

**ORIGINAL ARTICLE****Exploring tuberculosis-induced intestinal obstruction: A comprehensive study**<sup>1</sup>Devendra Kumar Babbar, <sup>2</sup>Vipin Kumar Sisodia<sup>1</sup>Assistant Professor, Department of General Surgery, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India;<sup>2</sup>Assistant Professor, Department of General Surgery, F H Medical College, Firozabad, Uttar Pradesh, India**ABSTRACT:**

**Background:**-Tuberculosis, designated a global emergency by the World Health Organization (WHO), stands as the most crucial communicable disease worldwide. While it can affect any bodily system, the abdomen ranks among the most frequent sites of infection after the lungs. The focus extends to exploring various management approaches and outcomes related to these cases. **Methods:**Conducted in the upgraded department of general surgery, this retrospective study spans three years and encompasses 20 patients who presented with Intestinal Obstruction due to Tuberculosis. In cases of intestinal obstruction originating from Tuberculosis, the most common presenting complaint among the 20 patients was abdominal pain lasting 3-4 weeks at the time of presentation. **Results:**Out of the 20 patients, 11 underwent surgery. Among these surgically treated patients, the majority exhibited mesenteric thickness, mesenteric lymph node enlargement, and adhesions. Adhesionolysis emerged as the most frequently performed procedure among the operated patients, with stricturoplasty being undertaken in two out of the ten patients with strictures. Additionally, in three patients presenting with an ileo-caecal mass, an ileo-transverse bypass procedure was performed in two cases. Bowel obstruction resulting from intestinal tuberculosis is identified as a prevalent abdominal surgical emergency, significantly contributing to elevated morbidity and mortality rates. Key features of the disease include a younger age at presentation, delayed presentation, and high morbidity and mortality. **Conclusion:**Maintaining a high index of suspicion, conducting thorough evaluations, and implementing therapeutic trials in suspected patients are deemed essential for achieving early diagnosis and timely definitive treatment. These measures are crucial in mitigating the morbidity and mortality associated with this disease.

**Keywords:**-Tuberculosis, Bowel obstruction, Communicable disease.

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**INTRODUCTION**

The urgent call to address tuberculosis, as articulated by the World Health Organization (WHO), underscores the multifaceted challenges that this global emergency presents. With approximately one-third of the world's population affected and an annual death toll of three million, tuberculosis is a formidable adversary, particularly in developing countries where it stands as the leading cause of mortality.<sup>1</sup> At the heart of the issue lie deeply ingrained socioeconomic disparities, with poverty playing a pivotal role in both the transmission and impact of the disease. Poverty not only increases the risk of infection but also creates barriers to accessing essential healthcare and education. This perpetuates a vicious cycle, amplifying the prevalence of tuberculosis and impeding progress towards its containment. The link between limited access to education and higher susceptibility to tuberculosis further highlights the need for a comprehensive approach. Education serves as a powerful tool in raising awareness about preventive measures, yet in regions with lower literacy rates, this crucial aspect is often compromised. Enhancing educational opportunities can empower communities to adopt preventive practices and contribute to breaking the cycle of

transmission. The low rate of disease detection compounds the challenges, allowing tuberculosis to silently proliferate within communities. A shortage of experienced healthcare personnel exacerbates this issue, creating a bottleneck in the timely diagnosis and treatment of affected individuals. The shortage not only hampers the response to existing cases but also poses a barrier to preventing new infections through early intervention. In this complex landscape, inadequate community coverage by immunization programs emerges as another critical factor. Gaps in vaccination efforts leave populations vulnerable, particularly in resource-limited regions where the disease finds fertile ground to persist. Strengthening immunization programs is essential in fortifying the defenses against tuberculosis and reducing its impact on vulnerable communities.<sup>2</sup> To effectively tackle tuberculosis as a global emergency, a holistic approach is imperative. Beyond medical interventions, addressing the root causes of the disease involves targeted efforts to alleviate poverty, enhance education, strengthen healthcare systems, and improve community-based preventive measures. By addressing these underlying factors, the international community can forge a path towards mitigating the impact of tuberculosis, saving lives, and fostering global health

equity. This comprehensive strategy is not just a medical imperative but a moral obligation to create a world where the scourge of tuberculosis is a relic of the past. The resurgence of tuberculosis in developed countries marks a significant shift in public health challenges, and understanding the complex factors behind this trend is crucial for devising effective interventions. One prominent contributor to this resurgence is the influx of immigrants from third-world countries where tuberculosis is more prevalent. The movement of people across borders brings with it the potential for the introduction and spread of infectious diseases, necessitating a comprehensive approach that combines medical, social, and public health measures to address this global challenge.<sup>3</sup> In addition to migration, the rising incidence of HIV infection and the widespread use of immunosuppressive therapy further amplify the difficulties in controlling the spread of tuberculosis. The compromised immune systems of individuals with HIV and those undergoing immunosuppressive treatments create an environment conducive to the reactivation of latent tuberculosis infections, contributing to the increased incidence of the disease in developed nations. Abdominal tuberculosis, despite its potential for cure, poses a unique set of challenges in developed countries. The disease's versatility, affecting various structures within the abdominal region, underscores the need for a nuanced understanding of its manifestations. The gastrointestinal tract, peritoneum, lymph nodes, and solid viscera can all be affected, presenting a complex clinical landscape that demands heightened awareness among healthcare professionals. Different forms of abdominal tuberculosis, such as ulcerative, hypertrophic, ulcer hypertrophic, and fibrous structuring forms, require distinct diagnostic and management approaches. Recognizing these varied presentations is essential for timely intervention and effective control of the disease. Healthcare systems in developed countries need to adapt to this evolving landscape, ensuring that medical professionals are equipped with the knowledge and resources to address abdominal tuberculosis in all its complexity. Public health interventions aimed at curbing the resurgence of tuberculosis in developed countries should be multifaceted.<sup>4,5</sup> This includes targeted public health campaigns to raise awareness, early detection programs to identify cases promptly, and improved access to healthcare for at-risk populations. By addressing the diverse factors contributing to the resurgence of tuberculosis, these interventions can play a pivotal role in mitigating the impact of the disease and advancing control and prevention efforts. The collaborative efforts of healthcare professionals, policymakers, and the community are essential in creating a robust response to this evolving public health challenge. Increased susceptibility to tuberculosis is a significant concern, with certain demographic groups, such as

infants, children, and senior adults, facing heightened risks. The causative agent, *Mycobacterium tuberculosis*, primarily targets the respiratory system, spreading through activities like coughing, sneezing, and even regular conversations with infected individuals, thereby increasing the likelihood of transmission. A weakened immune system, a pivotal factor in susceptibility, places individuals at higher risk.<sup>6</sup> Those with compromised immune systems, such as individuals with HIV/AIDS or those on immunosuppressive medications, face a heightened vulnerability. In these cases, the diminished immune response allows *Mycobacterium tuberculosis* to progress from a latent to an active state, leading to the development of tuberculosis. Age-related factors also contribute to susceptibility, as both infants and senior adults face unique challenges. Infants and children, with developing immune systems, are more susceptible to infections, including tuberculosis. Conversely, senior adults may experience a decline in immune function with age, making them more vulnerable to infectious diseases. The mode of transmission plays a crucial role in the spread of tuberculosis. Close living or working quarters elevate the risk of exposure, especially in environments where respiratory droplets can easily be transmitted. Countries with a higher prevalence of tuberculosis, coupled with a significant homeless population, face an increased risk due to the challenges in accessing healthcare and the potential for heightened exposure. Addressing these risk factors requires a comprehensive approach. Immunization programs, early detection, and treatment are essential components of efforts to combat tuberculosis. Public health initiatives aimed at improving living conditions, healthcare accessibility, and raising awareness play a pivotal role in reducing the overall burden of the disease. By understanding and addressing the factors contributing to increased susceptibility and transmission, interventions can be tailored to mitigate the impact of tuberculosis on vulnerable populations, ultimately working towards a reduction in the global burden of the disease.

## MATERIAL AND METHODS

The study prioritized a diverse representation of age groups among participants, striving to encompass a broad demographic spectrum to enhance the generalizability of findings.

**Inclusion Criteria:** Participants were included based on the confirmation of tuberculosis, established through histopathological positivity of the specimen, ensuring a robust and specific criterion for study enrolment.

**Exclusion Criteria:** Cases involving tuberculosis peritonitis or perforation due to tuberculosis were intentionally excluded to maintain a focused

investigation on intestinal obstruction, ensuring clarity in the study's objectives.

This retrospective study concentrated on 20 patients presenting to the acute surgical care unit of the upgraded General Surgery department, specifically with intestinal obstruction attributed to tuberculosis. Spanning a three-year period, the study aimed to provide a comprehensive analysis of cases during this timeframe. All enrolled patients underwent an extensive set of preliminary investigations, including hemogram, chest X-ray (PA view), erect abdominal X-ray, abdominal ultrasonogram, sputum examination for acid-fast bacilli (AFB), and a Mantoux test. These investigations aimed to establish a baseline understanding of patients' health status and aid in the accurate diagnosis of tuberculosis. The research meticulously analyzed various clinical presentations exhibited by participants, with a specific focus on understanding the diverse ways in which tuberculosis-related intestinal obstruction manifested, contributing to a nuanced understanding of the disease. Patients were categorized based on their mode of presentation into two groups: acute intestinal obstruction and sub-acute intestinal obstruction. This categorization facilitated a targeted approach to managing the different clinical scenarios associated with tuberculosis-related intestinal obstruction.

**Colonoscopy:** Patients planned for conservative management underwent colonoscopy, a valuable diagnostic and therapeutic procedure providing additional insights into the condition and guiding the management strategy for these individuals.

**Postoperative Treatment:** Following operative procedures, all patients received postoperative anti-tuberculosis therapy (ATT), reflecting a comprehensive approach addressing both immediate surgical concerns and the underlying tuberculosis infection. This holistic treatment plan aimed to optimize outcomes for patients.

By integrating retrospective analysis, detailed preliminary investigations, categorization based on

clinical presentations, and a multidisciplinary approach to postoperative care, the study sought to contribute valuable insights into the management of intestinal obstruction in the context of tuberculosis. It offered a nuanced perspective on the clinical complexities associated with this condition, providing a foundation for improved patient care and potential advancements in treatment strategies.

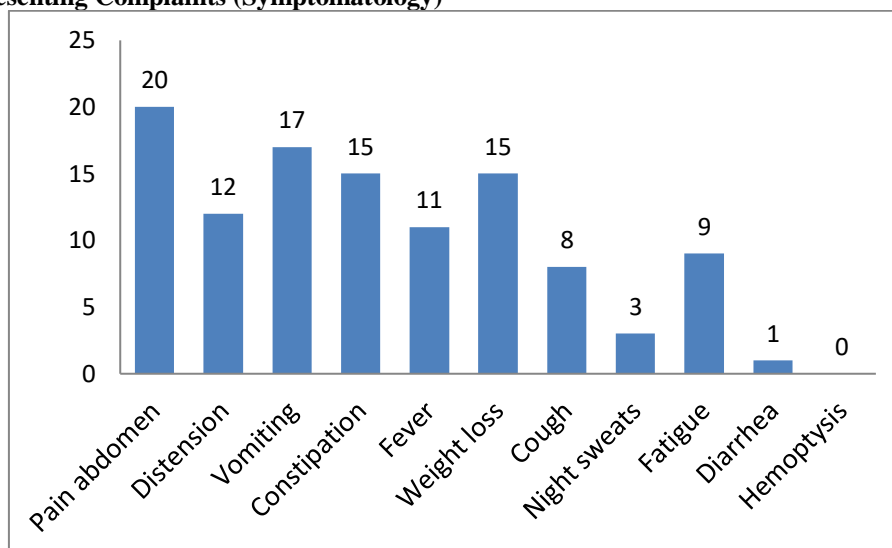
## RESULTS

The retrospective study spanned a 3-year duration within the surgical department, with a specific focus on patients experiencing intestinal obstruction. Among the 147 patients presenting with intestinal obstruction during this period, tuberculosis emerged as the identified cause in 20 cases. The study group consisted of 11 male and 9 female participants, revealing a slightly higher incidence in the age group of 22-34 years. Among the 20 patients under investigation, 12 presented with acute intestinal obstruction, while 8 exhibited sub-acute intestinal obstruction. The most frequently reported complaints at the time of presentation included pain in the abdomen, vomiting, constipation, and abdominal distension. Additionally, constitutional symptoms were noted among the study participants. This retrospective analysis offers valuable insights into the prevalence and characteristics of tuberculosis-related intestinal obstruction within the specified population over the examined three-year period. The demographic distribution, predominant symptoms, and categorization of cases based on the nature of intestinal obstruction contribute to a more nuanced understanding of the clinical landscape. Such insights can inform future research, enhance diagnostic strategies, and guide tailored interventions for individuals presenting with intestinal obstruction linked to tuberculosis. The study's findings contribute to the on-going efforts to refine the management and care protocols for this specific subset of patients, shedding light on the unique challenges associated with tuberculosis-related intestinal obstruction in the examined population.

**Table 1: Presenting Complaints (Symptomatology)**

|    | Complaint    | No. of Patients | Percentage |
|----|--------------|-----------------|------------|
| 1  | Pain abdomen | 20              | 100%       |
| 2  | Distension   | 12              | 68.2 %     |
| 3  | Vomiting     | 17              | 90.2 %     |
| 4  | Constipation | 15              | 78.0 %     |
| 5  | Fever        | 11              | 58.53 %    |
| 6  | Weight loss  | 15              | 80.48 %    |
| 7  | Cough        | 8               | 39.02 %    |
| 8  | Night sweats | 3               | 14.6%      |
| 9  | Fatigue      | 9               | 46.34%     |
| 10 | Diarrhea     | 1               | 7.31 %     |
| 11 | Hemoptysis   | 0               | 0%         |

**Figure 1: Presenting Complaints (Symptomatology)**



In the group of 20 patients, right iliac fossa tenderness was observed in 4 individuals, while 7 patients exhibited generalized tenderness. Tenderness was notably absent in 5 patients. A significant proportion of the patients in this study experienced symptoms for a duration of 3-4 weeks at the time of presentation. The delayed presentation observed in this study can be attributed to the inherent challenges in diagnosing intestinal TB in its initial stages. The condition often manifests with vague and non-specific symptoms, leading to a delayed diagnosis. Consequently, patients may remain undiagnosed for prolonged periods, receiving symptomatic treatment, and subsequently presenting late with complications such as acute or sub-acute intestinal obstruction. Among the 20 patients, 5 were already known cases of tuberculosis and were on anti-tuberculosis therapy (ATT). This highlights the complexity of managing patients with a

history of tuberculosis, suggesting that even with prior awareness of the condition, challenges in timely intervention and prevention of complications persist.

**X-Ray Findings:** In the current study, 5 patients (29.22%) had a documented history of tuberculosis and had been treated with anti-tuberculosis therapy (ATT). Within the group of 20 patients, 7 individuals exhibited lesions in the chest X-ray, encompassing all 5 patients with a prior history of tuberculosis. The remaining 2 patients presented with pleural effusion and consolidation. Analysis of erect abdomen X-rays revealed air-fluid levels in 16 patients (80.5%), indicating a prevalent finding, while 3 patients (17.07%) displayed dilated bowel loops. These radiographic observations contribute valuable information regarding the diagnostic features and manifestations of intestinal tuberculosis in the studied patient cohort.

**Table 2: X-RAY Findings**

| CHEST X-RAY   |            | ERECT ABDOMEN      |            |
|---------------|------------|--------------------|------------|
| Changes       | No. of Pt. | Changes            | No. of Pt. |
| Consolidation | 2          | Air fluid levels   | 16         |
| Infiltrates   | 2          | Dilated bowel loop |            |
| Cavity        | 3          | Normal             | 1          |
| Effusion      | 2          |                    |            |
| Normal        | 12         |                    |            |

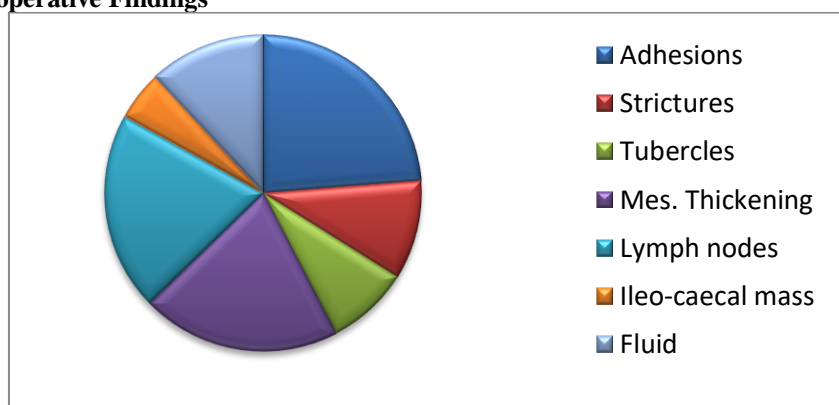
In the current study, among the 20 patients, 11 individuals (58.5%) underwent surgery within 24 hours of admission. The remaining 9 patients initially received conservative management; however, 3 of them (17.1%) ultimately required elective surgery due to persistent symptoms. On the other hand, 4 patients (24.39%) experienced relief with conservative management. Among the 14 patients who underwent surgery in this study, the majority exhibited mesenteric thickening and mesenteric lymph nodal enlargement (80.64%), along with adhesions

(70.96%). It is noteworthy that many patients displayed more than one of these findings. The likelihood of encountering adhesions was notably higher in patients presenting with acute intestinal obstruction compared to those presenting with sub-acute intestinal obstruction. These findings underscore the varied management approaches and outcomes observed in the studied patient cohort, shedding light on the prevalence of specific surgical indicators in cases of intestinal tuberculosis.

**Table 3: Intraoperative Findings**

| S.No | Findings         | Patients | Percentage |
|------|------------------|----------|------------|
| 1    | Adhesions        | 14       | 70.96 %    |
| 2    | Strictures       | 6        | 32.25 %    |
| 3    | Tubercles        | 5        | 29.03 %    |
| 4    | Mes. Thickening  | 12       | 80.64 %    |
| 5    | Lymph nodes      | 12       | 80.64 %    |
| 6    | Ileo-caecal mass | 3        | 19.34%     |
| 7    | Fluid            | 7        | 48.38 %    |

**Figure2: Intraoperative Findings**



**Adhesions and Operative Procedures:** In the current study, among the 11 patients with adhesions, various associations were observed, and only 1 patient had adhesions exclusively. Among the remaining 8 patients without adhesions, 2 were managed conservatively. In the remaining 4 patients, 3 had strictures, all located in the ileum, and 1 patient presented with an ileo-caecal mass. **Operative Procedures:** Among the 14 patients who underwent surgery in this study, adhesionolysis emerged as the most commonly performed procedure. Additionally, among the 10 patients with strictures, 2 underwent stricturoplasty. For the 3 patients with an ileo-caecal mass, an ileo-transverse bypass procedure was performed in 2 of them. These operative interventions underscore the diverse surgical approaches required for managing the complexities associated with intestinal tuberculosis in the studied patient cohort.

**DISCUSSION**

The present study unveils tuberculosis as a substantial contributor to bowel obstruction, pinpointing it as the primary cause in 14% of patients within the investigated cohort. **Age Incidence:-** Intestinal tuberculosis, echoing its impact on various bodily systems, significantly affects individuals in the prime of their productive lives.<sup>7</sup> The study illuminates a consistent trend, with the highest incidence observed in the 2nd and 3rd decades of life. Strikingly, more than 75% of the patients were below the age of 40, underscoring the profound implications for the national economy. The burden of tuberculosis intestinal obstruction on the working and productive segment of the community highlights the potential transformation from a healthy and active workforce to

individuals grappling with illness and incapacity. **Sex Incidence:-** The study's findings disclose a slightly higher prevalence of tuberculosis-induced bowel obstruction in males compared to females, with a male-to-female ratio of 1.15:1. This gender-based variation offers valuable epidemiological insights, prompting further exploration into potential contributing factors that may influence disease incidence among different demographic groups. **Symptomatology:-** The clinical presentation of tuberculosis-induced intestinal obstruction in the study cohort primarily revolves around abdominal pain, a symptom universally experienced by all individuals.<sup>8</sup> The non-specific nature of clinical manifestations in abdominal tuberculosis often leads to diagnostic delays, contributing to the development of complications such as intestinal obstruction. The study underscores the critical importance of early recognition and intervention to mitigate the impact of tuberculosis on patients, preventing the progression to more severe complications. The findings emphasize the need for heightened awareness among healthcare professionals regarding the diverse presentations of tuberculosis, facilitating prompt diagnosis and intervention to improve patient outcomes. This insight is vital for enhancing clinical vigilance and ensuring a proactive approach in managing patients with tuberculosis-induced intestinal obstruction. Furthermore, the age incidence revealed by the study not only underscores the impact on the most economically active segments of the population but also suggests a potential long-term societal burden. The prevalence of intestinal tuberculosis in individuals below the age of 40 raises concerns about the potential disruptions to family dynamics,

educational pursuits, and overall community well-being. In examining sex incidence, the slightly higher prevalence in males prompts intriguing questions about gender-specific risk factors or variations in healthcare-seeking behaviors. Unraveling these aspects could offer insights into tailored preventive strategies and early detection efforts, contributing to more effective public health initiatives.<sup>9</sup> The dominance of abdominal pain as a key clinical presentation highlights the need for improved awareness not only among healthcare professionals but also within communities. Educating individuals about the diverse symptoms of tuberculosis-induced intestinal obstruction may empower them to seek medical attention sooner, potentially reducing the severity of complications and improving overall prognosis. Moreover, the findings prompt considerations for targeted screening and awareness campaigns, especially within high-risk demographics identified by the study. Tailoring public health initiatives to address the unique age and gender dynamics can enhance their impact, fostering a more proactive approach towards the prevention, early detection, and management of tuberculosis-induced bowel obstruction. This holistic understanding of the disease's demographic nuances is crucial for crafting effective strategies that go beyond medical interventions to address the broader societal implications of intestinal tuberculosis. In our study, a notable observation was the identification of associated pulmonary tuberculosis in 29.2% of cases, establishing a significant link between pulmonary and intestinal manifestations of tuberculosis. This finding emphasizes the systemic nature of the disease, highlighting the importance of comprehensive screening and evaluation for individuals presenting with intestinal symptoms.

Adhesions and bands emerged as predominant findings in our investigation, shedding light on the adhesive nature of tuberculosis-related pathology in the intestinal region. The prevalence of these fibrous connections underscores their potential contribution to complications such as bowel obstruction, thereby influencing the overall clinical trajectory of the disease.<sup>10</sup> The recognition of these structural alterations offers valuable insights for clinicians, emphasizing the need for a nuanced surgical approach in managing complications arising from tuberculosis-related adhesions and bands. Regarding the site of pathology, our study unveiled the terminal ileum as the most commonly affected, closely followed by the ileo-caecal region. This specific distribution pattern may be attributed to a complex interplay of factors, including increased physiological stasis, heightened rates of fluid and electrolyte absorption, minimal digestive activity, and the presence of abundant lymphoid tissue. The intricate dynamics in this region likely create an environment conducive to the development of tuberculosis-related pathology. Furthermore, the observed decline in the frequency of

bowel involvement moving both proximally and distally from the ileocaecal region suggests a distinct pattern of distribution along the intestinal tract, warranting further exploration into the underlying mechanisms governing this phenomenon. These findings provide valuable insights into the specific characteristics and distribution of tuberculosis-related pathology in the intestinal region. Understanding the predilection for certain sites and the prevalence of associated pulmonary tuberculosis contributes to a more comprehensive understanding of the disease's pathophysiology. Such insights are instrumental in developing targeted management strategies and interventions tailored to the unique aspects of intestinal tuberculosis, ultimately enhancing the care and outcomes for individuals affected by this complex condition. The implications of these findings extend beyond the immediate clinical context, influencing the broader landscape of tuberculosis research and treatment.<sup>11</sup>

Moreover, the identification of associated pulmonary tuberculosis in nearly one-third of cases underscores the intricate relationship between respiratory and gastrointestinal manifestations of tuberculosis. This correlation highlights the need for a holistic approach to patient care, emphasizing the importance of thorough clinical assessments and integrated management strategies that address both pulmonary and intestinal aspects of the disease. The prominence of adhesions and bands as predominant findings in our study raises intriguing questions about the specific mechanisms underlying the fibrotic changes induced by tuberculosis. Exploring the molecular and cellular pathways involved in the formation of these adhesions could provide valuable insights into the pathogenesis of intestinal tuberculosis. Such knowledge might open avenues for targeted therapeutic interventions aimed at preventing or mitigating the development of fibrous adhesions and reducing the likelihood of complications such as bowel obstruction.<sup>12</sup> The distinct distribution pattern of pathology along the intestinal tract, with the terminal ileum being the most commonly affected site, prompts further investigation into the localized factors contributing to tuberculosis-related pathology. Understanding the specific microenvironment and immunological factors in this region may offer clues to the disease's predilection for the terminal ileum and the ileo-caecal region. This knowledge can guide future research endeavours focused on unravelling the complex interactions between the bacterium and the host's intestinal physiology. In the broader context of public health, the insights gained from this study contribute to the foundation for targeted preventive measures and early diagnostic strategies for intestinal tuberculosis. Recognizing the characteristic sites of involvement and the potential for associated pulmonary tuberculosis informs healthcare professionals about the nuanced nature of the disease, facilitating more timely and accurate interventions. In conclusion, our

study not only provides valuable clinical insights into the specific features of intestinal tuberculosis but also sparks avenues for further research into the underlying mechanisms and potential therapeutic targets. By unravelling the intricacies of tuberculosis-related pathology, we move closer to refining treatment approaches, enhancing patient outcomes, and advancing our collective understanding of this complex infectious disease.

## CONCLUSION

Bowel obstruction arising from intestinal tuberculosis emerges as a prevalent and significant abdominal surgical emergency, contributing substantially to increased morbidity and mortality rates. Several key features define this disease, setting it apart in the realm of abdominal emergencies. Notably, there is a tendency for intestinal tuberculosis to manifest at a young age, emphasizing its impact on a demographic typically considered less susceptible to severe abdominal conditions. Furthermore, the disease often exhibits a propensity for delayed presentation, adding a layer of complexity to its diagnosis and management. The combination of these factors forms the hallmark characteristics of intestinal tuberculosis, creating a distinct clinical profile. Given the challenges associated with this condition, maintaining a high index of suspicion becomes imperative for healthcare practitioners. Recognizing the unique features of intestinal tuberculosis, such as its predilection for a younger age group and the potential for delayed presentation, is crucial for prompt and accurate diagnosis. Early suspicion allows for timely evaluation, and initiating a therapeutic trial in individuals suspected of having the disease becomes a pivotal step in the diagnostic process. Timely definitive treatment is paramount in mitigating the associated morbidity and mortality rates linked to intestinal tuberculosis. The urgency of intervention underscores the importance of swift and accurate management strategies. Healthcare professionals play a critical role in navigating the complexities of this abdominal surgical emergency, emphasizing the need

for a proactive approach to achieve early diagnosis and implement timely interventions. By doing so, the medical community can significantly impact the outcomes of individuals affected by intestinal tuberculosis, reducing the burden of morbidity and mortality associated with this challenging condition.

## REFERENCES

1. World Health Organization Bulletin in Epidemiology of Tuberculosis, 2002.
2. Suri S, Gupta S. CT scan in Abdominal Tuberculosis. *Br J Radiol* 1999; 72: 92-98.
3. Sharp JF, Goldman M. Abdominal Tuberculosis in East Birmingham, a 16 years study, *Postgrad Med J* 2002; 63: 539-42.
4. Khan MR, Khan IR, Pal KNM. Diagnostic issues in Abdominal Tuberculosis, *J Pak Med Assoc* 2001; 51(4): 138-140.
5. Engin G, Balk E. Imaging findings of Intestinal Tuberculosis. *J Comput Assist Tomogr* 2005 Jan- Feb; 29(1): 37-41.
6. Rita S. Diagnosis of Abdominal Tuberculosis. Role of imaging. *J Ind Acad Clin Med* 2001; 2(3): 103-04.
7. Anuradha B, Apama S, Hari S P V, Vijaya L V, Akbar Y, Suman L G, Murthy K J. Prevalence of drug resistance under the DOTS strategy in Hyderabad, South India, 2001-2003, *Int J Tuberc Lung Dis* 2006; 10(1): 58-62.
8. Kapoor VK Abdominal TB *Postgrad Med J* 1998; 74: 459-67.
10. Ahmed M, Maingal M A. Pattern of mechanical intestinal obstruction in adults. *J Coll Physicians Surg Pak* 1999; 9: 441-3.
9. Gondal K M, Khan A F A. Changing Pattern of abdominal tuberculosis *Pak J Surg* 1995; 11: 109-13.
10. Society/Centers for Disease Control and Prevention/Infectious Diseases Society of America: Treatment of tuberculosis. *Am J Respir Crit Care Med* 167:604-662, 2003. –
11. K. Park: Park's Text book of Preventive and Social Medicine; Bhanot publication; edition-21; chapter 5.1, page 164.
12. Tuberculous bowel obstruction: Phillip L Chalya, Mabula D Mchembe, Stephen E Mshana, Peter Rambau, Hyasinta Jaka, Joseph B Mabula: world journal of emergency surgery. 2013; 8: 12.