileum	40	21.74%
Nodal &Omental	25	13.59%
Total	184	100%

Out of 184 patients, 120 patients (65.22%) required conservative management while 64 (34.78%) required operative management.

Amongst the surgical candidates, 29 patients (45.31%) were operated as planned laparotomy while 35 (54.69%) underwent emergency laparotomy. Of these 35 patients requiring emergency laparotomy, 22 (11.96%) had intestinal perforations.

The surgical procedures done were – bowel resection & anastomosis in 43 patients (67.19%), adhesiolysis in 13 patients (20.31%) and bowel resection with enterostma in 8 patients (12.5%).

All patients were given antituberculous treatment as per DOTS regimen.

Table 4: Association Between Type Of Milk Consumed & Type Of Treatment

Type Of Treatment	Pasteurized Milk (N=65)	Unpasteurized Milk (N= 119)	Chi^2 Statistics	P Value
Conservative	54 (83.08%)	66 (55.46%)	14.1318	0.00017
Laparotomy	11 (16.92%)	53 (44.54%)		*(Significant)*
Laparotomy (N= 64)				
Emergency	3 (4.69%)	32 (50%)	5.2529	0.02191
Planned	9 (14.06%)	20 (31.25%)		*(Significant)*

Out of 184 patients, 31 patients (16.85%) required ICU management. 47 patients (25.54%) developed one or more complications. Out of these 47 patients, respiratory complications developed in 25 patients (13.58%), surgical site infection in 20 patients (10.86%), post-operative intestinal obstruction in 8 patients (4.34%), burst abdomen in 8 patients (4.34%) and faecal fistula in 5 patients (2.71%). Mortality rate was 3.8% (7 patients expired).

All patients underwent liver function tests (serum bilirubin, SGPT) after 3 weeks of starting of antituberculous treatment. 17 patients were found to have drug induced liver injury. They were put on alternate antituberculous regimen (streptomycin, levofloxacin, ethambutol). All patients were referred to pulmonary medicine department for dispensing the drugs and management in terms of alternate regimen prescription in cases of drug reactions.

Discussion: Extra-pulmonary TB is a significant cause of morbidity and mortality and affects lymph nodes, intestine, bone, joints, meninges, genitourinary tract, etc[2].Abdominal tuberculosis is the sixth most common form of extrapulmonary site of infection after lymphatic, genitourinary, bone and joints, miliary and meningeal TB[2]. This study shows that though trend of abdominal tuberculosis in non HIV patients is decreasing slightly, it is still quite pertinent in Indian scenario. In HIV positive patients, prevalence of Koch's abdomen is around 50%[9]. Around 15-25% of the patients with Koch's abdomen have concomitant pulmonary Koch's[10]. Any part of gastrointestinal tract, peritoneum and solid viscera can be involved.

Portal of entry of the tuberculous organisms may be via hematogenous route, ingestion of infected sputum, direct spread from infected lymph nodes and fallopian tubes[3,4]. Ingestion of infected raw (unpasteurized) milk of cattle having bovine tuberculosis may cause abdominal tuberculosis in humans. In industrialized countries, bovine TB control & elimination programs together with milk pasteurization have reduced the incidence of disease caused by M. bovis in both cattle & humans[11].

In developing countries, bovine TB is widely distributed, control measures are not applied adequately & pasteurization is not widely practised[12]. In present study, 119 patients (64.67%) had history of consumption of unpasteurized milk. More patients consuming unpasteurized milk required operative management (44.54%) as compared to 16.92% patients requiring surgery who had consumed pasteurized milk. In our study it has also been observed that 50% of patients in unpasteurized

milk consumption segment required emergency laparotomy, while only 4.69% patients in pasteurized milk consumption segment required emergency laparotomy. Despite of significant p value (<0.05) as shown in Table-4, a comment upon the direct association between consumption of unpasteurized milk and treatment aspects of abdominal tuberculosis in India can't be made. More research & data collection is needed because of paucity of data on the zoonotic aspects of M. bovis in India[13]. In the present study, 25 (13.59%) patients had associated pulmonary tuberculosis too.

Abdominal tuberculosis can affect any age group. Many studies show involvement of younger population[14,15]. Our study also shows maximum number of patients in 21-40 years age group (n = 79). The clinical manifestations of Koch's abdomen are quite varied and can mimic many other abdominal diseases, causing delay in diagnosis[16,17]. Similar to the previous studies, abdominal pain was the commonest clinical presentation in our study (100% cases). This was followed by anorexia (65.21%), weight loss (63.58%). In a study by Sharma MP et al[18], fever was recorded in half of the patients –which is in accordance with the present study (fever in 56.52% cases). In our study, 120 patients (65.22%) had their symptoms for less than 6 months but more than 10 days. 48 patients (26.09%) had their symptoms for more than 6 months. Only 16 patients (8.69%) had acute presentation with duration of the symptoms of less than 10 days.

Routine laboratory tests have very limited role in diagnosis of abdominal tuberculosis[16]. In our study, 23 (12.5%) patients had findings of pulmonary Koch's on chest x-ray. Arif Au et al and Rajput MJ et al observed concomitant pulmonary Koch's in 20% and 33.95% of their patients respectively[14,15]. Histopathology is the gold standard for diagnosis of Koch's abdomen. The caseative necrosis in granulomas is the histological hallmark of TB[2]. In our study, the diagnosis could be reached histopathologicaly in majority of cases (n=161 i.e. 87.5%). In a study conducted by Seema Awasthi et al[17], 93% patients were diagnosed histologically. Staining of AFB in ascitic fluid is positive in less than 3% of cases[2]. Ascitic fluid ADA (Adenosine deaminase) levels are elevated in tubercular ascites. Ascitic fluid ADA >36 U/L is suggestive of tuberculosis[19]. Interferon- γ levels are also raised in tubercular

ascites[20]. The sensitivity and specificity increases by combining ascitic fluid ADA and interferon -γ assay[2]. CECT abdomen is also a very useful and reliable imaging modality. It may show symmetric circumferential thickening of caecum and terminal ileum in early disease. Gross bowel wall thickening, adherent bowel loops, mesenteric lymphadenopathy and mesenteric thickening may be seen as a mass in advanced stage disease. Ileocaecal valve thickening, enlarged mesenteric nodes often with cold abscess, nodules in peritoneum and solid organs like liver may be seen. Tubercular ascitic fluid is of high attenuation value (20-45 HU) due to high cellular and protein content of fluid[21]. Immunological tests are also available as a diagnostic tool.

Because the response to Mycobacterium is variable and its reproducibility is poor, the significance of these tests is not clearly identified in clinical practice. In fact, ELISA remains positive even after therapy[22]. PCR assay of biopsied tissue or ascitic fluid is a valuable tool for detection of Mycobacterial sequences. The advantage of PCR over culture is detection of Mycobacterium within 3 days. Positive PCR signifies infection but need not be active disease[22]. Although PCR has emerged as a promising tool for diagnosing extrapulmonary TB, it is not cost effective in resource poor setting.

In our study, peritoneum was the commonest site involved (33.15%). Ayaskanta Singh et al also had reported peritoneum as the commonest site of involvement[23]. In our study ileocaecal region was involved in 31.52% cases, followed by ileum in 21.74% cases and nodal & omental involvement in 13.59% cases. According to literature, ileocaecal region is the most common site involved in gut[24]. In our study also ileocaecal region involvement was more as compared to other regions of gut. Intestinal variant presents with abdominal pain, features of sub acute intestinal obstruction or sometimes with acute obstruction and perforations. In present study, 64 (34.78%) patients required surgical intervention.

Of them, 35 patients required emergency laparotomy and rest 29 were operated as planned laparotomy. Very low incidence of perforation (0-11% in adults, 3-4% in children, 2.5-6% at autopsy and 20% of all non appendiceal perforations) has been reported in literature because of reactive fibrosis of peritoneum and formation of adhesions with adjacent tissues[5]. In

present study, incidence of intestinal perforation was 11.96% (n=22). Resection of affected bowel with end to end anastomosis was the commonest procedure done (n=43), followed by adhesiolysis (n=13) and resection with stoma (n=8). 31 patient required ICU management. 47 patients had one or more complications. Respiratory complications were most common (n=25) followed by surgical site infection (n=20), post operative intestinal obstruction (n=8) and burst abdomen (n=8), faecal fistula (n=5). Mortality rates in abdominal tuberculosis have significantly decreased from 20-50% to around 5-6% due to prompt diagnosis and use of antituberculous treatment[25]. In our study, 7 out of 184 patients had died (mortality rate 3.8%), which is in accordance with the study conducted by Ayaskanta Singh et al[23] where the mortality rate was 3%.

There are few limitations of this study. The first is that culture was not done in all patients due to the financial constraints. In this study, serial C-reactive protein (CRP) measurement was not done to assess the response to antituberculous treatment. Sharma et al. in a recent paper has shown that CRP is an ideal surrogate marker[26].

Conclusion: Abdominal Koch's is a common disease with many uncommon presentations. Clinical manifestations of abdominal tuberculosis are often protean and can mimic other abdominal pathologies. So it should be considered as a differential diagnosis in patients with vague GI symptoms. Incidence is more common in people with lower socioeconomic status. Clinical findings and routine laboratory results are usually non-specific and lead to diagnosis of a chronic disease only. Availability of newer investigational modalities has aided in its diagnosis. Availability of good antituberculous drugs and broad spectrum antibiotics has reduced the morbidity and mortality. This study provides basic outline of presentation, diagnosis and management of abdominal tuberculosis in a developing country.

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