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Disseminated Tuberculosis in Breastfeeding Mother: A Case Report

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ABSTRACT

Background: Disseminated tuberculosis is defined as the involvement of two or more extrapulmonary organs due to *Mycobacterium tuberculosis* infection, which spreads hematogenously. Disseminated tuberculosis is a life-threatening condition, especially if diagnosis and treatment are delayed. This study aimed to describe disseminated tuberculosis in a breastfeeding mother. **Case presentation:** A 21-year-old woman was admitted to Dr. M. Djamil General Hospital with chief complaints of shortness of breath. The symptoms were accompanied by chronic cough, fever, night sweats, and weight loss. From the physical examination, there was a decrease in left lung breath sounds as high as right intercostal V. On the gene expert results, the PCR was positive for *Mycobacterium tuberculosis*. Chest X-ray shows a miliary pattern and left pleural effusion. Pleural fluid analysis reveals the presence of exudate. Patients were treated with anti-tuberculosis drugs, namely Isoniazid, rifampicin, pyrazinamide, and ethambutol, with pyridoxine. Anti-tuberculosis drug therapy in the intensive phase is given for 2 months and is continued for 6-9 months for the continuation phase, depending on the patient's clinical condition. Breastfeeding was still continued in this case. The patient's baby is advised to be evaluated for active tuberculosis. **Conclusion:** There are no contraindications for giving anti-TB drugs to breastfeeding mothers unless the mother has mammary TB or drug-resistant TB. In children under 5 years who have close contact with active tuberculosis patients and, after being evaluated, do not have active tuberculosis, the child is treated as suspected latent TB infection with Isoniazid for at least 6 months and accompanied by pyridoxine administration.

1. Introduction

Tuberculosis (TB) most commonly occurs during women's reproductive years and is a major cause of maternal-child mortality.¹ In the UK in 2008, the incidence of TB in pregnancy was 4.2 per 100,000 pregnancies.¹ In Indonesia, TB ranks in the top five, with the number of TB sufferers in Indonesia around 5.8% of the total TB sufferers in the world.² The TB prevalence rate in Indonesia in 2016 was 391 per 100,000 population, and almost half of them were women and mostly suffered by women their productive age. Approximately 1-3% of pregnant women suffer from tuberculosis, and there are 16 pregnant women

with active tuberculosis, and 11 cases of them are HIV positive. Disseminated tuberculosis is defined as the involvement of two or more extrapulmonary organs due to *Mycobacterium tuberculosis* infection, which spreads hematogenously.

Miliary TB is also a form of disseminated TB, which is defined as the spread of tuberculosis that occurs lymphohematogenously in the form of fine tubercles, such as rice seeds, to all organs. Miliary features are visible in the lung tissue, which can be confirmed by finding small nodules on the chest X-ray with a size of 1-2 mm spread over both lung fields. Disseminated TB is a life-threatening condition, especially if diagnosis

and treatment are delayed.³⁻⁵ This study aimed to describe disseminated tuberculosis in a breastfeeding mother.

2. Case Presentation

A 21-year-old post-partum woman was admitted with the main complaint of shortness of breath, which had increased since 3 days ago. Previously, the patient also complained of a chronic cough for more than 2 weeks, fever, night sweats, and weight loss. From previous medical history, the patient had no history of pulmonary TB or had ever taken anti-tuberculosis drugs. In addition, her sister was diagnosed with pulmonary TB and had just finished anti-tuberculosis medication 2 months ago. In admission to the hospital, her vital signs were as follows: blood pressure, 110/70 mmHg; pulse 102 beats/minute; breathing 26 times/minute; rectal temperature 37.8°C. Her body mass index is 14.58 kg/m². On physical examination,

no lymphadenopathy was found. On thoracic examination, there was a decrease in breath sounds in the left lung as high as RIC V. On laboratory tests, rapid anti-HIV screening was negative.

The chest radiograph shows a scattered miliary pattern over both lung fields and left pleural effusion (Figure 1). Thoracosynthesis is performed under ultrasonic guidance. Pleural fluid showed an exudate with a total protein of 3.6 g/dL and albumin of 1.5 g/dL. *Mycobacterium tuberculosis* polymerase chain reaction was also positive, with no rifampicin resistance found.

The patient was immediately started with anti-tuberculosis drug therapy when diagnosed with miliary TB. The patient got Isoniazid, rifampicin, pyrazinamide, ethambutol, and pyridoxine. The patient's baby is advised to be evaluated for active tuberculosis.



Figure 1. Patient's chest X-ray result.

3. Discussion

Disseminated tuberculosis (TB) is defined as the presence of two or more non-contiguous organs due to hematogenous spread of *Mycobacterium tuberculosis*, occurring as a result of progressive primary infection, reactivation of latent foci with subsequent spread, or rarely of iatrogenic origin. Currently, the term miliary

TB also refers to disseminated forms of TB, meaning that the infection spreads progressively and is widespread. To confirm the diagnosis in a patient with suspected disseminated TB, a chest X-ray and appropriate specimen selection is required for polymerase chain reaction (PCR), mycobacterial culture, and histology. In this case, we found

Mycobacterium tuberculosis detectable by PCR, miliary pattern from chest X-ray and results suggestive of exudate from the pleural analysis.⁶⁻¹⁰

Pregnancy suppresses the proinflammatory T-helper 1 (Th1) response, which can mask symptoms while increasing susceptibility to new infections and reactivation of tuberculosis. This effect is seen in other infectious diseases, such as the flu and *Mycobacterium leprae*, which are more common and severe during pregnancy. After delivery, Th1 suppression reverses — similar to immune reconstitution syndrome in HIV patients starting antiretroviral therapy (ART) — and symptoms worsen. A study conducted by Khan et al. found that early postpartum women have twice the risk of developing tuberculosis than non-pregnant women. These and other studies have shown that biological changes in pregnancy and postpartum influence tuberculosis epidemiology, challenging the findings of earlier smaller studies that found no effect. Practitioners should be aware of unexpected symptoms of tuberculosis during pregnancy.¹¹⁻¹³

Currently, no randomized controlled trials for the treatment of disseminated TB have been conducted, and most of the evidence is based on randomized controlled trials on the treatment of pulmonary TB. Although there is no consensus regarding the optimal duration of treatment in patients with disseminated TB, early initiation of therapy is associated with significantly improved outcomes.¹⁴⁻¹⁷

Based on the 2020 guidelines for the management of tuberculosis medical services, administration of anti-tuberculosis therapy for miliary TB can be started without waiting for culture results. The duration of administration of anti-tuberculosis drugs for disseminated TB is the same as the duration of extrapulmonary TB drugs; however, individualization regimens may be required. For example, for patients with high numbers of *Mycobacterium tuberculosis* organisms, slow clinical response, immunosuppression, CNS infections, and certain patients with bone and joint involvement and a longer duration of therapy may be required. Guided anti-tuberculosis drugs are given for 6-9 months if there is

no bone, joint and central nervous system involvement. The selection of the anti-tuberculosis regimen in this patient consisted of two phases, namely, rifampicin, Isoniazid (INH), pyrazinamide, and ethambutol/streptomycin which were given every day for the first 2 months. Therapy is then continued with rifampicin and Isoniazid for 6-9 months, depending on the patient's clinical condition. Anti-tuberculosis treatment in the advanced phase with joint, bone, or central nervous system involvement is given for 9-12 months. Administration of corticosteroids is indicated for central nervous and pericardial TB.¹

Breastfeeding is not contraindicated while on TB treatment. Although anti-TB drugs are found in breast milk, serum isoniazid levels in breast milk are less than 20% of usual therapeutic levels and less than 11% for other anti-TB drugs.^{18,19} For pregnant women who are taking tuberculosis drugs, it is best if the new baby to be born is given a prophylactic anti-tuberculosis drug, namely Isoniazid, at a dose of 5-10 mg/kg BW per day for 6 months. Pyridoxine should be given to both the baby and the mother if a regimen containing Isoniazid is used. Breastfeeding can be started after the mother has received anti-tuberculosis drugs for at least two weeks. In women with potentially infectious active TB, direct mother-infant contact should be avoided. Women can express their milk to feed the baby. Breast milk does not contain tuberculosis bacilli, except in women with active tuberculous breast lesions or confirmed MDR TB.¹⁷⁻¹⁹

In breastfeeding mothers who are diagnosed with tuberculosis, it is necessary to take screening for tuberculosis in children. Clinical symptoms such as cough, fever, shortness of breath, or weight do not increase the need to be explored. Follow-up examinations, such as chest X-rays or sputum, need to be done. Children must be ensured that they do not suffer from active tuberculosis and can be categorized as latent TB based on high-risk factors, namely, close contact with patients with active tuberculosis. Based on the 2020 guidelines for the management of tuberculosis medical services, children under 5 years of age who have close contact with active tuberculosis

patients and, after careful evaluation, do not have active tuberculosis, children are treated as suspected latent TB infection with Isoniazid for at least 6 months and accompanied by pyridoxine administration.¹

4. Conclusion

There are no contraindications for giving anti-TB drugs to breastfeeding mothers unless the mother has mammary TB or drug-resistant TB. There were no differences in the selection of regimens, doses, and duration of administration of anti-tuberculosis drugs in breastfeeding mothers. In children under 5 years who have close contact with active tuberculosis patients and, after being evaluated, do not have active tuberculosis, the child is treated as suspected latent TB infection with Isoniazid for at least 6 months and accompanied by pyridoxine administration.

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