

ABDOMINAL TUBERCULOSIS IN JAMMU DIVISION OF J & K

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Abstract

Introduction: Tuberculosis is an infectious disease that has plagued mankind since Neolithic times (8000 BC). Almost all cases of tuberculosis are caused by *Mycobacterium tuberculosis*. Tuberculosis mainly affects the people of low and middle socioeconomic status. Malnutrition, poor housing conditions, overcrowding and occupational hazards which are offshoots of poor socio-economic status are known to foster tuberculosis. Abdominal lymphadenopathy is the most common manifestation of abdominal tuberculosis and the most commonly involved lymph nodes are the mesenteric nodes. Abdominal tuberculosis (uncomplicated) is mainly managed by anti-tubercular drugs but the complications such as perforation peritonitis and acute intestinal obstruction require prompt surgical intervention followed by anti-tubercular drug therapy.

Methods: The study was a prospective study conducted in the department of General Surgery, Govt. Medical College Jammu from 1st November 2018 to 31st October 2019. All patients suspected of having abdominal tuberculosis were thoroughly evaluated and Managed as per protocol.

Results: In this study, 104 patients of abdominal tuberculosis who presented to emergency or OPD Department of General Surgery, GMC Jammu were studied. The maximum concentration of the study population was in the economically productive age group of 10-40 years, with a peak incidence in the age group of 21-30 years. The male to female ratio of the study population was 1.26. Pain abdomen was the most common presenting symptom in the study population, which was followed by vomiting (51.9%) and distension (34.6%). The most common sign in the study population was tenderness which was seen in 60 patients (57.7%). The most common procedures performed were stoma in 14 patients, adhesiolysis in 14 patients, resection anastomosis in 10 patients, resection with stoma in 4 patients.

Conclusion: Patient having acute intestinal obstruction / perforation need resection of the offending area with primary or delayed anastomosis. Our preference is for exteriorization and delayed closure of stoma till the patient is on ATT. This is because most of our patients are immunocompromised, have malnutrition and there are limitations in getting them put on TPN/ parental nutrition. Though stoma causes morbidities but the mortality is almost negligible.

Keywords: Abdominal tuberculosis, Tuberculosis of abdomen, Management of abdominal TB, Clinical presentation of Abdominal Tuberculosis

Introduction

Tuberculosis is an infectious disease that has plagued mankind since Neolithic times (8000 BC). It was recognised as a contagious disease by the time of Hippocrates (400 BC), when it was termed as '*phthisis*' (Greek Phthinien, meaning to go waste away)¹. Almost all cases of tuberculosis are caused by *Mycobacterium tuberculosis*. *Mycobacterium tuberculosis* is thin, slender, straight or slightly curved bacillus, strongly acid and alcohol fast and an obligate aerobe.

Tuberculosis mainly affects the people of low and middle socioeconomic status. Malnutrition, poor housing conditions, overcrowding and occupational hazards which are offshoots of poor socio-economic status are known to foster tuberculosis.

The various modes by which tuberculosis can involve abdomen are:

1. By ingestion of infected food, milk or infected sputum:
2. Haematogenous spread from distant tubercular focus:
3. Contagious spread from infected adjacent foci:
4. Through lymphatic channels:

The organism is swallowed and reaches the site of stasis, it passes into the mucosal gland and initiates an inflammatory process. The bacilli are then carried by phagocytosis to the submucosa where the characteristic lesion forms in the Payer's patches. Defence mechanism starts with the collection of various types of cells and tubercles are formed. Lymphangitis and endarteritis occurs which result in caseating necrosis and thereby leading to mucosal ulceration, fibrosis and narrowing of lumen. The bacilli may be carried from submucosa to mesenteric lymph nodes which may later show changes like hyperplasia, caseation, necrosis and calcification. Tuberculosis can affect all the systems of our body with abdominal tuberculosis being the sixth most common site of affection in extra-pulmonary tuberculosis after lymphatic, genitourinary, bone and joint, miliary and meningeal tuberculosis².

Abdominal lymphadenopathy is the most common manifestation of abdominal tuberculosis and the most commonly involved lymphnodes are the mesenteric nodes³.

The most common site of gastrointestinal tuberculosis is ileocecal area, followed by jejunum and colon. Esophagus, stomach and duodenum are rarely involved. Intestinal tuberculosis afflicts in three forms, i.e. ulcerative, hypertrophic or ulcero-hypertrophic and fibrous (stricture) type.

Visceral tuberculosis involves involvement of solid organs. Genitourinary system is most commonly involved followed by liver, spleen and pancreas.

Abdominal tuberculosis may present in acute, chronic or acute on chronic forms and yet many a times it may be an incidental finding. Perforation peritonitis due to bowel perforation or acute intestinal obstruction are the acute presentations of abdominal tuberculosis⁴. Abdominal tuberculosis (uncomplicated) is mainly managed by anti-tubercular drugs but the complications such as perforation peritonitis and acute intestinal obstruction require prompt surgical intervention followed by anti-tubercular drug therapy.

Material and methods

AIMS AND OBJECTIVES

1. To study the various clinical manifestations of abdominal tuberculosis.
2. To study the various diagnostic methods in abdominal tuberculosis.
3. To study the management of abdominal tuberculosis.

STUDY DESIGN

The study entitled **“EPIDEMIOLOGY, CLINICAL PRESENTATION AND MANAGEMENT OF ABDOMINAL TUBERCULOSIS”** was a prospective study conducted in the department of General Surgery, Govt. Medical College Jammu from 1st November 2018 to 31st October 2019.

INCLUSION CRITERIA

All patients suspected of abdominal tuberculosis who presented to OPD or Emergency of GMC Jammu. The study protocol included thorough history taking, general physical examination, systemic examination, meticulous abdominal examination, routine investigations and special investigations like Mantoux test, Sputum for AFB, Barium studies, Computerized Tomography(CT) scan abdomen, Ascitic fluid analysis in patients with ascites, PCR Ascitic fluid and blood for tuberculosis, Colonoscopy, Diagnostic Laparoscopy, Histopathological examination of the specimens obtained during exploratory laparotomy and /or diagnostic laparoscopy.

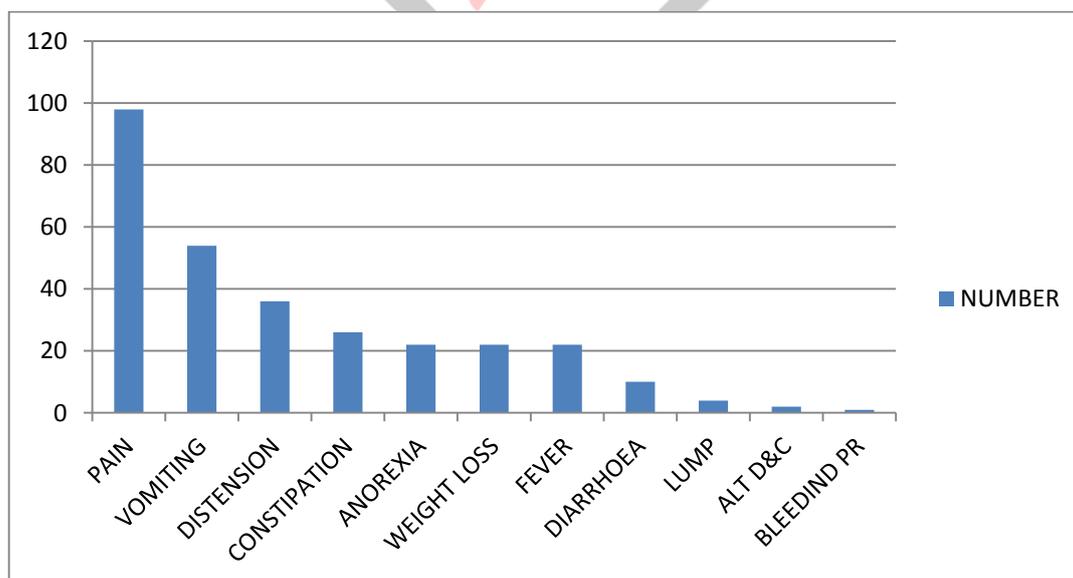
Results

104 patients of abdominal tuberculosis who presented to emergency or OPD Department of General Surgery, GMC Jammu were studied. The male to female ratio of the study population was 1.26 with 58 males as compared to 46 females. The age range of the study population was from 3 years to 70 years. The maximum concentration of the study population was in the economically productive age group of 10-40 years, with a peak incidence in the age group of 21-30 years.

Certain diseases make the host more susceptible to infection with tuberculosis. 7.7% of patients had associated pulmonary tuberculosis, 5.8% had diabetes mellitus and 1.9% had associated HIV infection.

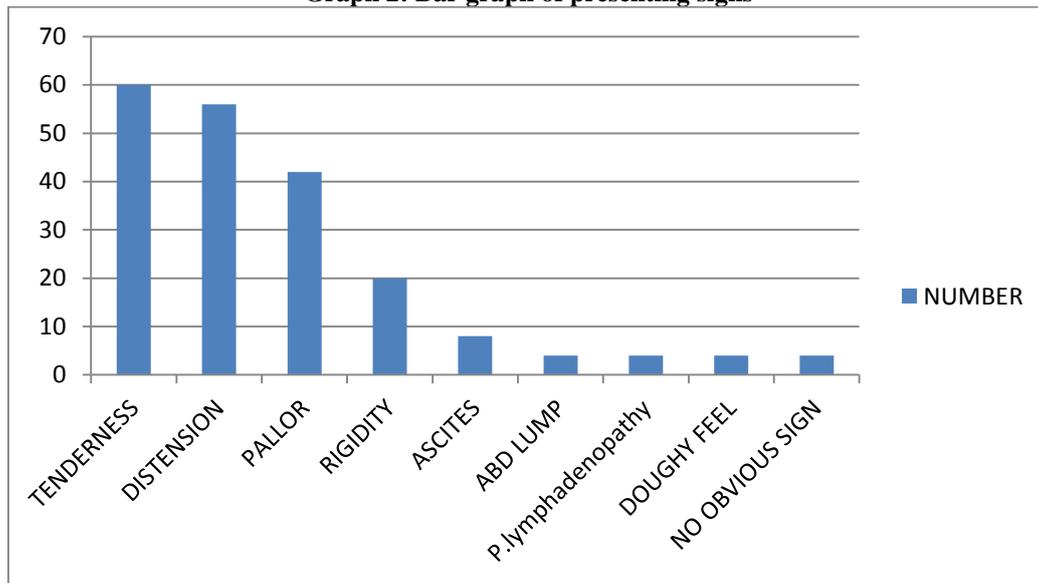
Pain abdomen was the most common presenting symptom in the study population, which was seen in 98 patients i.e. 94.2% of the study population, which was followed by vomiting (51.9%) and distension (34.6%).

Graph 1: Bar graph of presenting symptoms



The most common sign in the study population was tenderness which was seen in 60 patients (57.7%), which was followed by distension in 56 patients (53.8%) and pallor in 42 patients (40.4%)

Graph 2: Bar graph of presenting signs



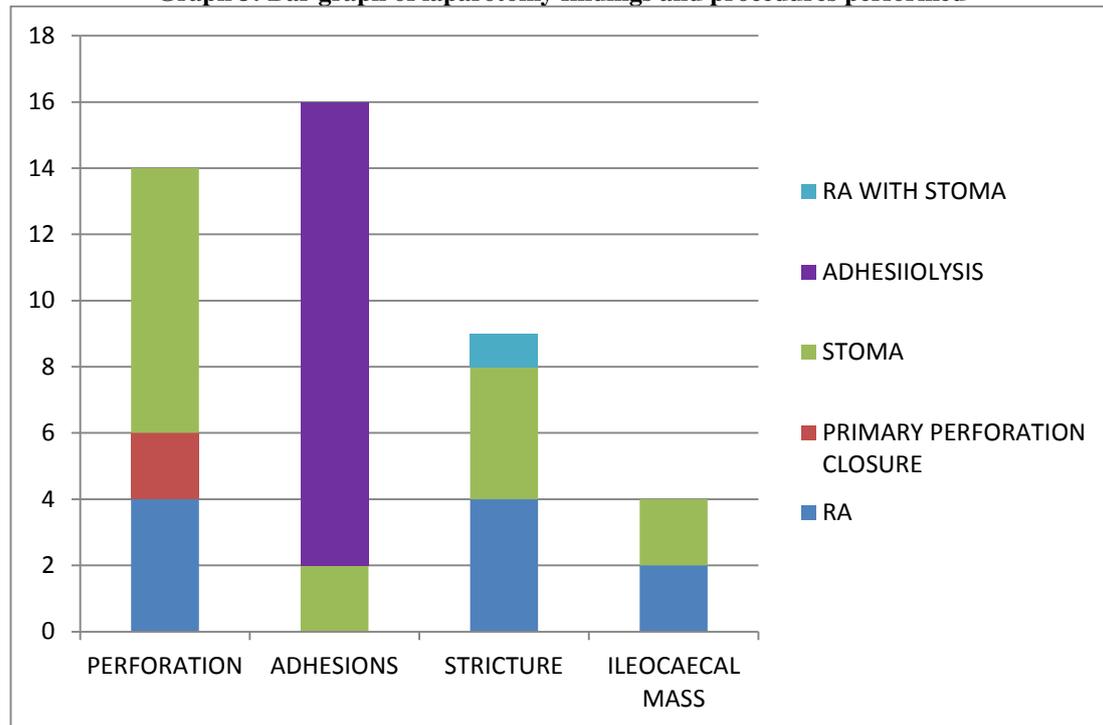
In our study 72 patients out of 104 had acute onset of symptoms while as 32 had chronic symptoms. Out of 72 patients who had acute onset of symptoms 30 were managed conservatively and 42 underwent laparotomy. In chronic group 30 patients were managed conservatively and 2 patient underwent laparotomy.

Erect chest x-ray was done in all patients and was normal in 56 patients. The most common chest x-ray finding was opacity/consolidation in 14 patients (13.5%). Pleural effusion was seen in 12 patients. Active cavitory lesions were seen in 6 patients, having active pulmonary tuberculosis. Abdominal x-ray was normal in 46 patients (44.2%). The most common abdominal x-ray finding was multiple air fluid levels, which was seen in 40 patients (38.5%), followed by free gas under diaphragm seen in 14 patients (13.5%). USG was done in 94 patients, the most common USG finding in our study was free fluid which was seen in 46 (48.9%) patients which was closely followed by dilated bowel loops seen in 38 (40.4%) patients. CECT abdomen was done in 24 patients in whom diagnosis was in doubt. CECT findings are usually an extension of the USG findings. As in USG, free fluid, dilated bowel loops and mesenteric lymph node enlargement were the most common findings. However, strictures which are difficult to appreciate in USG are easily visualized in CECT due to the use oral contrast.

Among haematological investigations ESR was done in 52 patients and was raised in 42 patients. ESR is a marker of inflammation in the body and is significantly elevated in patients with tuberculosis. ESR is not of much diagnostic value but is considered to be an index of activity of disease. Sputum for AFB was done in 92 patients and it was positive in only 6 cases. Mantoux test was done in 80 patients and was positive only in 2 patients. Ascitic fluid of 30 patients was examined for ADA levels. It was found to be raised in 26 patients and equivocal in 2 patients and normal in 2 patients. CB-NAAT was done in 24 patients and it was positive in 16 patients.

Diagnostic laparoscopy was performed in 10 patients in whom there was diagnostic delima. The various laparoscopic findings were multiple tubercles, ascites and lymphadenopathy. Various laparotomy findings in the study population were, perforation in 14 patients, bands/adhesions in 16 patients, stricture in 10 patients and ileo-caecal mass in 4 patients, two of which were having perforation, cocoon in 4 patients and 2 patients had abscess.

The most common procedures performed were stoma in 14 patients, adhesiolysis in 14 patients, resection anastomosis in 10 patients, resection with stoma in 4 patients.

Graph 3: Bar graph of laparotomy findings and procedures performed

All patients who underwent laparotomy, laparoscopy or colonoscopy underwent some sort of tissue sampling. Tissue samples were taken in 44 patients of the laparotomy group, 10 patients of the diagnostic laparoscopy group and 6 patients of the colonoscopy group. 2 patient underwent FNAC of the cervical lymph node. Only 2 out of 62 samples did not show definitive evidence of tuberculosis, but this patient was still considered as having abdominal tuberculosis on the basis of per-operative findings and clinical suspicion. The histology specimen just showed changes of chronic inflammation. The most common complication in the study population was wound dehiscence which was followed by sepsis and fecal fistula.

Discussion

Tuberculosis is one of the oldest diseases known to affect humans. Abdominal tuberculosis is quite common in this part of the world and because of non-specific presentations and delay in diagnosis, is associated with complications and therefore needs noticeable attention. The present study comprised of 104 patients of abdominal tuberculosis.

Abdominal tuberculosis mostly affects young adults. In our study most of the patients were in the age group of 21-30 years. Youngest patient was 3 years of age and oldest patient was of 70 years of age.

Das et al., (1976)⁵ in their series of 182 patients reported maximum incidence in the age group of 21-30 years followed by the age group of 11-20 years.

The male to female ratio of the study population was 1.26 with 58 males as compared to 46 females. Although the overall incidence of tuberculosis is more in males, in case of abdominal tuberculosis female patients predominate, as shown in various studies like the study conducted by **Das et al., (1976)⁵** which showed female to male ratio of 2.6.

The most common symptom in this study was abdominal pain which was seen in 98 patients i.e. 94.2% of the study population. This trend matches with various previous studies like that of **Das et al., (1976)⁵** and **Chaudhary P et al., (2016)⁶** which also had pain abdomen as most common symptom ranging from 92% to 100%.

The following table compares the symptoms between our study population and that of various studies.

Table 1: comparing presenting symptoms among various studies

SYMPTOM	Present study (n=104)	Chaudhary et al ⁶ (n=756)	Mandal et al ⁷ (n=46)	Das et al ⁵ (n=182)
PAIN	98 (94.2%)	756 (100%)	42 (92%)	170 (94%)
VOMITING	54 (51.9%)	586 (78%)	10 (22%)	125 (69.6%)
DISTENSION	36 (34.6%)	481 (64%)	12 (26%)	81 (45%)
CONSTIPATION	26 (25%)	236 (34%)	16 (35%)	85 (46.7%)
ANOREXIA	22 (21.2%)	586 (78%)	NA	80 (44.4%)
WEIGHT LOSS	22 (21.2%)	481 (64%)	38 (83%)	63 (35%)
FEVER	22 (21.2%)	496 (66%)	8 (18%)	76 (42.2%)
DIARRHOEA	10 (9.6%)	121 (16%)s	4 (9%)	20 (11.1%)
LUMP	4 (3.8%)	NA	NA	51 (28.8%)
ALT D&C	2 (1.9%)	NA	14 (31%)	16 (8.8%)
BLEEDING PR	2 (1.9%)	NA	NA	NA

The most common sign in the present study was abdominal tenderness which was seen in 60 patients accounting about 57.7%. Tenderness was closely followed by abdominal distension, which was seen in 56 patients i.e. 53.8%. The same pattern was observed by **Das et al., (1976)**⁵ in their series in which tenderness was seen in 65.9%, followed by abdominal distension in 58.2%. The average haemoglobin of the study population was 9.1g/dl with a range from 5.3 g/dl to 13.3 g/dl. Anaemia was seen in about 86% of patients. Anaemia of normocytic normochromic variety is usually seen in patients of chronic inflammation like TB. It may also be an indicator of pre-existing malnutrition which may have made the patient more susceptible to tuberculosis. **Bhansali SK (1977)**⁸ in his study observed that anaemia was a consistent feature of majority of patients of abdominal tuberculosis. More than 80% of the patients had haemoglobin level of less than 12g/dl.

Table 2: comparing Presenting signs among various studies

SIGNS	PRESENT STUDY (N=104)	Chaudhary et al ⁶ (2016) n=756	Mandal et al ⁷ (2011) n=46	Das et al ⁵ (1976) n=182
TENDERNESS	60 (57.7%)	437 (58%)	36 (79%)	110 (65.9%)
DISTENSION	56 (53.8%)	482 (64%)	18 (39.1%)	106 (58.2%)
PALLOR	42 (40.4%)	378 (50%)	NA	103 (56.5%)
RIGIDITY	20 (19.2%)	242 (32%)	NA	16 (8.7%)
ASCITIS	8 (7.7%)	121 (16%)	10 (22%)	33 (18.6%)
ABD LUMP	4 (3.8%)	77 (10%)	4 (9%)	52 (28.6%)
LYMPHADENOPATHY	4 (3.8%)	62 (8%)	NA	3 (1.6%)
DOUGH FEEL	4 (3.8%)	106 (14%)	8 (18%)	11 (6%)
NO OBVIOUS SIGN	8 (7.8%)	53 (7%)	NA	NA

ESR was done in 52 patients and was found raised in 42 patients. **Patil S et al., (2017)**⁹ in their series observed that ESR was raised in 22 patients out of 28 patients.

Chest x-ray was done in all 104 patients and was normal in 56 patients. Out of the 48 patients who had abnormal chest x-ray, many had more than one findings. The lesions can range from simple opacity or consolidation to effusion. In cases of active tuberculosis cavitory lesions may be seen. Chest x-ray may also show signs of healed tubercular infection like prominent hilar lymph nodes or fibro-bronchiectatic changes. Free gas under diaphragm was seen in 14 patients, which was indicative of perforation. Chest x-ray findings support the diagnosis of abdominal tuberculosis but a negative chest x-ray does not rule out abdominal tuberculosis.

Charokar K et al., (2016)¹⁰ in their series of 72 cases in whom chest x-ray was performed, findings suggestive of pulmonary tuberculosis was present in 6 patients, two patients had apical lesions, one had miliary mottling and 2 had right sided pleural effusion. Abdominal x-ray was normal in 46 patients (44.2%). The most common abdominal x-ray finding was multiple air fluid levels, which was seen in 40 patients (38.5%). It is in accordance with the most common presentation of tuberculosis i.e. obstruction.

Chaudhary et al., (2016)⁶ in their series of 756 patients had normal abdominal x-ray in 444 (58.7%) patients. Multiple air fluid levels in 237 (32%) patients.

The most common USG finding in our study was free fluid which was seen in 46 (48.9%) patients which was closely followed by dilated bowel loops seen in 38 (40.4%) patients. Free fluid could have been caused by peritoneal TB causing ascites, perforation or transudation of fluid in late stages of obstruction.

CECT abdomen was done in 24 patients in whom diagnosis was in doubt. CECT findings are usually an extension of the USG findings. As in USG, free fluid, dilated bowel loops and mesenteric lymph node enlargement were the most common findings. However, strictures which are difficult to appreciate in USG are easily visualized in CECT due to the use oral contrast.

Charokar K et al., (2016)¹⁰ in their series of 72 cases of abdominal tuberculosis had CECT done in only 6 cases, out of which 4 had cocoon formation and mesenteric thickening was seen in 4 cases.

Ascitic fluid of 30 patients was examined for ADA levels. It was found to be raised in 26 patients and equivocal in 2 patient and normal in 2 patient.

Colonoscopy was done in 6 patients and biopsies were taken which provided the confirmed histopathological diagnosis of the disease. Colonoscopy is a very useful investigation in patients presenting with bleeding per rectum or features of colitis.

Diagnostic laparoscopy was done in 10 patients to obtain a diagnosis. Omental biopsy was done in all the patients and was used to clinch the diagnosis. In 6 patients who had ascites, ascitic fluid analysis was done. ADA was raised in all. 1 patient had adhesion and adhesiolysis was done. **Ibrarullah M et al., (2001)**¹¹ in their series evaluated the role of laparoscopy and colonoscopy in the diagnosis of abdominal tuberculosis. Thirty four patients were diagnosed to have abdominal tuberculosis on the basis of laparoscopy or colonoscopy. Laparoscopy was performed in 23 patients. Peritoneal tuberculosis was diagnosed in 19 of them.

The study population was divided in two groups depending upon whether they presented as a case of acute abdomen or of chronic abdominal symptoms. 72 patients i.e. around 69% presented with an acute abdomen and 21% i.e. 32 patients presented with chronic abdominal symptoms. 60 patients were managed conservatively and 44 underwent laparotomy. Out of 44 who underwent laparotomy 42 belonged to acute group. Those who were managed conservatively were started with ATT.

Most of the patients undergoing laparotomy had multiple findings. Various laparotomy findings in the study population were, perforation in 14 patients, bands/adhesions in 16 patients, stricture in 10 patients and ileo-caecal mass in 4 patients, one of which was having perforation, cocoon in 4 patients and one patient had abscess. The most common procedures performed were stoma in

14 patients, adhesiolysis in 14 patients, resection anastomosis in 10 patients, resection with stoma in 4 patients. Two patients in whom adhesiolysis was done developed entero-cutaneous fistula. They were later re-explored and ileostomy was performed.

Bali RS et al., (2017)⁴ in their study of 76 patients found ileal perforation as most common intra-operative finding seen in 30.3% of patients which was followed by, in order of decreasing frequency, multiple small bowel perforation in 18.4%, solitary stricture with perforation in 11.8%, ileocaecal mass in 11.8%, adhesions and bands in 9.2%. The frequently performed procedures performed in order of decreasing frequency were ileostomy (32 patients), resection and anastomosis of the involved segment in 12 patients, primary repair of perforation (10 patients), right hemicolectomy (8 patients), adhesiolysis (6 patients), stricturoplasty (4 patients), jejunostomy (3 patients) and peritoneal and omental biopsy in 1 patient.

Conclusion

Based on the findings of 104 cases of our study and review of literature following conclusions are drawn:

1. Abdominal tuberculosis is one of the common manifestation of extrapulmonary tuberculosis with male preponderance occurring in the age group of 21-30 years.
2. Most common presentation of abdominal tuberculosis in our study was pain and only 4 patients had abdominal lump.
3. Acute presentation of disease may be in the form of obstruction / intestinal perforation needing urgent intervention.
4. In non-emergency setting, patient may need a battery of investigations including CECT, special biochemical markers for making diagnosis of abdominal Kochs.
5. In spite of specialized investigations, some patients may require diagnostic laparoscopy for confirmation of diagnosis which aids in inspection of macroscopic lesions and obtaining tissue for histopathology.
6. Patient having acute intestinal obstruction / perforation need resection of the offending area with primary or delayed anastomosis. Our preference is for exteriorization and delayed closure of stoma till the patient is on ATT. This is because most of our patients are immunocompromised, have malnutrition and there are limitations in getting them put on TPN/ parental nutrition. Though stoma causes morbidities but the mortality is almost negligible.
7. It is further emphasized that all patients of intestinal obstruction in the young age group and those presenting with non-traumatic intestinal perforation should be suspected for having tubercular pathology.
8. Patients with non specific abdominal symptoms with no obvious diagnosis on routine investigations should always be suspected of having abdominal tuberculosis and if needed diagnostic laparoscopy should be performed.
9. There is evidence of tuberculosis in the specimens of appendix which are being sent for histopathology after appendectomy. Thorough review of histopathological reports needs to be done in our setup.
10. Since the number of cases in our study were only 104, a further study with more number of cases is required to give further suggestions for the evaluation and management in our setup.

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