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ORIGINAL ARTICLE

Anatomical Site Distribution of Histopathologically Confirmed Intestinal Tuberculosis in Surgically Managed Patients

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ABSTRACT

Introduction: *Intestinal tuberculosis is one of the common forms of extrapulmonary tuberculosis in endemic countries and frequently presents with nonspecific clinical features, making early diagnosis challenging. Knowledge of the common anatomical sites of involvement is important for accurate diagnosis, appropriate surgical planning, and effective patient management. The present study was undertaken to determine the anatomical site distribution of histopathologically confirmed intestinal tuberculosis in surgically managed patients.* ***Methods & Materials:*** *This descriptive cross-sectional observational study was conducted in the Department of Surgery of Uttara Adhunik Medical College Hospital (UAMCH) and Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh, from January 2015 to December 2015. Purposive sampling was employed, and 30 histopathologically confirmed intestinal tuberculosis patients were included in the study. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 20.0.* ***Result:*** *The mean age of the patients was 31.1 ± 9.7 years (range: 15–58 years), with the highest 40.0% belonging to the 21–30-year age group. Abdominal pain (83.3%), weight loss (76.7%), and fever, malaise, and anorexia (60.0%) were the most common presenting symptoms, while pallor (86.7%), distended abdomen (63.3%), and abdominal tenderness and palpable abdominal mass (56.7% each) were the predominant physical signs. The ileocaecal region was the most frequently involved anatomical site (56.7%), followed by the ileum (20.0%), whereas isolated involvement of the caecum (10.0%), colon (10.0%), and jejunum (3.3%) was relatively uncommon.* ***Conclusion:*** *The ileocaecal region was identified as the most commonly involved anatomical site, followed by the ileum, whereas isolated lesions of the caecum, colon, and jejunum were relatively infrequent. These findings reaffirm the characteristic predilection of intestinal tuberculosis for the ileocaecal region and highlight the importance of maintaining a high index of suspicion in patients presenting with lesions at this site.*

Keywords: *Intestinal Tuberculosis, Anatomical Site, Histopathology*

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INTRODUCTION

Intestinal tuberculosis (ITB) remains an important diagnostic and surgical problem in South Asia, where the burden of tuberculosis is still high and concentrated within the WHO South-East Asia Region. WHO reported that the South-East Asia Region accounted for about 45% of incident TB cases globally in 2023, and the region continues to carry a disproportionate burden in 2024 [1,2]. Abdominal TB is less common than pulmonary TB, but it still represents about 1%–3% of all TB cases and roughly 6%–13% of extrapulmonary TB, with wide geographic variation [3]. In high-burden countries such as India and Pakistan, abdominal disease forms a meaningful share of extrapulmonary TB, underscoring the clinical relevance of this condition in South Asia [4]. This burden is important because abdominal and intestinal TB often mimic other common surgical and gastrointestinal diseases, leading to delayed diagnosis and avoidable morbidity [3-6]. Anatomically, ITB can affect any segment of the gastrointestinal tract from the oesophagus to the anus, but the ileocecal region is the commonest site of involvement. A systematic review and major contemporary reviews reported a clear predilection for the ileocecal area, terminal ileum, and adjacent colon, with ileocecal involvement occurring in about 44%–84% of cases [3-5]. In a London series, the ileocaecum was involved in 44% and the small bowel in 34% of patients, showing that even in low-burden settings the same anatomical pattern persists [3]. Clinically, patients usually present with nonspecific symptoms such as abdominal pain, weight loss, fever, altered bowel habits, abdominal distension, obstruction, or a palpable mass, which makes ITB difficult to distinguish from Crohn's disease, malignancy, or other surgical abdomen conditions [3-6]. Conventional microbiology and molecular tests often have limited sensitivity in intestinal specimens, so tissue diagnosis remains central to confirmation [5-7]. Surgery is usually required when ITB presents with intestinal obstruction, perforation, strictures, acute abdomen, or diagnostic uncertainty, and operative specimens often provide the clearest opportunity for histopathological confirmation. This is why surgically managed patients are particularly valuable for studying the anatomical distribution of histopathologically confirmed ITB: they allow direct mapping of disease sites, documentation of the most frequently involved bowel

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segments, and correlation of anatomical involvement with operative findings [6,8-10]. Such information is especially relevant in South Asia, where late presentation and a high background burden of TB make operative diagnosis and management more common than in low-incidence settings [4,8-10]. Therefore, the present study on the anatomical site distribution of histopathologically confirmed ITB in surgically managed patients is important for improving preoperative suspicion, refining surgical planning, and strengthening early recognition of this endemic but still underdiagnosed disease.

METHODS & MATERIALS

This descriptive cross-sectional observational study was conducted in the Department of Surgery of Uttara Adhunik Medical College Hospital (UAMCH) and Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh, from January 2015 to December 2015 to assess the pattern of surgical procedures performed for histopathologically confirmed intestinal tuberculosis. The study population comprised patients of all ages and both sexes who underwent surgical treatment for intestinal tuberculosis during the study period. Purposive sampling was employed, and a total of 30 patients fulfilling the selection criteria were included in the study. Patients with histopathologically confirmed intestinal tuberculosis were enrolled, whereas patients with abdominal diseases other than tuberculosis, intestinal tuberculosis associated with concurrent malignancy, those without diagnostic evidence of intestinal tuberculosis, and patients receiving irregular anti-tubercular therapy were excluded. Data were collected using a structured questionnaire through direct interviews, physical examination, review of laboratory investigations, operative findings, histopathological reports, and relevant hospital documents. The collected information included demographic characteristics, presenting symptoms, physical signs, intraoperative findings, anatomical site of disease, and the surgical procedures performed. All data were checked for completeness and analysed using the Statistical Package for Social Sciences (SPSS) version 20.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages in tables and figures where appropriate. Ethical approval was obtained from the concerned institutional authority before commencement of the study. Participation was entirely voluntary, and informed written consent was obtained from all participants or their legal guardians after explaining the objectives and procedures of the study in Bengali. Participants were assured of their right to refuse or withdraw from the study at any time without affecting their treatment, and strict confidentiality of all collected information was maintained throughout the study.

RESULTS

In this study, 12 (40.0%) were male, and the remaining 18 (60.0%) were female.

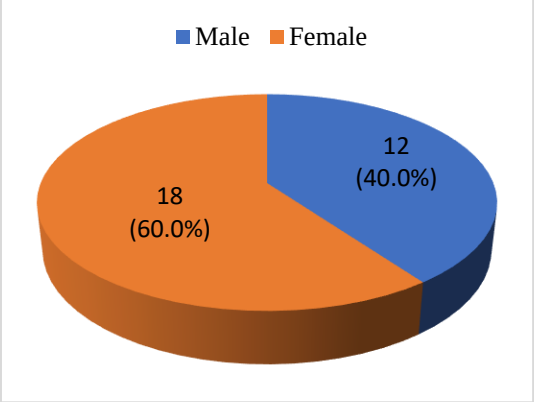


Figure 1: Pie chart shows sex distribution of the study subjects

The highest proportion of patients belonged to the 21–30 years age group, comprising 12 (40.0%) patients. This was followed by the 31–40 years age group with 8 (26.7%) patients and the ≤20 years age group with 5 (16.7%) patients. The 41–50 years and 51–60 years age groups included 3 (10.0%) and 2 (6.6%) patients, respectively. The mean age of the study patients was 31.1 ± 9.7 years, with an age range of 15 to 58 years (*Table I*).

Table I: Age Distribution of the Study Patients (*n* = 30)

Age Group (years)	n	Percentage (%)
≤20	5	16.7
21–30	12	40.0
31–40	8	26.7
41–50	3	10.0
51–60	2	6.6
Total	30	100.0

Abdominal pain was the most common symptom, reported by 25 (83.3%) patients, followed by weight loss in 23 (76.7%) patients and fever, malaise, and anorexia in 18 (60.0%) patients. Constipation was present in 16 (53.3%) patients, while a lump in the abdomen was reported by 12 (40.0%) patients. Vomiting occurred in 8 (26.7%) patients, and diarrhoea alternating with constipation was observed in 7 (23.3%) patients. Diarrhoea and cough with expectoration were reported by 5 (16.7%) and 4 (13.3%) patients, respectively. It was also observed that 26 (86.7%) patients had pallor on physical examination, making it the most common clinical sign (*Table II*).

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Table II: Distribution of the Study Patients by Symptoms (*n* = 30*)

Symptom (overlapped)	n	Percentage (%)
Abdominal pain	25	83.3
Weight loss	23	76.7
Fever, malaise and anorexia	18	60.0
Constipation	16	53.3
A lump in the abdomen	12	40.0
Vomiting	8	26.7
Diarrhoea alternating with constipation	7	23.3
Diarrhoea	5	16.7
Cough with expectoration	4	13.3

**Multiple symptoms*

Pallor was the most common physical sign, observed in 26 (86.7%) patients. Distended abdomen was present in 19 (63.3%) patients, while abdominal tenderness and palpable abdominal mass were each found in 17 (56.7%) patients. Visible peristalsis was noted in 13 (43.3%) patients. A doughy feeling of the abdomen and ascites were each observed in 3 (10.0%) patients. Cervical lymphadenopathy was present in 2 (6.7%) patients, and obliterated liver dullness was the least common sign, occurring in only 1 (3.3%) patient (*Table III*).

Table III: Distribution of the Study Patients by Major Physical Signs of Intestinal Tuberculosis (*n* = 30*)

Signs	Number (n)	Percentage (%)
Pallor	26	86.7
Distended abdomen	19	63.3
Abdominal tenderness	17	56.7
Palpable abdominal mass	17	56.7
Visible peristalsis	13	43.3
Doughy feeling of the abdomen	3	10.0
Ascites	3	10.0
Cervical lymphadenopathy	2	6.7
Obliterated liver dullness	1	3.3

**Multiple signs*

Table IV shows the site involved in the patients. It was observed that ileocaecal region were 17(56.7%), ileum 6(20.0%), caecum 3(10.0%), colon 3(10.0%) and jejunum 1(3.3%).

Table IV: Distribution of the study patients by site involved (*n*=30)

Site involved	Number (n)	Percentage
Ileocaecal region	17	56.7
Ileum	6	20.0
Caecum	3	10.0
Colon	3	10.0
Jejunum	1	3.3

DISCUSSION

In the present study, it was observed that 40.0% of patients belonged to the age group 21-30 years, and the mean age was 31.1±9.7 years, with a range from 15 to 58 years. Similarly, in Bangladesh, Miah et al found the mean age was 30.01±11.7 years, with a range from 16 to 70 years, which closely resembled the present study [11]. In another study from our country in the last decade, Islam et al found the average age of male and female patients were 27.7 years and 31.1 years, respectively, and the average age of all studied patents were 28.9 years [12]. In this current study, it was observed that males were found in 12 (40.0%) and females were 18(60.0%). Male to female ratio was 1: 1.5. In another study in Bangladesh Islam et al found male 41.6% and female 58.3% giving male to female ratio 1:14. Regarding the symptoms of patients with intestinal tuberculosis it was observed in this study that most (83.3%) of the patients had abdominal pain followed by 76.7% weight loss, 60.0% fever, malaise and anorexia, 53.3% constipation and 40.0% had lump in the abdomen [12]. In Bangladesh, Miah et al. reported that abdominal pain was the most common presenting symptom in 88.68%, fever in 84.9% and weight loss in 69.81% cases and features of intestinal obstruction in 9.43% cases [11]. Similar findings were also observed by Islam et al in the Bangladeshi population [12]. Chalya et al found the commonest presenting symptom was abdominal pain in 93.8% patients [13]. Leung et al. found the most frequent being abdominal pain in 82.0%. Others included diarrhoea, constipation, nausea and vomiting, and rectal bleeding [14]. About half of them had fever, anorexia, and weight loss. Respiratory symptoms were noted in the four patients with concomitant active pulmonary TB. Regarding the symptoms, the above findings are comparable with the current study. Regarding the signs, it was observed in the present study that 86.7% of patients had pallor, followed by 63.3% with a distended abdomen, 56.7% with abdominal tenderness, 56.7%palpable mass in the abdomen and 43.3% had visible peristalsis. In our country Islam et al. found 86.6% patients had pallor, 55.0% had abdominal tenderness, 63.0% had distended abdomen, 53.3% had palpable mass in abdomen, 45.0% had visible peristalsis, 10.0% had doughy feeling of abdomen, 10.0% had ascites, 6.6% had cervical lymphadenopathy and 3.0% had obliterated liver dullness, which is comparable with

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the current study [12]. In this series, it was observed that the ileocaecal region was 56.7%, ileum 20.0%, caecum 10.0%, colon 10.0% and jejunum 3.3%. In another study, the sites involved were ileocaecal region 57.6%, ileum 20%, caecum 11.6%, colon 10% and jejunum 5.7% [12]. In another study, Leung et al. found 86%had ileocaecal involvement; skip lesions along the intestine were described in 14.0%patients two had involvement of the terminal ileum and ascending colon, and one involved the caecum and ascending colon, which are comparable with the current study [14].

LIMITATIONS

The study was conducted with a small sample size, and within a short duration. So, the results may not represent the whole community.

CONCLUSION

The ileocaecal region was the most frequently affected anatomical site, followed by the ileum, while isolated involvement of the caecum, colon, and jejunum was comparatively uncommon. These findings reaffirm the characteristic predilection of intestinal tuberculosis for the ileocaecal region and highlight the importance of maintaining a high index of suspicion in patients presenting with lesions at this site.

RECOMMENDATION

A high index of clinical suspicion should be maintained for intestinal tuberculosis, particularly in patients with ileocaecal lesions presenting with features of intestinal obstruction or chronic abdominal symptoms. Histopathological examination of all resected intestinal specimens should be performed to establish a definitive diagnosis. Further multicenter studies with larger sample sizes are recommended to better define the anatomical distribution and optimise the surgical management of intestinal tuberculosis.

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CONFLICT OF INTEREST

None declared

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