

Case Report

Outcome of Abdominal Tuberculosis Complicated by Portal Hypertension, Pulmonary Tuberculosis, and Severe Acute Malnutrition

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Abstract:

Background: Abdominal tuberculosis (TB) is a form of extrapulmonary TB that can present with or without involvement of the lungs. The diagnosis is difficult to establish, which may lead to diagnostic delays. Effective management of adolescent TB requires a holistic approach from various medical disciplines and interventions. This case presented a rare case 13-year-old girl diagnosed with abdominal TB

Case: A 13-year-old girl presented with seven-months history of subfebrile fever, lymph node enlargement, abdominal distention, pallor, and severe weight loss. She was diagnosed with abdominal TB. The diagnosis was further complicated by portal hypertension, pulmonary TB, and severe acute malnutrition. To address these challenges, a multidisciplinary treatment plan was implemented and closely monitored for a period of 12 months

Discussion: Multiple factors are significantly contributing to the successful outcome of the treatment for abdominal tuberculosis, including good adherence to the prescribed anti-tuberculous medications, absence of side effects from the drugs, the patient's positive knowledge, attitude and health behaviours, and housing and environmental health.

Conclusion: This case highlights the importance of factors influencing disease outcomes of abdominal TB. Proper management of the factors would lead to significant clinical and nutritional status improvement, reduce TB transmission, and improved the overall quality of life.

Keywords: abdominal tuberculosis, adolescent, malnutrition, portal hypertension

Introduction

Tuberculosis is one of the disease that significantly contributing to the mortality and morbidity of children worldwide. According to World Health Organization (WHO), pediatric tuberculosis (particularly age < 15 years old) accounts for approximately 12% of the estimated total case of tuberculosis and 16% all tuberculosis-related deaths.¹ Abdominal tuberculosis (TB) is a form of extrapulmonary TB that can occur with or without pulmonary focus. Establishing the diagnosis of abdominal TB is often difficult due to the unclear symptoms, non-specific signs, and a lack of definitive diagnostic tests, leading to the delay of diagnosis.² This study presented a longitudinal case of a patient diagnosed with confirmed bacterial pulmonary TB, abdominal TB complicated by esophageal varices secondary to portal hypertension, and severe acute malnutrition.

Case

Case Illustrations

A 13-years-old-girl presented with seven-months history of persistent subfebrile fever, a progressively enlarging lump on the right side of the neck, abdominal distention, pallor, reduced appetite and significant weight loss (body weight dropping 9 kilogram in 5 months). Laboratory results revealed hypochromic microcytic anemia, hypoalbuminemia and positive IGRA. Both acid-fast bacilli (AFB) staining and GeneXpert sputum examination results were positive, confirming the diagnosis of tuberculosis. Lymph node biopsy revealed necrotizing granulomatous lymphadenitis, supported the clinical diagnosis. Abdominal ultrasound and Doppler showed acute inflammation of the liver parenchyma, ascites, splenomegaly, and decreased portal vein velocity with dilation of the splenic vein indicating early signs of portal hypertension. Subsequent abdominal CT scan revealed ascites and multiple lymphadenopathies in the mesentery and peritoneal nodules. Gastroscopy with biopsy demonstrated Grade II esophageal varices, esophagitis, and erosive gastritis. Additionally, ascitic fluid analysis revealed transudate impression, results (SAAG) 1.25 with interpretation SAAG >1.1, protein 2.78 (>2.5), PMN 2%, MN 99%, indicating portal ascites.

Patient was diagnosed with abdominal TB complicated with esophageal varices due to portal hypertension, confirmed bacterial pulmonary TB, and marasmic malnutrition. A 12-months ATD regimen was then initiated with rifampicin(R), isoniazid(H), pyrazinamide(Z), and ethambutol(E) were given during the intensive phase for 2 months. Prednisone was also administered in the first 2 weeks of therapy and subsequently tapered off. The regiment was continued with RH for 10 months in the continuation phase. Clinical responses and side effects were closely monitored during the period of therapy. Patient never had gastrointestinal bleeding episode during the course of therapy. However, during the first two weeks of therapy, patient experienced

nausea without vomiting. Patient close contacts were also identified during treatment, and her 3-years old younger sibling, presenting with no TB symptoms, were given TB prevention therapy (TPT). No side effects from TPT or development of TB symptoms were observed during therapy. Both parents were also examined and presented with no indications for TB.

Patient successfully completed the 12-month anti-tuberculosis drug (ATD) regimen. Abdominal distention stabilized and showed no further progression. Ascites was also completely resolved in the fourth month. Furthermore, weight gain was observed particularly during the intensive care and nutritional status was significantly improved in the end of therapy course. However, due to the COVID-19 pandemic, follow-up examination were unable to be conducted. For the pulmonary TB outcome, patient was classified as "completed treatment" as the post-treatment bacteriological examination were not feasible to be conducted. Meanwhile, patient was considered as clinically cured from abdominal TB as all pre-treatment signs and symptoms improved, despite the limitations of performing a follow-up abdominal CT scan due to the COVID-19 pandemic.

Besides pharmacological therapy, several evaluation and non-pharmacological intervention to the risk factors were also conducted to improve patient condition. Patient compliance was assessed in two aspects: regular medication intake and appointment attendance. Interventions to promote adherence included education, providing Drug Swallowing Control (DSC) techniques, and tracer method via messages. Patients regularly attending visits every two weeks during the intensive phase and monthly during the continuation phase. Patient also took her medicine regularly during the intensive phase. However, during the continuation phase, patient reported missed doses over consecutive days as she forgot to bring her medicine during travelling. Despite the missed dosages, patient therapy adherence observed using MMAS-8 (Medication Morisky Adherence Scale) questionnaire exhibited high level of adherence, with the total score of 8.

Patient and her family's knowledge and health behavior regarding TB were assessed using a questionnaire similar to one employed by the Indonesian Ministry of Health in 2004. The result exhibited a lower level of knowledge on several aspects of TB during the initial assessment. However, after further education, improved knowledge upon the disease were observed. Furthermore, the patient family sought medical attention from the beginning and utilized appropriate healthcare facilities, indicating positive health attitudes and behaviors. Based on home visits and evaluation using indicators established by the National Socioeconomic Survey, several environmental factors were identified and resolved through educational intervention. At the end of the observation period, several improvements were established, including sufficient

sunlight and air circulation to the patient's room, and elimination of cigarette smoke exposure from patient's father. Patient's quality of life using the PedsQL 4.0 score were also assessed, revealing a score lower than 70, indicating low quality of life. However, the result improved during treatment.

Discussion

This paper described the prognostic factors and disease outcomes contributing to a patient presenting with pediatric abdominal TB with complication of Esophageal Varices secondary of Portal hypertension, Pulmonary TB and severe acute malnutrition. The prognostic factors analysed include medication adherence, patient behavior, attitude, and knowledge, house and environmental health, and the risk of transmission. Meanwhile, the outcome evaluated in this study include the treatment results, complications, side effects, nutritional status, and quality of life.

Prognostic Factors

Medication Adherence

Overall, the patient demonstrated good compliance to the treatment regimen. Based on the MMAS-8 (Medication Morisky Adherence Scale) questionnaire, the patient showed a high level of adherence. Furthermore, the patient followed the recommended appointment schedule, as per the 2016 Indonesian Ministry of Health guidelines.³ Despite the high level of overall compliance, patient did miss to take several medical doses during the continuation phase as she forgot to take her medicine during traveling. This finding aligns with research by Adane et al., which identified forgetting medication (34%), experiencing vomiting (24%), and traveling (17%) as the most common reasons not to take the medicine.⁴

Behavior, Attitude, and Knowledge

Patient and her family exhibited lower level of knowledge on the initial assessment. Similar results were obtained on the TB prevalence survey held by the Ministry of Health in 2024. The survey showed that despite 85% of the respondent were aware that TB is curable, only 26% of them able identify TB signs and symptoms correctly, and only 19% knew that anti-tuberculosis drugs (ATD) are free.⁵ However, a significant improvement on the assessment were seen after educational interventions, indicating better understanding upon TB.

The patient's family also displayed positive health attitudes and behaviors by seeking medical attention promptly and utilizing appropriate healthcare facilities, despite their initial knowledge gap. These behaviors contrasts with national data from the Health Research and Development Agency, which indicated that 26% of respondents with suspected pulmonary TB symptoms did not go to a health professional.⁶

Housing and Environmental Health

The quality of housing and surrounding environment can significantly influence TB outcomes. Several environmental issues were detected in patient household, particularly cigarette smoke exposure for patient's father. The issue of indoor air pollution from cigarette smoke is a major concern highlighted by the World Health Organization's 2016 housing health guidelines. Cigarette smoke exposure posed a significant health risk to all occupants, as it is linked to various diseases.⁷ Furthermore, research suggests that exposure to cigarette smoke can impair the ability of alveolar macrophages to express cytokines, potentially disrupting TB treatment effectiveness.⁸

Risk of Transmission

According to Indonesian Ministry of Health Regulation No. 67 of 2016, tuberculosis preventive therapy (TPT) is recommended for children under five who are in close contact with active TB patients, individuals living with HIV patient without TB diagnosis, and other specific populations.³ However, challenges such as low adherence and completion rates to the therapy are commonly associated with TPT. In this case, TPT were given to patient's younger sibling for six months. Both parents also received examination for TB. This is aligned with the regulation established by the Ministry of Health regarding the identification and prevention protocol for potential transmission of TB.

Disease Outcomes

Treatment Outcome

Patient demonstrated a positive clinical response in all treatment phases. In the end of treatment, gastrointestinal symptoms such as abdominal distention and ascites were subsided. Nutritional status, a known predictor to treatment efficacy, also improved significantly, with weight gain observed during the intensive phase, as reported in other studies.⁹ Given the favorable clinical response, surgical intervention was not needed, which aligns with research by Mandavdhare et al. where surgery was only necessary in 8.6% of abdominal TB cases.¹⁰

The outcome of abdominal TB was classified as clinically cured as all pre-treatment signs and symptoms were improved despite the limitations of performing a follow-up abdominal CT scan due to the COVID-19 pandemic. This positive response reflects the generally good response to anti-TB drug (ATD) observed in pediatric abdominal TB cases.¹¹

Meanwhile, the result of pulmonary TB were classified as “completed treatment” due to the absence of a post-treatment bacteriological examination. This result aligns with data from the Indonesian Ministry of Health's TB treatment evaluation, where majority of cases achieved positive outcomes: 43.1% completed treatment, 42.0%

recovered, disappeared from observation 5.4%, moved 4.0%, died 2.5%, not evaluated 2.7%, and failed 0.4%.¹²

Complications of Abdominal TB

The complications anticipated and observed in this patient were directly attributable pulmonary and abdominal tuberculosis. Initially, patient presented with portal hypertension and esophageal varices as complications of abdominal TB. Other complications, including those resulting from the infection or as a consequence of the anatomic lesions, may also occur.

Abdominal ultrasound and Doppler revealed signs suggestive of early portal hypertension. While abdominal TB can lead to various complications, portal hypertension with esophageal varices complication is rarely reported, particularly in children. A search of literature identified one case report by Li Feng describing a 33-year-old man with abdominal TB and portal hypertension who required splenectomy, surgical porta-azygous devascularization, and splenorenal shunt to manage the complications. Two years post-surgery, patient was symptom-free, with CT showing transformation of the portal cavernous vein and esophagogastroduodenoscopy revealing the loss of varices and portal hypertensive gastroenteropathy.¹³ This treatment could be an alternative choice for portal hypertension with esophageal varices in abdominal TB. However, its efficacy and safety in children still require further observation.

The gastroscopy of our patient revealed grade II esophageal varices, esophagitis, and erosive gastritis. These findings are likely due to the portal hypertension itself, where increased blood flow within the portal vein and resistance to portal blood flow can lead to these complications.¹⁴ Unfortunately, due to the surge in COVID-19 cases at the end of the treatment period, planned follow-up evaluations with Doppler ultrasound and gastroscopy could not be performed. However, patient complication did not worsen until the end of treatment course, indicating appropriate management.

This case report is believed to be the first to document esophageal varices as a complication of abdominal TB in a child. Even in the adult population, only six cases have been reported, one of which was a case of a 30-year-old woman presenting with hematemesis and melena due to esophageal varices secondary to abdominal TB.²

Side Effects of ATD

During observation, side effects occurred in the intensive phase, consistent with findings from a study by Abdusalomova M. et al. This study identified gastrointestinal complaints as the most frequent side effects in children.¹⁵ In this case, our patient exhibited nausea without vomiting during the first two weeks of therapy. Taking ATD

at night, as described in the same study, can be a helpful strategy to manage these gastrointestinal side effects, which often improve without medication.³

One important side effect to watch for is hepatotoxicity, which can be caused by ATD medications like isoniazid, rifampicin, or pyrazinamide. Previous studies have shown that isoniazid is associated with hepatitis, with a reported incidence of hepatotoxicity ranging from 0.8% to 16.2% in children.¹⁶ Fortunately, this patient did not exhibit any signs of hepatotoxicity during treatment. It's important to note that, while less common than in adults, ATD side effects can still occur in children. To support the safety profile, Naude et al. conducted a prospective study in South Africa, observing no adverse effects in 306 children. Similarly, a prospective study in United States reported only 1% of patients experiencing delays of ATD due to vomiting and skin rashes.⁹

Nutritional Status

A study by Téllez-Navarrete N. et al. found an association between malnutrition and a higher rate of TB relapse.¹⁷ Consistent with these findings, our patient experienced significant weight loss (25%) since the illness onset. As reported by Kant S. et al., weight loss or malnutrition in TB patients is often attributed to several factors, including inadequate protein intake, catabolism due to inflammatory responses during infection, and gastrointestinal symptoms caused by the body's acute-phase proteins.¹⁸ Fortunately, the patient's nutritional status improved alongside her TB treatment. By the end of the observation period, she achieved a normal nutritional status with a healthy diet and good intake.

Quality of Life

Tuberculosis (TB) can negatively impact a patient's quality of life across various domains, including physical, psychological, financial, and social aspects. The initial PedsQL 4.0 score of our patient indicated a decreased overall quality of life, with a score lower than 70. This finding aligns with research by Lusmilasari et al., who reported that 80% of children and adolescents diagnosed with TB experience a decline in quality of life.¹⁹ Several factors contribute to this decline, such as the lengthy treatment duration, potential side effects of anti-tuberculosis drugs (ATD), social stigma, and social isolation.

While Lusmilasari et al. identified social function as the most affected domain in their study population of children and adolescents, the primary domain affected in this case was physical function.¹⁹ This discrepancy could be attributed to the patient's age (teenager), where physical appearance may hold greater significance.

The quality of life of TB patients improved as treatment began, signs and symptoms of TB began to disappear.²⁰ This case study further demonstrates that the patient's quality of life score improved alongside the treatment progression.

Conclusion

The patient achieved a good overall outcome at the end of the observation period, demonstrating significant clinical improvement and improved nutritional status. Due to limitations imposed by the COVID-19 pandemic, a final treatment outcome classification of "completed treatment" was assigned, as neither a follow-up sputum smear nor an abdominal CT scan could be performed. Despite the lack of these evaluations, the patient's complications of portal hypertension and esophageal varices showed no clinical signs of worsening. Hepatic Doppler ultrasound and gastroscopy follow-up were also postponed due to the pandemic.

Transmission prevention efforts were successful. Contact tracing identified the patient's sister, who received preventive treatment with TPT. The patient's quality of life also improved concurrently with their clinical recovery.

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Conflict of Interest

None declared.

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