



Prevalence of Intestinal Tuberculosis in Cases of Sub-Acute Intestinal Obstruction

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Abstract

Background: *Sub-acute intestinal obstruction resulting from intestinal tuberculosis is more prevalent in developing countries including Bangladesh.*

Objective: *To evaluate the prevalence of intestinal tuberculosis in sub-acute intestinal obstruction in relation to age, sex, social class, occupation and residence.*

Methods: *This Prospective observational cross sectional study was done at Rangpur Medical College Hospital, Rangpur from December 2013 to June 2014 where 50 patients were selected by purposive sampling as a diagnosed case of sub acute intestinal obstruction. During the study informed written consent was taken from each of the patients or legal guardians before taking any interview. The consent form clearly describes the purpose and method of the study. After enrollment of the relevant data from history, physical examination and investigations, the information was recorded in predesigned case record form.*

Results: *The data analysis of 50 patients yielded the following results. Among the 50 patients with sub-acute intestinal obstruction, 20 (40%) patients were from 31-40 years age group followed by 41-50 years age group where the numbers of respondents were 15(30%). Male to female ratio was 4:1. 72% respondents were rural people.*

Conclusion: *Prevalence of sub-acute intestinal obstruction due to intestinal TB is increasing in TB-endemic countries such as south-east Asia. Due to the lack of characteristic specific symptoms and signs and the fact that laboratory findings are commonly non-specific or show no abnormality, diagnosis of such cases is difficult. Further studies are needed for better outcome.*

Keywords: *Sub-acute intestinal obstruction, intestinal tuberculosis, immunization.*

Introduction

Tuberculosis has been declared a global emergency by the World Health Organization (WHO) in 1995 and it is the most important

communicable disease worldwide. Approximately one third of the world population is infected and about three millions die each year from this disease. It remains the principal cause of death in

the developing countries¹²³, probably due to poverty, lack of education, low detection rate, non-availability of experienced staff and insufficient coverage of the community by immunization programme. The incidence of tuberculosis also rises in developed countries, due to the migration of people from third world countries, HIV infection and increasing use of Immuno-suppressive therapy. However, Multidrug-resistant tuberculosis (MDR-TB) arises from a mixture of physician error and patient non-compliance during treatment of susceptible TB. There should be a strong suspicion of MDR-TB, in persons with a history of prior treatment or in treatment failure cases. The disease may involve any system of the body but abdomen is one of the commonest site of involvement after lungs.

The organism responsible for causing tuberculosis in different organs was first described by German biologist "Robert Koch". The Koch's bacillus' was later on called as Tubercle bacillus'. There are two species of mycobacterium which cause Tuberculosis in human being, the mycobacterium tuberculosis hominis and mycobacterium tuberculosis bovis.

These bacteria cause disease mainly in immune compromised individuals. The primary intestinal tuberculosis is due to ingestion of contaminated food with tubercle bacilli. It may be infected milk

of animal or food contaminated with saliva of infected person.

The disease is secondary when the swallowing of infected sputum from an active cavitating primary focus in the lungs causes it. The mesenteric lymph nodes and peritoneum are involved secondarily in the bacteriemic phase that can occur during active primary pulmonary tuberculosis.

The mycobacteria cause chronic disease with a characteristic granulomatous lesion containing collection of epithelioid cells and langerhan's giant cells, but caseation occurs only in tuberculosis. There are two common types of abdominal tuberculosis; intestinal tuberculosis and tuberculous peritonitis. Rarely the third entity, is the tuberculous lymph adenitis.^{[1][2][3]}

Worldwide, one person out of three is infected with Mycobacterium tuberculosis, two billion people in total. The disease usually affects the lungs although in up to one third of cases other organs are involved. It can involve any part of the gastrointestinal tract from mouth to anus, the peritoneum and the pancreatobiliary system. It has a wide variety of presentation, frequently mimicking other common and rare diseases. Abdominal tuberculosis is predominantly a disease of the young adult.

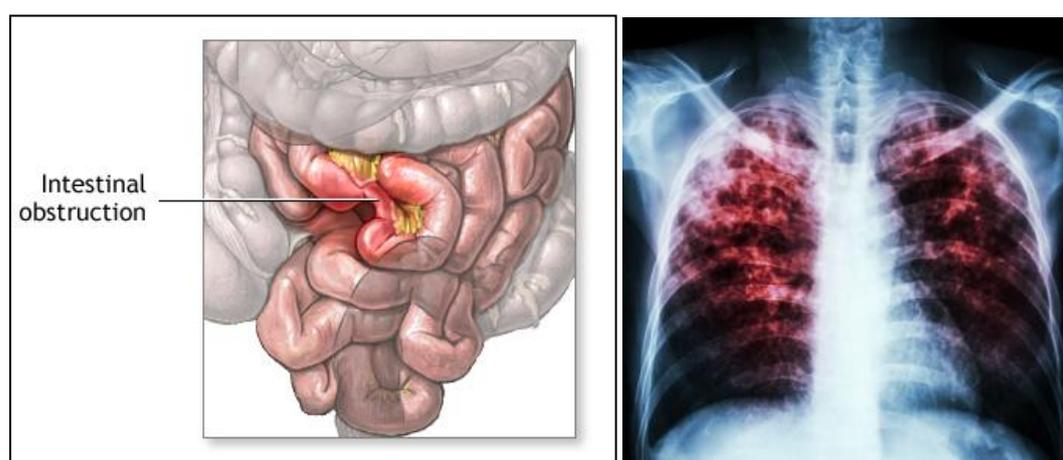


Figure-1a and 1b: Sub-acute intestinal obstruction and tuberculosis^[4]

The most common site of involvement is the ileocaecal region. The classic histological finding is a caseating granuloma. In this study our main

goal is to assess the prevalence of intestinal tuberculosis in sub-acute intestinal obstruction in

relation to age sex, social class, occupation and residence.

Objective

General objective

- To evaluate the prevalence of intestinal tuberculosis in sub-acute intestinal obstruction in relation to age sex, social class, occupation and residence.

Specific Objectives

- To study the clinical and pathological characteristics of patients with intestinal tuberculosis and to discuss methods needed to reach the diagnosis.
- To confirm intestinal tuberculosis as a cause of sub-acute intestinal obstruction by histopathological examination.

Methodology

Study type

- This study was a prospective cross sectional Study.

Study setting and Period

- This study was done in Rangpur Medical College Hospital from December 2013 to June 2014.

Source of Materials

- Materials of the study were our admitted patient in all five unites of General Surgery as well as Gastroenterology and Pediatric Surgery ward. Those patients who had sub-acute intestinal obstruction were included in this study. A total 50 admitted patients with diagnosed sub-acute intestinal obstruction were selected for the study. This is a prospective study conducted in 7 months period.

Sample size

- Sample size was selected using the following statistical formula : $n = Z^2 pq / d^2$

Here, n = sample size,

Z = 1.96 (at 95% confidence level)

p = the proportion of intestinal tuberculosis in cases of sub-acute intestinal

obstruction is 03-25% in Indian subcontinent.

$$q = 1-p = 1.0.03 = 0.97$$

d=degree of accuracy desired, usually set at 0.05

$$\text{Calculation: } n = Z^2 pq / d^2$$

$$\frac{1.96^2 \times 0.03 \times 0.97}{0.05^2}$$

$$0.05^2$$

$$= 3.84 \times 0.97 \times 0.03 / 0.0025$$

$$= 44.59$$

Therefore the minimum required sample size, n = 45. But as these patients are available in our country, so we take sample size as 50.

Purpose and method of the study

After enrollment of the relevant data from history, physical examination and investigations, the information was recorded in pre-designed case record form. Management modalities include conservative, peri operative and post operative events with complications and follow-up; all were recorded in document sheet specially prepared. Initially most of these patients were relieved by conservative management that is, by keeping them abstained from oral diet, naso-gastric suction and parenteral supplementations. Significant relief was within the period of 6 hr to 48 hr. The patient who had acute symptoms of obstruction with no relief in 6 hours were put in the category of acute intestinal obstruction and were not included in the study.

Sampling Techniques

- Samples were taken from only admitted patients in Surgery department who had sub-acute intestinal obstruction followed by clinical and laboratory evidence. So, a non probability purposive sampling was done.

Inclusion criteria

- Patients, who gave written consent, willing to comply with the study procedure are included.
- 2) All admitted patients who were diagnosed as sub-acute intestinal obstruction.

Exclusion criteria

- Patients with acute intestinal obstruction.

Methods:

- After admission data for my study was collected by-
 - Direct interview from the patients and their relatives, accompanying persons with detailed history.
 - Thorough clinical examination
 - Clinical findings and relevant investigations (ultrasonogram. Plain X-ray abdomen) performed over the patient.

After initial resuscitation of the patients, thorough assessment of the patients were done. Documentations of the patients that included identification, history, clinical findings, investigations, operative findings, post operative outcome, complications during the stay in hospital and during subsequent follow up of the patients, all were recorded in a specially prepared proforma, Demographic data were collected including age, sex, occupation, clinical findings, investigation findings, peroperative findings, hospital stay etc.

Statistical data analysis

- The statistical analysis was performed using statistical package for social science (SPSS) version 12.0 for Windows (SPSS, Chicago IL, U.S.A). The mean + standard deviation (SD), median and ranges were calculated for continuous variables whereas proportions and frequency tables were used to summarize categorical variables. Chi-square (χ^2) test were used to test for analysis.

Results

In table-1 shows Distribution of age $n=50$ where out of 50 patients maximum patients belong to age group 31-40 years (40%) followed by age group 41-50 years (30%). The minimum number of patients was from 9-20 years age group (6%). According to mean age, the affected male patients were a little younger than the female patients. The following table is given below in detail:

Table-1: Distribution of age $N=50$

Age group (years)	No of patient		Total (%)
	Male (n=40)	Female (n=10)	
9-20	02(5%)	01 (10%)	03 (6%)
21-30	05(12.5%)	01 (10%)	06 (12%)
31-40	17(42.5%)	03(30%)	20(40%)
41-50	12(30%)	03(30%)	15(30%)
51-60	01(2.5%)	02(20%)	03(6%)
>60	03(7.5%)	00(0%)	03(6%)
Total	40 (80%)	10 (20%)	50(100%)
Mean age \pm SD	34.49 \pm 7.54	37.20 \pm 5.89	

In figure-2 shows gender distribution of the patients where most the patients were male 80%

and female were less 20%. The following figure is given below in detail:

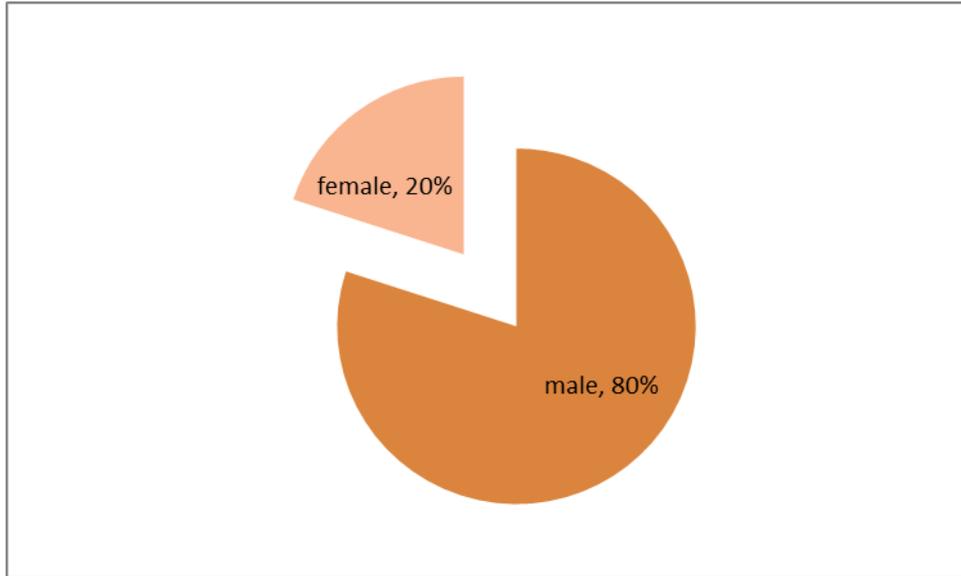


Figure-2: Gender distributions

In figure-3 shows distribution of the patients according to residential area where most of them were inhabitant to rural area 72% and 28%

inhabitant to urban area. The following figure is given below:

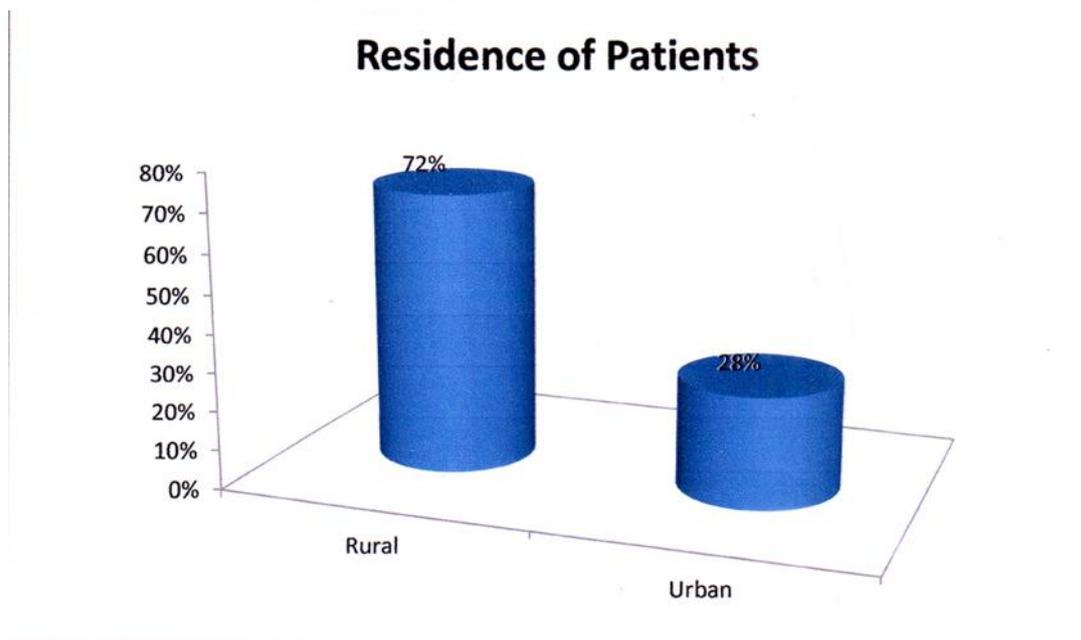


Figure-3: distribution of the patients according to residential area

In figure-4 shows distribution of socioeconomically status where out of 50 patients 76% were from lower class followed by 20% and

4% upper class. The following figure is given below in detail:

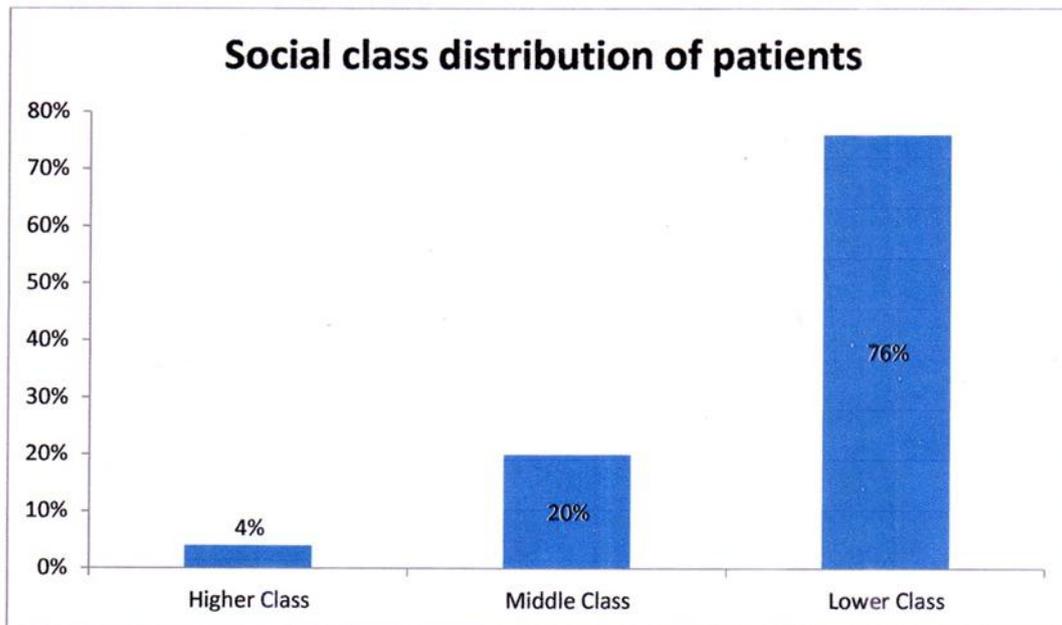


Figure-4: social class distribution of patients.

In figure-5 shows distribution of the patients according to occupation where highest number of the patients were service holder 61.54%. But in this study maximum patients were doing job in

BIRI factories in Rangpur zone. The minimum number of the students was businessman and student. (7.69%) The following figure is given below in detail:

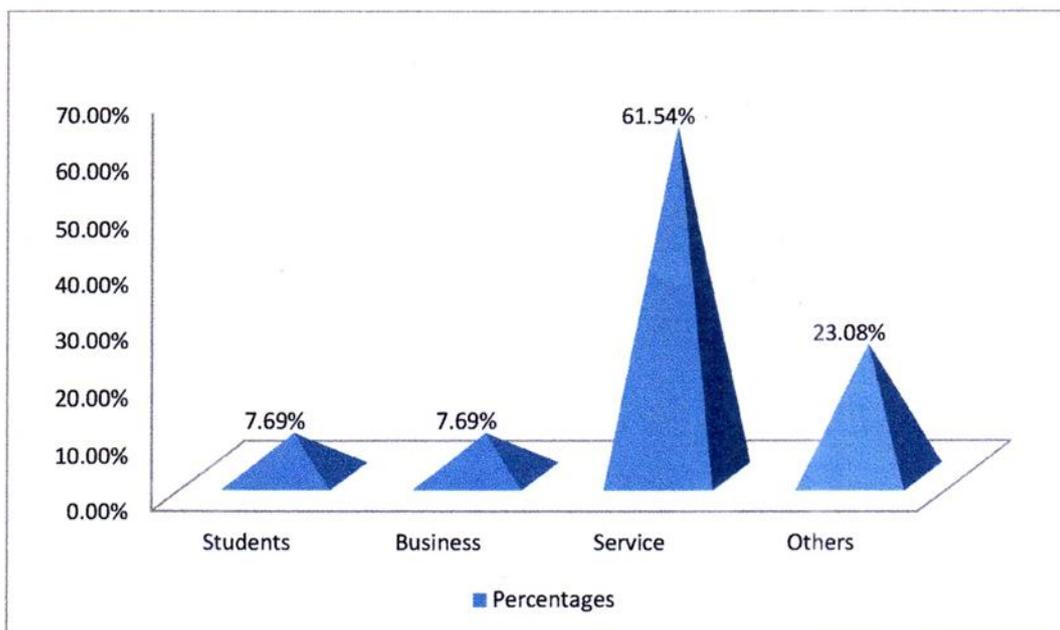


Figure-5: distribution of the patients according to occupation

In table-2 shows different causes in patients with sub-acute intestinal obstruction n=50 where Bands and adhesions was common causes in our

Table-2: Different causes in patients with sub-acute intestinal obstruction (n=50)

Age group (years)	Number of patients	Percentage (%)
intestinal tuberculosis	13	26
Bands and adhesions	16	32
Colonic carcinoma	11	22
Meckel's diverticulum	3	6
Crohn's disease	2	4
Incisional hernia	4	8
Traumatic diaphragmatic hernia	1	2
Total=	50	100

In figure-6 shows Prevalence of intestinal Tuberculosis in our study population(n=50) where in the 7 months of the study period total 50 patients were admitted with the diagnosis of subacute intestinal obstruction. Among them 13 were finally diagnosed as intestinal tuberculosis.

The following table is given below in detail:

According to formula of prevalence, the prevalence of ITB among the subacute intestinal obstruction the rate of prevalence as like follows- Prevalence rate of ITB==26%. Among 13 patients 46.54% revealed associated intestinal Tuberculosis. The figure is given below in detail:

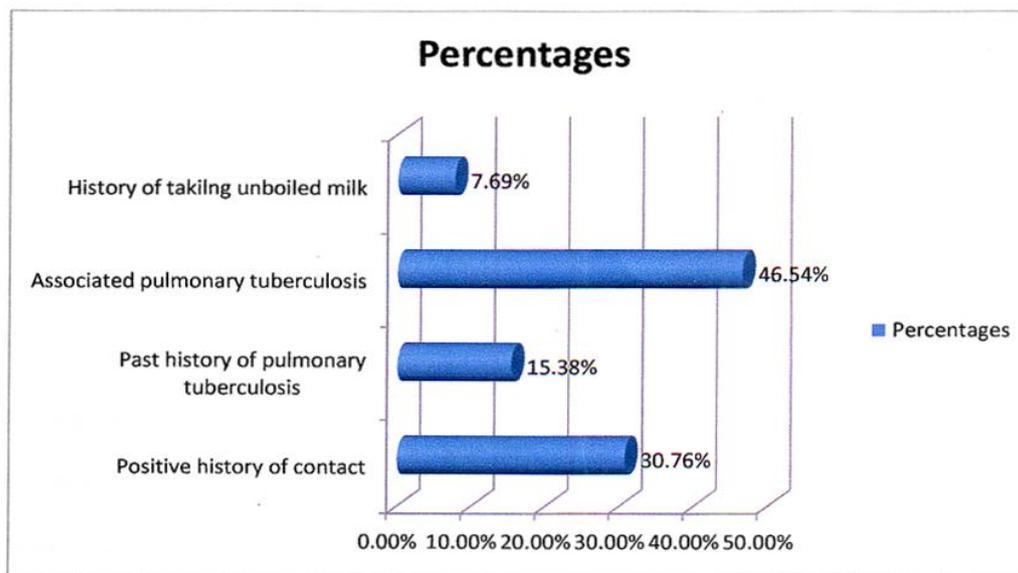


Figure-6: Prevalence of intestinal Tuberculosis

In table-3 shows Clinical Features of Study Population (n=50) where Out of 50 patients all patients were admitted with abdominal pain followed by weight loss (28%). The minimum

Table-3: Clinical Features of Study Population (n=50)

Symptoms & Signs	Number of patients	Percentage (%)
Abdominal pain	50	100
Weight loss	28	56
Visible peristalsis	26	52
Low grade Fever	26	52
Vomiting and nausea	22	44
Mass in the lower quadrant	7	14
Ascites	4	8
Cough and sputum	3	6

number of people were admitted with cough and sputum (6%).The following table is given below in detail:

In table-4 shows Investigation findings among the patients with intestinal tuberculosis (n=13) where maximum patients diagnosed as intestinal tuberculosis with sub-acute intestinal obstruction

proclaimed anemia (84.61 %) followed by significant findings in plain x-ray abdomen and histopathology (76.92%).

Table-4: Investigation findings among the patients with intestinal tuberculosis (n=13)

Laboratory findings	Number of patients	Percentage (%)
Laboratory parameter:		
Anaemia	11	84.61
Elevated ESR	09	69.23
Imaging:		
X-ray abdomen in erect posture (dilated loops with air fluid level)		
Barium meal and follow through (stenotic lesions)	10	76.92
08		61.54
Ultrasound findings:		
Mass in right iliac fossa	06	46.15
Dilated loops and enlarged mesenteric lymph nodes.	09	69.23
Free fluid in peritoneal cavity	04	30.76
Colonoscopy:		
Showing ulcers, nodules or strictures.	09	69.23
Histopathology		
Caseating granulomatous lesion.	13	100

In table-5 shows operative findings/Pathological characteristics among the patients with intestinal Tuberculosis (n=13) where According to pathological characteristics, small bowel stricture was the commonest manifestation (61.54%)

followed by multiple macroscopic nodules (53.84%). The minimum number of patients showed ascitic fluid and multiple adhesions (28.57%).The following table is given below in detail:

Table-5: Operative findings / Pathological characteristics among the patients with intestinal Tuberculosis (n= 13)

Operative findings	Frequency	Percentage (%)
Small bowel strictures (single/multiple)	08	61.54
Multiple macroscopic nodules	07	53.84
Ileocaecal mass	05	38.46
Enlarged mesenteric lymph node	05	38.46
Ascitic fluid	04	28.57
Adhesions	04	28.57

In figure-7, shows duration of hospital stay of the patients where maximum patients stay 11-20 days

(60%). The following figure is given below in detail:

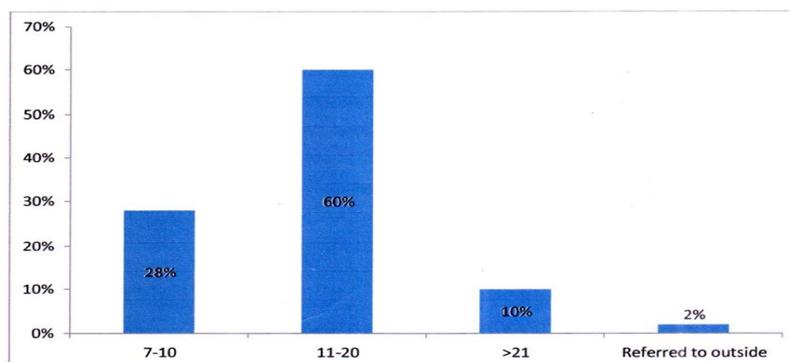


Figure-7: Duration of hospital stay of the patients

Discussion

Intestinal tuberculosis is not an uncommon clinical problem in developing countries and also reemerging in the developed countries due to its association with acquired immunodeficiency syndrome. More than hundred years have passed since the identification of the organism. Still the disease is a worldwide problem. Intestinal tuberculosis is an important cause of morbidity in the Bangladeshi population, because the diagnosis is delayed. It is rightly termed as a continuing problem.

Tuberculosis has re-emerged as a devastating disease during the last decade with a high morbidity and mortality. Bangladesh among with other five nations account for more than 50% of tuberculous cases worldwide. The disease is considered to be the fourth major cause of all deaths in Pakistan and the second commonest cause of intestinal obstruction^[5] TB of the gastrointestinal tract is the sixth most frequent form of extra-pulmonary site^[6]

It has varied presentation, frequently mimicking other common and rare diseases. This study reports the socio-demographic factors, prevalence and clinical presentation which would help the physician to diagnose and treat this curable disease. From the 50 patients, 40 (80%) were male and 10 (20%) were female. Male and female ratio was 4:1. On e study also showed male predominance in his study. Here most of the patients were in the age of 31-40 years and average age was 34.49 ± 7.54 years, which is similar to other study^{[6][7]}. A previous study from our country also reported similar type of results. It is also known that two thirds of the patients with intestinal TB are 21-40 years old. In this study we found such an observation. Common presentation were, abdominal pain (100%), low grade fever (52%), weight loss (56%), nausea and vomiting (44%), which were similar to other report.^[8] Abdominal lump and abdominal lymphadenopathy were 14% whereas another study found 16.8 % tuberculosis lymphadenitis^[9] and other study showed abdominal mass 13%.^[10]

In this series average Hb% was 8.5 gm/dl which were similar to other study.^{[9][11]} Plain X-ray abdomen showed significant abnormalities in 76.92% cases other study found abnormal findings in the same series of x-ray in case of 75% of the patients.^[12] USG revealed abnormality in 69.23% of cases and predominant findings were dilated loops and enlarged mesenteric lymph nodes. In 46.15% cases, right iliac fossa mass and in 30.76% cases free fluid of ascites which is similar to other study.^[13] Colonoscopy revealed nodularity and ulceration in 69.23%, and narrowing in 6% of cases which is similar to other study.^[12] So ulcerative lesion is common in intestinal TB. Ascitic fluid study revealed exudative fluid with lymphocyte predominance but no AFB was found. Histopathology reports were consistent with granulomatous lesion that means tuberculosis in 100% cases. In this study no patients with intestinal tuberculosis died, out of 13- All presented late with sub-acute intestinal obstruction, 46.54% had associated pulmonary tuberculosis. Different studies quote a mortality rate associated with gut perforation ranging from 11 % to 45%^[14] The management of abdominal TB requires conventional anti TB for at least 6 months including initial 2 months of rifampicin, INH, Pyrazinamide and Ethambutol. in our study though all the patients were treated with 6 month regime.

Limitation

- > This is single blinded, single centered study.
- > Duration is short.
- > Sample size is small.
- > Does not proclaim the scenario of whole country

Recommendations

- A multicentered double blinded study in the divisional/ tertiary hospitals of whole Bangladesh can reveal the real picture of intestinal tuberculosis in case of subacute intestinal obstruction.
- The study period should be long.

- Multi disciplinary approach of research work can make a study precise & more authentic in this regard.
- The whole country patient's conditions should be recorded so that we can generate a protocol as a national guideline for effective management of intestinal tuberculosis.

Conclusion

Intestinal tuberculosis is one of the major causes of morbidity and mortality in the developing countries. It mostly presents as acute abdomen in the form of sub-acute intestinal obstruction with the signs and symptoms of intestinal obstruction or perforation. The patients usually admitted in surgery with sub-acute intestinal obstruction are mostly from low socioeconomic status with low education profile. Male are mostly affected due to more exposure in outdoor work.

A high index of suspicion, proper evaluation, and therapeutic trial in suspected patients is essential for an early diagnosis and timely treatment, in order to decrease the prevalence of complications. The core message in this study is that diagnosing intestinal TB entails a clinical challenge and should hinge on bearing a great awareness of the disease by physicians.

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