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Original Research Article

Frequency of Intestinal Tuberculosis in Patients with Acute Abdomen

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Abstract: *Intestinal tuberculosis remains an important but often underrecognized cause of acute abdomen in tuberculosis-endemic regions, leading to diagnostic delay and increased morbidity.* ***Objective:*** *To assess the frequency of intestinal tuberculosis among patients presenting with an acute abdomen.* ***Methodology:*** *This study was conducted on 92 patients aged 18 to 65 years who presented with an acute abdomen. These patients were assessed for intestinal TB. Intestinal TB was confirmed through clinical examination, along with a CT scan showing terminal ileum asymmetric wall thickening, cecum, and ileocecal valves associated with necrotic lymph nodes. SPSS 25 was used for data analysis.* ***Results:*** *The mean age of the patients in the present study was 38.86 ± 13.66 years. Fifty-three were (57.6%) male, and 39 (42.4%) were female. The frequency of intestinal tuberculosis was 12 (13.0%). Intestinal TB was notably associated with age > 50 years, malnutrition, low economic background, and pulmonary TB.* ***Conclusion:*** *Intestinal tuberculosis was identified in 13.0% patients presenting with acute abdomen. Intestinal TB showed a significant association with malnutrition, low economic background, and pulmonary TB.*

Keywords: Intestinal tuberculosis, perforation, acute abdomen, histopathology

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Introduction

Acute abdomen remains a potentially life-threatening surgical presentation worldwide, and its differential Diagnosis fluctuates considerably between high and low-income settings. In regions where tuberculosis (TB) remains endemic, intestinal TB is an under-recognized contributor to surgical presentations. Recent studies have emphasized that although pulmonary TB predominates globally, extrapulmonary manifestations persist and may present acutely, particularly among younger adults and in areas with high TB burden. Studies also demonstrated that abdominal TB establishes a substantial share of extrapulmonary cases and complicates acute abdominal disease management. (1, 2) According to a survey, the reported frequency of intestinal TB among acute abdomen cohorts was 16% in settings with higher endemicity, which reflects heterogeneity in case definitions (3).

Several studies reported that intestinal TB accounts for a significant proportion of bowel obstruction cases admitted to emergency units, with a notable proportion of patients necessitating resection. These studies also emphasized demographic patterns and association with malnutrition, which have implications for perioperative risk stratification and follow-up. Diagnostic advances have improved non-operative detection of intestinal TB, but the sensitivity in surgical settings remains imperfect. Reliance on intraoperative findings, coupled with histopathology or mycobacterial culture, frequently persists as the definitive diagnostic pathway in emergency settings. (4-7)

National TB control guidelines in Pakistan recognize abdominal TB as a remarkable extrapulmonary form, endorsing integrated approaches that combine surgical treatment for complications as well as antimicrobial therapy tailored to resistance patterns. There is also limited data from Pakistan and neighboring high-burden regions on the proportion of acute abdomen attributable to intestinal TB, using standardized diagnostic criteria and modern molecular testing. (8-11)

The present study aims to determine the frequency of intestinal TB in patients presenting with an acute abdomen, describe clinical and operative features, and assess diagnostic concordance between preoperative suspicion and intraoperative findings. By providing context-specific data alongside clarifying the diagnostic yield of available investigations, this study intends to guide clinicians in early recognition and management pathways for ITB within acute surgical practice.

Methodology

This cross-sectional study was conducted in the Department of Surgery (Saidu Teaching Hospital, Swat) from 09-May-2024 to 09-November 2024, after taking ethical approval from the hospital. Consecutive non-probability sampling was used. Ninety-two patients, aged 18 to 65 years, presenting with an acute abdomen were enrolled. The sample was calculated using the previous frequency of intestinal TB in acute abdomen 16%,(11) confidence interval 95% and margin of error 7.5%. An acute abdomen was defined by sudden onset of severe abdominal pain (>7 VAS) for less than 24 hours duration, with abdominal tenderness and rigidity. The patients were evaluated for intestinal tuberculosis (TB). It was defined as patients presenting with all of the following symptoms: abdominal pain (VAS >7), weight loss, and fever (38 °C). Diagnosis was made based on a CT scan showing asymmetric wall thickening of the terminal ileum, cecum, and ileocecal valves, with associated necrotic lymph nodes. Patients were excluded if their perforation was due to blunt or penetrating abdominal trauma or if they were pregnant. A consultant surgeon supervised all surgical procedures and the histopathological evaluations.

Data were analyzed with SPSS 25. Age was presented as the mean and standard deviation. Intestinal tuberculosis, clinical presentations such as ileal perforation, intestinal obstruction, and peritonitis, comorbidities such as pulmonary TB, residence, occupation status, socioeconomic status, education status, and malnutrition were presented as frequencies and percentages. Associations were assessed using the chi-square test, with $P < 0.05$ considered significant.

Results

This study included 92 patients, with a mean age of 38.86 ± 13.66 years. Mean BMI was 25.40±1.70 kg/m2. Gender distribution showed that 53 (57.6%) were male and 39 (42.4%) were female patients (Table 1). The most common clinical presentation was intestinal obstruction, observed in 56 (60.9%) cases. Ileal perforation was observed in 26 (28.3%) patients (Table 2).

Table 3 presents the comorbidities in the patients. Intestinal tuberculosis was diagnosed in 12 (13%) cases. Analysis of associated factors showed a statistically significant link of intestinal tuberculosis with age > 50 years (P < 0.001), pulmonary tuberculosis (P < 0.001), malnutrition (P < 0.001), and low socioeconomic status (P = 0.01) (Table 4).

Table 1: Demographic profile

Demographics		**n**	**%**
Gender	Male	53	57.6%
	Female	39	42.4%
Socioeconomic status	Low (< 20K Rs/Month)	29	31.5%
	Middle (20 to 50K Rs/Month)	48	52.2%
	High (> 50K Rs/Month)	15	16.3%
Residence	Rural	58	63.0%
	Urban	34	37.0%
Occupation status	Employed	43	46.7%
	Unemployed	49	53.3%
Educational status	Educated	36	39.1%
	Uneducated	56	60.9%

Table 2: Clinical presentation

Clinical presentation	**n**	**%**
Intestinal obstruction	56	60.9%
Ileal perforation	26	28.3%
Peritonitis	10	10.9%

Table 3: Comorbidities

Comorbidities		**n**	**%**
Pulmonary TB	Yes	19	20.7%
	No	73	79.3%
Malnutrition	Yes	13	14.1%
	No	79	85.9%

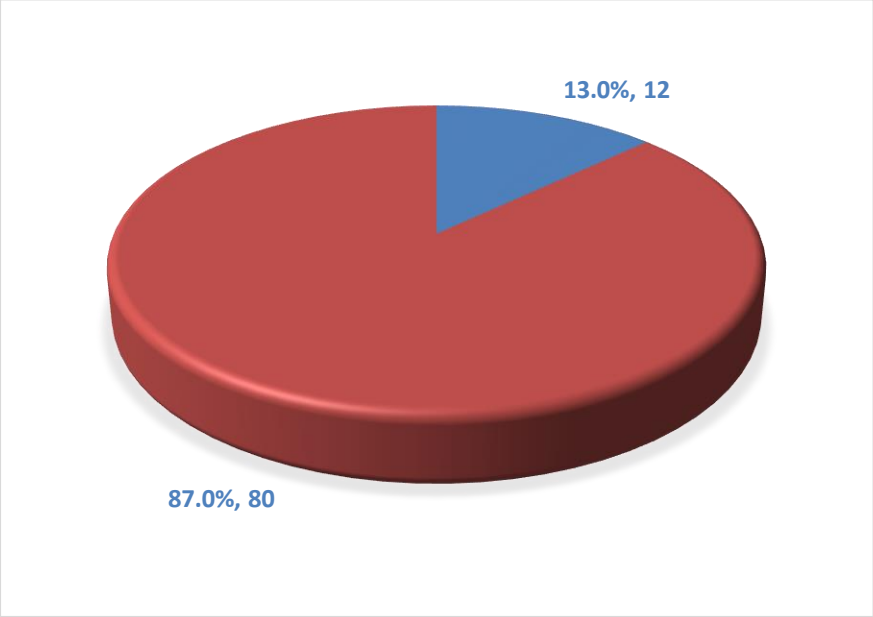

Figure 1: Intestinal tuberculosis

Table 4: Factors associated with intestinal tuberculosis

Factors		Intestinal Tuberculosis				P value
		Yes		No		
		n	%	n	%	
Age distribution (Years)	18 to 35	1	8.3%	38	47.5%	< 0.001
	36 to 50	1	8.3%	27	33.8%	
	> 50	10	83.3%	15	18.8%	
BMI (Kg/m^2)	18.5 to 24.9	5	41.7%	33	41.2%	0.97
	> 24.9	7	58.3%	47	58.8%	
Gender	Male	4	33.3%	49	61.2%	0.06
	Female	8	66.7%	31	38.8%	
Socioeconomic status	Low (< 30K Rs/Month)	8	66.7%	21	26.2%	0.01
	Middle (30 to 80K Rs/Month)	2	16.7%	46	57.5%	
	High (> 80K Rs/Month)	2	16.7%	13	16.2%	
Residence	Rural	9	75.0%	49	61.2%	0.35
	Urban	3	25.0%	31	38.8%	
Pulmonary TB	Yes	9	75.0%	10	12.5%	< 0.001
	No	3	25.0%	70	87.5%	
Malnutrition	Yes	10	83.3%	3	3.8%	< 0.001
	No	2	16.7%	77	96.2%	
Occupation status	Employed	8	66.7%	35	43.8%	0.13
	Unemployed	4	33.3%	45	56.2%	
Educational status	Educated	4	33.3%	32	40.0%	0.65
	Uneducated	8	66.7%	48	60.0%	

Discussion

The findings from this study, centred on the frequency of intestinal tuberculosis in acute abdomen presentations. The demographic profile of the study cohort had a mean age of 38.86 ± 13.66 years and with a majority of male patients, 57.6%, which aligns consistently with several studies. Uddin et al. and Khan et al. similarly identified young to middle-aged adults, particularly those in their third to fourth decades, as the most commonly affected demographic. (3,12) The observed male majority in this study aligns with the work of Uddin et al., who reported 64% male patients in their research. However, it contrasts with other studies, such as the study by Baloch et al. and Mukhopadhyay et al., which documented a female predominance. (13,14)

In this study, the prevalence of intestinal TB was 13.0%. This figure aligns with Uddin et al., who reported 16% and Mukhopadhyay et al., who reported 10% prevalence of intestinal TB. (3,14) A critical finding from this analysis was the association between low socioeconomic status and intestinal tuberculosis. This association underscores a well-established paradigm in the epidemiology of abdominal tuberculosis. Studies by Uddin et al. and Mukhopadhyay et al. similarly reported that the majority of their patients belonged to low socioeconomic backgrounds, characterised by overcrowding, malnutrition, and limited access to healthcare. (3,14) The pathophysiology is that poverty creates an environment that leads to the transmission of Mycobacterium tuberculosis and simultaneously compromises the immunity of the host, which increases susceptibility to infection and its severe, complicated forms.

Intestinal obstruction emerged as the most frequent presentation in 60.9% patients. This finding aligns with Baloch et al., who reported that 72% of their abdominal tuberculosis patients presented with features of obstruction. (13) Similarly, Mukhopadhyay et al. noted intestinal obstruction in 47% of their patients, which was the most common clinical presentation in their study. (14) Ileal perforation was observed in 28.3% cases, which also represents a frequent and serious complication. This complication typically necessitates urgent surgical intervention and is associated with significant morbidity, reinforcing the critical need for timely diagnosis.

This study found an association of intestinal tuberculosis with pulmonary tuberculosis. Similar findings were reported by Uddin et al., who observed that pulmonary tuberculosis was associated with intestinal tuberculosis. (3)

Perhaps the most compelling association was with malnutrition, which was present in 83.3% of patients with intestinal tuberculosis. This aligns with Ullah et al., who identified malnutrition as a significant risk factor for intestinal tuberculosis-related perforation (4). Malnutrition profoundly impairs cell-mediated immunity, which is crucial for containing tuberculous infection. A malnourished host is far more likely to develop progressive, complicated disease forms, such as perforation or widespread dissemination.

This study confirms that intestinal tuberculosis remains a significant and non-negligible cause of surgical emergencies in endemic areas. Its diagnosis continues to be challenging due to non-specific symptoms.

This study is not without limitations. Its cross-sectional design at a single centre limits the generalisability of the findings to other populations. Long-term follow-up data on patient outcomes after surgical and medical management were not captured, which would have been valuable for assessing recovery and complication rates.

Conclusion

In conclusion, the frequency of intestinal tuberculosis among patients with acute abdomen in the current study was 13.0%. It was significantly associated with malnutrition, lower economic background, and pulmonary TB.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned.

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared no conflict of interest.

Author Contribution

FM (PGR)
Manuscript drafting, Study Design, Data Collection, Data entry, Data analysis, and drafting an article.
AUH (Professor)
Conception of Study, Development of Research Methodology Design, Manuscript revisions, and critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the study's integrity.

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