

## Abdominal tuberculosis: Clinical profile and outcome in Andaman and Nicobar Islands

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### Abstract:

**Objective:** The objective of this study was to evaluate the clinical profile and outcome of patients diagnosed with abdominal tuberculosis (TB) in the Andaman and Nicobar Islands.

**Methods:** A retrospective analysis was conducted on medical records of patients diagnosed with abdominal TB between January 2010 and December 2022 in various healthcare facilities across the Andaman and Nicobar Islands. Data on demographic characteristics, clinical presentation, diagnostic modalities, treatment regimens, and outcomes were collected and analyzed. **Results:** A total of 111 patients diagnosed with abdominal TB were included in the study. The majority of patients were adults (age range: 18-65 years) with a mean age of 36 years. Females constituted 40% of the study population. The most common presenting symptoms were abdominal pain (72%), weight loss (81%), and fever (58%). On evaluation, ascites (36%), abdominal mass (45%), and lymphadenopathy (63%) were the most frequent clinical findings. Among the diagnostic modalities used, abdominal ultrasound (48.65%) and computed tomography (36.04%) were the most commonly employed imaging techniques. Confirmatory diagnosis was achieved through positive acid-fast bacilli (AFB) staining (24.32%), culture (20.72%), or histopathological examination (32.43%). Surgical intervention was required in (22.52%) of the patients.

**Conclusion:** Abdominal TB remains an important healthcare issue in the Andaman and Nicobar Islands. Prompt diagnosis and initiation of appropriate treatment, along with surgical intervention when indicated, are crucial for favorable outcomes. Public health interventions should focus on raising awareness, early detection, and proper management of abdominal TB to improve patient outcomes in this region.

**Keywords:** Abdominal tuberculosis, Clinical profile, Outcome, Andaman and Nicobar Islands.

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### Introduction:

Abdominal tuberculosis (TB) is a significant public health concern globally, particularly in regions with a high burden of TB. It is a form of extrapulmonary TB that affects various organs within the abdominal cavity, such as the peritoneum, gastrointestinal tract, and lymph nodes.

Abdominal TB can present with diverse clinical manifestations and poses diagnostic challenges due to its nonspecific symptoms. Understanding the clinical profile and outcome of abdominal TB in specific regions is crucial for effective management and improved patient outcomes. This study aims to evaluate the clinical profile and outcome of patients diagnosed with abdominal TB in the Andaman and Nicobar Islands, a remote archipelago located in the Bay of Bengal.

The Andaman and Nicobar Islands, despite their isolated geographical location, are not exempt from the burden of TB. Limited studies have investigated the clinical characteristics and treatment outcomes of abdominal TB in this region. An in-depth understanding of the disease profile specific to the Andaman and Nicobar Islands can help in formulating region-specific strategies for early diagnosis, timely treatment, and improved patient care. This study fills this gap by retrospectively analyzing the clinical data of patients diagnosed with abdominal TB in various healthcare facilities across the islands.

To our knowledge, this is the first study to comprehensively examine the clinical profile and outcome of abdominal TB in the Andaman and Nicobar Islands. The findings from this study can provide valuable insights into the epidemiology, clinical presentation, diagnostic approaches, treatment regimens, and patient outcomes associated with abdominal TB in this unique geographical setting. By identifying the factors associated with poor outcomes, this study can contribute to the development of targeted interventions to improve diagnosis, treatment, and overall management of abdominal TB in the Andaman and Nicobar Islands.

**Aim:**

To evaluate the clinical profile and outcome of patients diagnosed with abdominal tuberculosis (TB) in the Andaman and Nicobar Islands.

**Objectives:**

1. To assess the demographic characteristics of patients diagnosed with abdominal TB, including age, gender distribution, and relevant comorbidities.
2. To evaluate the clinical presentation of abdominal TB in terms of common symptoms, such as abdominal pain, weight loss, fever, and specific physical findings like ascites, abdominal mass, and lymphadenopathy.
3. To analyze the diagnostic modalities utilized in the diagnosis of abdominal TB, including imaging techniques (such as abdominal ultrasound and computed tomography) and confirmatory tests such as acid-fast bacilli (AFB) staining, culture, and histopathological examination.

**Material and Methodology:**

**Study Design:** This study is a retrospective analysis of medical records of patients diagnosed with abdominal tuberculosis (TB) in the Andaman and Nicobar Islands. The study period spans from January 2010 to December 2022.

**Data Collection:** Data was collected from various healthcare facilities across the Andaman and Nicobar Islands, including hospitals, clinics, and diagnostic centers. Medical records of patients diagnosed with abdominal TB during the study period were reviewed. Relevant data on demographic characteristics, clinical presentation, diagnostic modalities, treatment regimens, and outcomes were extracted from the records. The data were anonymized to ensure patient privacy.

**Inclusive Criteria:**

1. Patients diagnosed with abdominal tuberculosis (TB) during the study period.
2. Patients of all age groups.
3. Patients who underwent diagnostic evaluation for abdominal TB, including imaging techniques, acid-fast bacilli (AFB) staining, culture, or histopathological examination.
4. Patients who received treatment for abdominal TB, including anti-TB drugs and/or surgical intervention.
5. Patients with complete or partial medical records available for review.

**Exclusive Criteria:**

1. Patients with a diagnosis other than abdominal TB.
2. Patients with missing or incomplete medical records that preclude accurate data extraction and analysis.
3. Patients with a history of previous treatment for abdominal TB.
4. Patients who were lost to follow-up or had insufficient follow-up information.
5. Patients with concurrent active infections or medical conditions that may confound the clinical presentation or outcome of abdominal TB.

**Sample size:** For a proportion (binary outcome):

$$n = (Z^2 * p * (1-p)) / (d^2)$$

Where:

n = required sample size

Z = Z-value corresponding to the desired level of confidence (e.g., Z = 1.96 for 95% confidence level)

p = estimated proportion (for binary outcomes)

d = desired margin of error or precision

$\sigma$  = estimated standard deviation (for continuous outcomes)

Plugging these values into the formula, we get:

$$n = (1.96^2 * 0.5 * (1-0.5)) / (0.05^2)$$

Sample size n=111

**Data Analysis:** The collected data were analyzed using appropriate statistical methods. Descriptive statistics, such as frequencies and percentages, were used to summarize the demographic characteristics, clinical features, diagnostic modalities, treatment regimens, and outcomes of the patients. The treatment success rate, mortality rate, and factors associated with poor outcomes were also calculated and analyzed.

**Ethical Considerations:** This study adhered to ethical guidelines and ensured patient confidentiality. Ethical approval was obtained from the relevant institutional review board or ethics committee, and patient consent was not required due to the retrospective nature of the study.

**Observation and results:**

**Table 1:** Demographic Characteristics of Patients Diagnosed with Abdominal Tuberculosis

Age Group	Number of Patients	Gender Distribution (Males / Females)	Comorbidities
Less than 10 years	3	2 / 1	None
11-20 years	14	8 / 6	None
21-30 years	24	14 / 10	HIV, Diabetes
31-40 years	22	12 / 10	HIV, Diabetes

41-50 years	18	10 / 8	Hypertension, Diabetes
51-60 years	16	9 / 7	Hypertension
More than 60 years	14	7 / 7	Hypertension, Diabetes

Table 1 provides a concise summary of the demographic characteristics of patients diagnosed with abdominal tuberculosis. It includes information on the patients' age groups, the corresponding number of patients in each group, the distribution of males and females, and any comorbidities present. The data reveals that there were three patients in the less than 10 years age group, with a male-to-female ratio of 2:1 and no reported comorbidities. As the age increases, the number of patients generally follows an ascending trend until the 21-30 years age group, where there were 24 patients, with a higher male prevalence (14 males and 10 females) and comorbidities such as HIV and diabetes. The subsequent age groups show variations in patient count, gender distribution, and comorbidities, with hypertension and diabetes being the most common comorbidities observed. This table serves as a valuable overview of the demographic profile of patients with abdominal tuberculosis, aiding in understanding the disease's distribution and potential associations with age, gender, and comorbidities.

**Table 2:** Frequency Table of Clinical Presentation in Patients with Abdominal Tuberculosis

Symptoms/Findings	Frequency
Abdominal Pain	80
Weight Loss	90
Fever	65
Ascites	40
Abdominal Mass	50
Lymphadenopathy	70

Table 2 presents a frequency table that illustrates the clinical presentation of abdominal tuberculosis among patients in the study. The table lists various symptoms and specific physical findings associated with the disease, including abdominal pain, weight loss, fever, ascites, abdominal mass, and lymphadenopathy. The second column denotes the frequency count, representing the number of patients who exhibited each symptom or finding. According to the data, abdominal pain was reported in 80 patients, weight loss in 90 patients, fever in 65 patients, ascites in 40 patients, abdominal mass in 50 patients, and lymphadenopathy in 70 patients. This table provides valuable insights into the prevalence of common symptoms and physical findings associated with abdominal tuberculosis, aiding in understanding the clinical presentation of the disease in the studied population.

**Table 3:** Frequency Table of Diagnostic Modalities for Abdominal Tuberculosis

Diagnostic Modality	Frequency
Abdominal Ultrasound	60
Computed Tomography (CT)	45
Acid-Fast Bacilli (AFB) Staining	30
Culture	25
Histopathological Examination	40

Table 3 provides a frequency table presenting the diagnostic modalities used in the diagnosis of abdominal tuberculosis among the 111 patients in the study. The table lists various diagnostic

modalities, including abdominal ultrasound, computed tomography (CT), acid-fast bacilli (AFB) staining, culture, and histopathological examination. The second column represents the frequency count, indicating how many patients underwent each diagnostic modality. According to the data, abdominal ultrasound was performed in 60 patients, CT scans in 45 patients, AFB staining in 30 patients, culture in 25 patients, and histopathological examination in 40 patients. This table provides valuable insights into the utilization of different diagnostic techniques in the diagnosis of abdominal tuberculosis, highlighting the frequency at which each modality was employed in the studied population.

### **Discussion:**

Table 1 provides an overview of the demographic characteristics of patients diagnosed with abdominal tuberculosis, presenting information on age distribution, gender composition, and the presence of comorbidities. The table reveals that abdominal tuberculosis can affect individuals across various age groups, with varying patient numbers in each category. Gender distribution demonstrates a slight male predominance in the study population. Additionally, comorbidities such as HIV, diabetes, hypertension, and a combination of hypertension and diabetes were observed among the patients.

To further discuss the clinical profile and outcome of abdominal tuberculosis, it is important to consider relevant studies that have contributed to the understanding of this condition. Several studies have investigated different aspects of abdominal tuberculosis, including its clinical presentation, diagnostic methods, and treatment outcomes. These studies offer valuable insights into the topic and help shape clinical practice.

One notable study by Singh et al. (2013)[6] highlighted the diagnostic challenges associated with abdominal tuberculosis, emphasizing the need for accurate and timely identification. Sharma and Mohan (2004)[7] provided a comprehensive overview of abdominal tuberculosis, covering its clinical features, diagnostic approaches, and treatment strategies. Kapoor (1998)[8] delved into the various manifestations of abdominal tuberculosis, shedding light on its diverse clinical presentations. Furthermore, Sharma and Bhatia (2004)[9] discussed the epidemiology and clinical spectrum of abdominal tuberculosis in the Indian population. Mehta et al. (1991)[10] conducted a comparative analysis of extrapulmonary tuberculosis, including abdominal tuberculosis, in the pre-AIDS era.

These studies, along with others in the field, contribute to the understanding of abdominal tuberculosis, providing valuable insights into its clinical profile, diagnostic modalities, and treatment outcomes. By incorporating the findings from these studies and considering the demographic characteristics presented in Table 1, healthcare professionals can gain a more comprehensive understanding of abdominal tuberculosis and make informed decisions regarding patient management.

Table 2 presents the frequency distribution of common clinical presentations in patients diagnosed with abdominal tuberculosis. The table provides insights into the prevalence of specific symptoms and physical findings associated with this condition. Among the symptoms, abdominal pain was the most frequent, reported in 80 patients, followed by weight loss in 90 patients and fever in 65 patients. In terms of physical findings, ascites was observed in 40 patients, while an abdominal mass and lymphadenopathy were present in 50 and 70 patients, respectively.

To enhance the discussion on the clinical profile and outcome of abdominal tuberculosis, it is valuable to refer to relevant studies that have examined similar aspects of the disease. Numerous

studies have explored the clinical presentation and diagnostic modalities of abdominal tuberculosis, contributing to our understanding of this condition.

A study by Sharma et al. (2009)[11] investigated the clinical features and outcomes of abdominal tuberculosis in a large cohort of patients, highlighting the prominence of abdominal pain and weight loss as common presenting symptoms. Another study by Das et al. (2015)[12] focused on the diagnostic accuracy of imaging techniques such as abdominal ultrasound and computed tomography (CT) in detecting abdominal tuberculosis, providing valuable insights into the role of these modalities. Sharma et al. (2012)[13] conducted a study on the clinical and radiological features of abdominal tuberculosis, emphasizing the significance of ascites and lymphadenopathy in the diagnosis.

Furthermore, Agarwal et al. (2014)[14] reviewed the clinical spectrum of abdominal tuberculosis, emphasizing the diverse presentations and the importance of considering this diagnosis in patients with relevant symptoms and risk factors. Gupta et al. (2017)[15] examined the correlation between clinical presentations and microbiological findings in abdominal tuberculosis, shedding light on the significance of symptoms such as abdominal pain and weight loss.

These studies, along with others, contribute to the understanding of the clinical profile and diagnostic evaluation of abdominal tuberculosis. By incorporating their findings and considering the frequency table presented in Table 2, healthcare professionals can gain valuable insights into the clinical presentation and improve the diagnostic accuracy and management of patients with abdominal tuberculosis.

Table 3 presents the frequency distribution of various diagnostic modalities used in the evaluation of abdominal tuberculosis. The table highlights the number of patients in which each diagnostic modality was employed. The most commonly used diagnostic modality was abdominal ultrasound, which was performed in 60 patients, followed by computed tomography (CT) in 45 patients. Acid-fast bacilli (AFB) staining, a technique used to detect the presence of tuberculosis bacteria, was utilized in 30 patients. Culture, a method for isolating and growing bacteria, including *Mycobacterium tuberculosis*, was performed in 25 patients. Finally, histopathological examination, which involves the microscopic examination of tissue samples, was conducted in 40 patients.

To enhance the discussion on the diagnostic approach and evaluation of abdominal tuberculosis, it is valuable to refer to relevant studies that have examined similar aspects. Several studies have investigated the diagnostic modalities and their utility in the diagnosis of abdominal tuberculosis, providing valuable insights into their effectiveness and role in clinical practice.

A study by Gupta et al. (2012)[16] evaluated the diagnostic accuracy of abdominal ultrasound in the detection of abdominal tuberculosis, highlighting its usefulness in identifying specific features such as lymphadenopathy and ascites. Another study by Lee et al. (2017)[17] compared the diagnostic performance of CT and ultrasound in abdominal tuberculosis and found CT to be more sensitive in detecting various manifestations of the disease.

In addition, Khan et al. (2014)[18] conducted a study on the role of AFB staining and culture in the diagnosis of abdominal tuberculosis, emphasizing their significance in confirming the presence of *Mycobacterium tuberculosis*. Singh et al. (2016)[19] evaluated the histopathological features of abdominal tuberculosis and found characteristic findings such as caseous necrosis and granulomatous inflammation to be helpful in establishing the diagnosis.

These studies, along with others, contribute to our understanding of the diagnostic modalities and their clinical utility in abdominal tuberculosis. By incorporating their findings and considering

the frequency table presented in Table 3, healthcare professionals can gain insights into the diagnostic approach and select the most appropriate modalities for accurate diagnosis and management of patients with abdominal tuberculosis.

### **Conclusion:**

Study provided valuable insights into the demographic characteristics, clinical presentation, and diagnostic modalities of patients diagnosed with abdominal tuberculosis. The findings revealed a diverse age distribution, with the majority of cases occurring in the age groups of 21-40 years. The study also highlighted the higher prevalence of comorbidities such as HIV, diabetes, hypertension, and the association of these conditions with abdominal tuberculosis.

Regarding the clinical presentation, common symptoms such as abdominal pain, weight loss, and fever were observed in a significant proportion of patients. Specific physical findings such as ascites, abdominal mass, and lymphadenopathy were also documented. These findings contribute to our understanding of the clinical spectrum of abdominal tuberculosis and can aid in early recognition and diagnosis.

The study further explored the diagnostic modalities employed in the evaluation of abdominal tuberculosis. Abdominal ultrasound and computed tomography (CT) emerged as commonly used imaging techniques, while acid-fast bacilli (AFB) staining, culture, and histopathological examination were employed for confirmatory diagnosis. These diagnostic modalities play a crucial role in identifying and confirming the presence of abdominal tuberculosis, assisting in appropriate management decisions.

It is important to note that the findings of this study align with previous research in the field, as supported by references to relevant studies. These studies have contributed to the understanding of the clinical characteristics and diagnostic approach in abdominal tuberculosis.

Overall, the study provides valuable insights into the clinical profile and outcome of patients with abdominal tuberculosis in the context of Andaman and Nicobar Islands. The information gained from this study can contribute to improved diagnosis, management, and ultimately better outcomes for patients with abdominal tuberculosis. Further research and collaboration are necessary to enhance our understanding of this complex disease and improve patient care.

### **Limitations of Study:**

1. **Sample Size:** The study's sample size of 111 patients may be relatively small, which could limit the generalizability of the findings to a larger population. A larger sample size would provide a more comprehensive understanding of the clinical profile and outcome of abdominal tuberculosis in the region.
2. **Single-Center Study:** The study was conducted at a single center in Andaman and Nicobar Islands. This may introduce selection bias and limit the representativeness of the findings to other healthcare settings or populations. Multi-center studies involving diverse populations would provide a more robust analysis of the clinical profile and outcomes of abdominal tuberculosis.
3. **Retrospective Design:** The study utilized a retrospective design, which relies on data collected from medical records. This design introduces the possibility of incomplete or missing data, as well as potential bias in the documentation of clinical information. Prospective studies with a standardized data collection process would offer more reliable and comprehensive results.

4. **Limited Follow-up:** The study may have limited information on long-term outcomes and treatment response due to a lack of extended follow-up. A longer follow-up period would provide a more thorough assessment of treatment outcomes, recurrence rates, and the overall prognosis of patients with abdominal tuberculosis.
5. **External Validity:** The study focused specifically on the population in Andaman and Nicobar Islands, which may have unique demographic characteristics, healthcare resources, and cultural factors that could influence the clinical profile and outcome of abdominal tuberculosis. Therefore, caution should be exercised when generalizing these findings to other regions or populations.
6. **Selection Bias:** The study may be subject to selection bias, as it included only patients who were diagnosed and treated for abdominal tuberculosis at the study center. This could potentially exclude patients who were not diagnosed or managed at the center, leading to an incomplete representation of the disease spectrum.

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