

CASE REPORT: MILLIARY TB IN ADOLESCENCE DIAGNOSED IN TAPIN, SOUTH KALIMANTAN, A CALL FOR TB AWARENESS

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Abstract

This case report presents the clinical scenario of a 15-year-old adolescent admitted to the emergency room with complaints of shortness of breath and a persistent productive cough for the past 3 weeks, despite over-the-counter medication. The cough did not improve with over-the-counter medication. He also sometimes noticed blood stains in his phlegm. During the physical examination, a BCG scar was found on the right upper arm. The results showed that positive HIV status and the absence of BCG scars were significantly associated with miliary TB and extrapulmonary TB. However, in this case, both factors were not detected. The treatment regimen for miliary TB requires therapy for a minimum of 12 months, but teenagers experience difficulties in undergoing therapy due to the consumption of illegal drugs every day for a long period of time. Apart from that, social isolation and disrupted daily activities are also challenges for teenagers. The death rate from miliary TB in children reaches 15-20%, highlighting the importance of awareness of this disease. Therefore, handling and treating TB in adolescents requires special attention and further efforts to reduce the risk of treatment failure. Awareness of TB, especially in adolescents with chronic respiratory symptoms, must be increased to overcome this challenge in the future.

Keywords: TB, Billion TB, Teenagers

Introduction

Tuberculosis (TB), or what is often called TB, is one of the main causes of death due to lung infections. Indonesia is ranked second for the highest number of TB cases in the world after India (Baliasa et al., 2021; Santjoko et al., 2024). In 2022, more than 724,000 new TB cases were reported, and this figure increased to 809,000 cases in 2023. This number is much higher compared to cases before the pandemic, where the average discovery was below 600,000 per year. The TB detection procedure is similar to Covid-19 detection, where if testing, detection and reporting are not carried out properly, the number of recorded cases will be low, causing a lack of actual data reporting and resulting in TB sufferers not receiving appropriate treatment, which in the end at risk of transmitting the disease because it is not treated (Rokom, 2024).

Miliary tuberculosis (Milier TB) is a pathological condition characterized by the presence of small granulomas the size of millet seeds, which are yellowish in color, and can be found scattered in various organs of the body. This is caused by the spread of Mycobacterium tuberculosis through blood vessels and lymph nodes. The term "milier TB" was first used by John Jacob Manget in the 18th century, derived from the Latin "milierius" meaning related to millet seeds. Miliary TB is often fatal and can attack organs that have many phagocytic cells in the sinusoid walls (Pratiwi & Ramadhani, 2024).

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The cause of miliary TB is the spread of *Mycobacterium tuberculosis* complex bacilli. This bacillus is rod-shaped or slightly curved, has a length of around 2-5 μm , and a thickness of around 0.2-0.3 μm (Azizah, 2018). *Mycobacterium tuberculosis* is aerobic, does not move, does not form spores, and does not have a protective layer. Miliary TB that occurs due to primary infection usually has an acute and progressive start, while miliary TB that occurs due to reactivation can cause episodic or chronic symptoms. Symptoms tend to be non-specific and generally include fever, weight loss, loss of appetite, and weakness. Other symptoms can vary depending on the organ infected by TB (Pratiwi & Ramadhani, 2024).

Children have a higher risk of experiencing Miliary Tuberculosis (Miliary TB) (Utami et al., 2021). Although national TB programs in almost all countries do not prioritize childhood TB, because they are not the main cause of TB transmission in the community, this view is not entirely accurate. Handling TB in children has an important role in the TB control program for several reasons. Children have a high risk of being infected with TB, especially infants and toddlers. Children infected with TB have the potential to experience severe TB disease and have fatal consequences or long-term disability. Apart from that, teenagers (aged 10-19 years) are also susceptible to TB disease, generally in an infectious form and can transmit this disease to people around them (Kementerian Kesehatan, 2023).

Based on the above, a case report was carried out regarding Miliary TB in teenagers diagnosed in Tapin, South Kalimantan to increase awareness of the importance of tuberculosis (TB) in society. Through this case, it is hoped that it can clarify the condition of Miliary TB in adolescents as well as the challenges faced in the diagnosis, treatment and management of this disease in this area. Another aim is to provide better information to the public regarding the symptoms, spread and treatment of Miliary TB, as well as to encourage appropriate preventive measures and treatment. Moreover, this research aims to present a case of TB in an adolescent, discussing the clinical presentation, diagnosis, treatment challenges, and implications for management.

Case Report

History

M.A.G, a 15-year-old boy presented to the emergency room with a chief complaint of shortness of breath. He had been suffering productive cough in the last 3 weeks. The cough was not improved by over-the-counter medication. He also witnessed stains of blood in the sputum sometimes. He lost almost 10 kgs despite his normal appetite. He also complained of fatigue easily after doing light daily activities. He lives with his parents and a nine-year-old brother. He was previously a healthy child with no history of hospitalization. The other family member in the house did not show any symptoms. The parents denied any history of allergic disease in the family. His basic immunization record was not available upon admission but the mother recalls a complete immunization based on national immunization program. He also received 2 doses of COVID-19 immunization this year. He is a normal 10th grader without any trouble in terms of following subjects in school. He is a passive cigarette smoker in his peer group. He denied any close contact with either a tuberculosis patient or a confirmed covid-19 patient. He was sexually inactive. He never received any blood component transfusion.

Physical examination

Upon admission, he seemed breathless but still able to talk in full phrases. His vital sign showed tachycardia (heart rate 135 times/minute), tachypnea (respiratory rate 25

times/minute), decrease oxygen saturation at room air (91-92%), normal axilla temperature (36.8°C), and normal blood pressure (96/66 mmHg). His current body weight was 41 kg and his height was 172cm. Based on the CDC growth chart, his ideal body weight based on his actual height was 58 kg. His BMI was 13.8 kg/m² which was less than the 5th percentile on the BMI/age of CDC curve. The chest movement was symmetrical with mild intercostal retraction. No palpable mass on the chest wall. The ronchi can be heard in all lung fields. No heart murmur on auscultation. A BCG scar was noted on the right upper arm. Neither lymph node enlargement nor joint inflammation was present. His fingers were normal, no organomegaly, and there was no jugular vein pressure increment. The other systemic examination was normal.

Working Diagnosis and Investigations

1. Working diagnosis:
 - a. Pulmonary tuberculosis
 - b. Pneumonia
 - c. COVID-19 infection
 - d. Lung carcinoma
2. Investigations:
 - a. Blood test

Table 1. Blood test result

Parameter	Result	Normal range
Hemoglobin (g/dl)	12.2	12.8-16.8
Leukocyte (10 ³ /ul)	21.5	4.5-12.5
Lymphocyte (%)	13	
Granulocyte (%)	69	
Mid (%)	18	
Erythrocyte (10 ⁶ /ul)	4.44	3.8-5.8
Hematocrit (%)	35	33-45
Thrombocyte (10 ³ /ul)	385	140-392
SGOT (U/l)	49	<50
SGPT (U/l)	51	<50
Urea (mg/dl)	24	8-24
Creatinine (mg/dl)	0.6	0.62-1.1
Rapid HIV test	Non reactive	Non reactive

- b. SARS-Cov-2 Antigen swab test: Negative
- c. SARS-Cov-2 PCR swab test: Not available
- d. Sputum smear microscopy test: Positive for acid-fast bacill
- e. Rapid molecular test (Xpert MTB/RIF with sputum specimen): MTB detected high. Rifampicin resistance not detected
- f. Thorax X-ray: miliary TB appearance, no pleural effusion.



Figure 1. Thorax X-ray

Final diagnosis, management, and progress

The patient was admitted to an isolation room due to suspicion of pulmonary infectious diseases. He was initially treated with supportive care and antibiotics for pneumonia which were intravenous Ceftriaxone (50mg/kg body weight/12 hours) and Azithromycin (15mg/kg body weight/24 hours in day 1 then 7.5 mg/kg body weight/24 hours) orally for 5 days. The final diagnosis was miliary Tuberculosis (TB) based on the investigation panels. The TB drugs were started on day 3 of hospitalization with the regimen of 2RHZE / 10RH. He takes 3 tablets of fixed-dose combination TB drugs daily. The patient was discharged on day 7. We report the case to the district health officer and local primary health care to plan close contact investigations and observe TB drug compliance.

Results and Discussion

In the case of a 15-year-old boy and still a 10th grade student, data to the emergency room because he had complaints of shortness of breath. Although shortness of breath his vital signs showed tachycardia (heart rate 135 times/minute), tachypnea (respiratory rate 25 times/minute), decreased oxygen saturation in room air (91-92%), normal axillary temperature (36.8°C), and normal blood pressure. Based on the diagnosis, it was found that the boy had lung tuberculosis, pneumonia, covid-19 infection, and lung carcinoma. So the patient was put into isolation due to suspected pulmonary infectious diseases. Then, the final diagnosis based on the investigation panel was miliary tuberculosis (TB).

Tuberculosis (TB) remains a health problem globally with more than 5 million people are newly diagnosed with TB. Our country, Indonesia, ranks 2nd in the world for TB incidence with 312 per 100,000 population. TB may have a broad spectrum of symptoms which may similar to other infectious diseases. In our case, the patient showed respiratory symptoms which lasted for around 3 weeks accompanied by significant loss of weight. A particular x-ray appearance can highly suggest miliary TB. A study conducted in Sanglah Hospital Bali concluded that positive HIV status and no BCG scar were associated significantly with miliary TB and extrapulmonary TB (Utami et al., 2021). However, in our case both factors were absent.

Tuberculosis (TB) is a major cause of morbidity and mortality worldwide. TB is a disease caused by the pathogenic germ mycobacterium tuberculosis (Diantara et al., 2022). Miliary TB occurs when the bacteria spread through the bloodstream, affecting multiple organs throughout the body. Miliary TB may present as overt adrenal insufficiency (Addison's disease) at first onset or during antitubercular treatment. Manifestations

include skin hyperpigmentation, hypotension, hypoglycemia, and electrolyte imbalance (Vohra & Dhaliwal, 2024).

Miliary tuberculosis is a form of tuberculosis characterized by widespread spread into the human body with small size lesions (1-5 mm), the name comes from the characteristic pattern seen on chest x-ray of many small spots distributed throughout the lung fields with an appearance similar to millet seeds, thus called 'miliaria' TB. Miliary tuberculosis is a type of tuberculosis that varies from slowly progressive infection to acute fulminant disease, it is caused by hematogenous or lymphogenous spread of infected vessels into the bloodstream and affects multiple organs (Arsyad & Fauzar, 2018).

TB treatment is the most efficient way to cure, reduce the spread of TB-causing bacteria, prevent death and drug resistance. TB treatment requires a relatively long period of time with two stages of treatment, namely the intensive stage and the advanced stage to avoid relapse. Treatment must be adequate and generally drugs are given in the form of an OAT blend containing at least 4 types of drugs to prevent resistance. Treatment with a combination of drugs can prevent resistance but can increase the possibility of drug side effects. Side effects will affect the patient's adherence to taking medication. Most patients who complain of mild and severe side effects often choose to discontinue treatment for fear that if the treatment is continued it will get worse and they cannot bear to continue (Ningsih et al., 2022).

The DOTS (Directly Observed Treatment Short Course) strategy is a direct supervision of short-term treatment with the obligation of every tuberculosis program manager to focus attention (direct attention) in an effort to find patients with microscope examination. Then each patient must be observed in swallowing the medicine, every medicine swallowed by the patient must be in front of a supervisor. Patients must also receive treatment that is organized in the management system, distribution with sufficient supply of drugs, then each patient must receive good drugs, meaning standard short-term treatment (short course) that has been clinically proven to be effective. Finally, there is an absolute need for government support to make TB control programs a high priority in health services (Inayah & Wahyono, 2019).

TB management is all health efforts that prioritize promotive and preventive aspects, without neglecting curative and rehabilitative aspects aimed at protecting public health, reducing morbidity, disability or death, breaking transmission, preventing drug resistance and reducing the negative impact caused by Tuberculosis.

Multidrug-resistant tuberculosis is treated with second-line treatment. This treatment is less effective than first-line drugs and has far more side effects. The treatment phases in this case were intensive phase and continuation phase. The intensive phase is carried out for at least 6 months with a drug combination of pyrazinamide, ethambutol, kanamycin, levofloxacin, ethionamide, and cycloserine and 18 months of follow-up phase with a drug combination of pyrazinamide, ethambutol, levofloxacin, ethionamide, and cycloserine (Sari, 2021).

The treatment regimen for miliary TB requires at least 12 months of therapy. This long period of daily drug consumption is a challenge for adolescents. They may lose follow-up or have poor compliance during 12 months of therapy. Furthermore, isolation from peer groups, school activities, and other daily activities can also be frustrating for some adolescents (Snow et al., 2020). The mortality rate of miliary TB in children is 15-20%. Hence, proper monitoring and good compliance are essential.

The incidence of tuberculosis is influenced by several factors. The first factor of tuberculosis is age because the highest incidence of tuberculosis is in young adulthood. In

Indonesia, it is estimated that 75% of tuberculosis patients are in the productive age group. The second factor is gender which affects more men than women, because most have smoking habits. The third factor is the habit of smoking, which can reduce the body's resistance, making it easy to get sick, especially in men who have a smoking habit. The fourth factor is the density of occupancy, which is an environmental factor, especially in people with tuberculosis, namely *M. tuberculosis* germs can enter houses that have dark buildings and no sunlight entering. The fifth factor is occupation, which is a risk factor for direct contact with patients. The sixth factor is economic status, which is the main factor in the family, as low income can infect people with tuberculosis because small income makes people unable to fulfill health requirements (Sejati & Sofiana, 2015).

The diagnosis of tuberculosis (TB) in adolescents with numbers reaching billions in Tapin, South Kalimantan, highlights the escalation of a public health problem that requires serious attention. This phenomenon underscores the urgency to raise awareness of TB, both in terms of prevention, detection and treatment. This reflects complex challenges within the health system, including access to appropriate health services, appropriate information about TB, and adequate support for treatment and monitoring. The call for TB awareness is becoming increasingly urgent in an effort to reduce the spread of the disease in the community, as well as to ensure that infected individuals receive appropriate and timely care. Collaboration between governments, health institutions, communities, and non-governmental organizations is needed to develop a holistic and sustainable strategy to tackle TB, strengthen public health systems, and achieve the global goal of eliminating TB.

Conclusion

A study conducted at Sanglah Hospital in Bali found that positive HIV status and the absence of BCG scars were significantly associated with miliary TB and extrapulmonary TB. However, in our case, both factors were not detected. The treatment regimen for miliary TB requires therapy for a minimum of 12 months. Daily use of illegal drugs over long periods of time is challenging for adolescents, who may have difficulty engaging in therapy over long periods. Apart from that, isolation from peer groups, school activities, and other daily routines can also cause feelings of frustration in some teenagers. The death rate due to miliary TB in children reaches 15-20%. Therefore, TB is a critical disease and must be paid attention to, especially in children with chronic respiratory symptoms, especially in Indonesia. To reduce the risk of treatment failure, more efforts are needed in the management and treatment of adolescents suffering from TB.

BIBLIOGRAPHY

- Arsyad, Z., & Fauzar, F. (2018). Tuberkulosis Milier dan HIV-AIDS dengan Drug-induced Hepatitis. *Jurnal Kesehatan Andalas*, 7, 92–95.
- Azizah, E. S. N. (2018). *Perbandingan tingkat kepositifan antara pewarnaan Basil Tahan Asam konvensional metode Ziehl-Neelsen dengan penambahan Bleach 2% untuk mendiagnosis tuberkulosis pada spesimen sputum*. Fakultas Kedokteran UIN Syarif Hidayatullah Jakarta.
- Baliasa, I. W., Kaundang, W. P. J., & Kairupan, B. H. R. (2021). Hubungan Pengetahuan, Sikap Dan Tindakan Penderita Tuberkulosis Dengan Hasil Terapi Di Puskesmas Biak Banggai. *Indonesian Journal of Public Health and Community Medicine*, 1(4), 63–69.

- Diantara, L. B., Hasyim, H., Septeria, I. P., Sari, D. T., Wahyuni, G. T., & Anliyanita, R. (2022). Tuberkulosis Masalah Kesehatan Dunia: Tinjauan Literatur. *Jurnal Aisyiyah Medika*, 7(2).
- Inayah, S., & Wahyono, B. (2019). Penanggulangan Tuberkulosis Paru dengan Strategi DOTS. *HIGEIA (Journal of Public Health Research and Development)*, 3(2), 223–233.
- Kementerian Kesehatan. (2023). *Petunjuk Teknis Tata Laksana Tuberkulosis Anak Dan Remaja*. <https://tbindonesia.or.id/wp-content/uploads/2024/02/Final-Petunjuk-Teknis-Tata-Laksana-TBC-Anak-dan-Remaja-2023.pdf>
- Ningsih, A. S. W., Ramadhan, A. M., & Rahmawati, D. (2022). Kajian Literatur Pengobatan Tuberkulosis Paru dan Efek Samping Obat Antituberkulosis di Indonesia: Literature Review of Treatment of Pulmonary Tuberculosis and the Antitubercular Drug's Side Effect in Indonesia. *Proceeding of Mulawarman Pharmaceuticals Conferences*, 15, 231–241.
- Pratiwi, J. M. R., & Ramadhani, I. C. (2024). *Tuberkulosis Milier, Apakah sama dengan penyakit TBC ?* [http://rsudajibarang.banyumaskab.go.id/news/31972/tuberkulosis-milier-apakah-sama-dengan-penyakit-tbc#:~:text=Tuberkulosis milier \(TB Milier\) adalah,Jacob Manget pada tahun 1700](http://rsudajibarang.banyumaskab.go.id/news/31972/tuberkulosis-milier-apakah-sama-dengan-penyakit-tbc#:~:text=Tuberkulosis milier (TB Milier) adalah,Jacob Manget pada tahun 1700)
- Rokom. (2024). *Kasus TBC Tinggi Karena Perbaikan Sistem Deteksi dan Pelaporan*. <https://sehatnegeriku.kemkes.go.id/baca/rilis-media/20240129/2644877/kasus-tbc-tinggi-karena-perbaikan-sistem-deteksi-dan-pelaporan/#:~:text=Lebih%2520dari%2520724.000%2520kasus%2520TBC,pene muannya%252>
- Santjoko, H., Kasjono, H. S., Yamtana, Y., Primiaji, P., Widarto, E. S., & Putri, H. R. (2024). Sosialisasi Pencegahan Dan Penanggulangan Tbc Pada Pekerja Home Industri Batik Di Kalurahan Wijirejo, Kapanewon Pandak, Kabupaten Bantul, Daerah Istimewa Yogyakarta. *EJOIN: Jurnal Pengabdian Masyarakat*, 2(1), 30–36.
- Sari, M. (2021). Terapi Tuberkulosis. *Jurnal Medika Hutama*, 3(01 Oktober), 1571–1575.
- Sejati, A., & Sofiana, L. (2015). Faktor-faktor terjadinya tuberkulosis. *Jurnal Kesehatan Masyarakat*, 10(2), 122–128.
- Snow, K. J., Cruz, A. T., Seddon, J. A., Ferrand, R. A., Chiang, S. S., Hughes, J. A., Kampmann, B., Graham, S. M., Dodd, P. J., & Houben, R. M. (2020). Adolescent tuberculosis. *The Lancet Child & Adolescent Health*, 4(1), 68–79.
- Utami, D. A., Purniti, N. P. S., Subanada, I. B., & MM, A. S. (2021). Faktor Risiko Infeksi Tuberkulosis Milier dan Ekstraparu pada Anak Penderita Tuberkulosis. *Sari Pediatri*, 22(5), 290–296.
- Vohra, S., & Dhaliwal, H. (2024). *Miliary Tuberculosis*. *StatPearls*.

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