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Case Report: Pulmonary Tuberculosis Relapse

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CASE REPORT

The patient is a 27-year-old married male, who does not work. Since contracting the tuberculosis (TB) illness, the patient complained of feeling tired and weak so he decided to stop working. The patient usually feels that rest helps the healing process of the pain and by not working, they feel more focused on the treatment of the disease because it requires them to go to the *Puskesmas* every day to get treatment. The patient's wife works as a rice trade worker. The patient has a 3.5-year-old daughter. The patient originally came from the Karangasem Regency, Tulamben, which is included in the red zone of the eruption of Mount Agung. So actually, this patient is a refugee. But he did not complete the documents as a refugee, so the patient did not get the recognized rights as a refugee like getting free medical treatment. The patient who does not have the Indonesia Health Card/*Kartu Indonesia Sehat* (KIS) is considered to not have any health insurance and is included in the lowest economic status.

The patient is the first child of three siblings and their parents died while the patient was still attending elementary school. According to the patient's story, both his parents and grandmother died of coughing up blood. He was then raised by his uncle and only completed his education through elementary school. After completing elementary school, he was invited to work in Denpasar to care for his uncle's child. For approximately 3 years, the patient took care of his uncle's child. After that the patient worked as a laborer planting strawberry in the cold area of Bedugul. He complained of not being strong there and returned to work in Denpasar cleaning wastewater in a villa. The work in the villa was quite heavy and he complained of coughing up phlegm for about a month, and also had decreased appetite, decreased body weight, and night sweats. As a result, the patient stopped working and went to the *Puskesmas* in his village. He explained that his complaints were felt since a

year ago. The doctor at the *Puskesmas* said that the patient had TB, and he received treatment for 6 months.

Two months later, the patient came to the *Puskesmas* again with a referral from Wangaya Hospital for relapsed TB which advised the treatment of category II Anti-TB Drugs. The patient was re-examined and his weight was measured to determine the oral medication dose. Every day he went to the *Puskesmas* to get 500 mg Streptomycin injection drug. One year before, the patient was diagnosed suffering from TB and underwent treatment for 6 months at the *Puskesmas* Kubu, Karangasem. Unfortunately, the patient did not bring his treatment card, but he said that sputum after two months of treatment was stated negative by the *Puskesmas* staff. After undergoing treatment for 6 months, the patient usually can go to work as usual. Approximately 3-4 months after treatment, the patient complained of coughing up phlegm for about 1-month, weak body, night sweats, no appetite, and his weight decreased dramatically from 45 kg to 32 kg. The patient then checked into the Wangaya Hospital. At the hospital, the sputum was examined and the result was AFB +2, so he was referred back to the *Puskesmas* nearest to the patient's residence. When the patient's weight and height were examined, his Body Mass Index (BMI) was in the category of lean patients. So that this was consulted to the nutrition officer at the *Puskesmas*. The patient is encouraged to follow the dietary advice of nutrition specialists. The patient may feel sick again after a year relapse, but he should know that the disease can be cured by regularly taking medication. The patient was worried that his constant coughing would become the bleeding cough. When the patient's treatment progressed, he did not complain about the effects of the drug, and felt his appetite begin to improve, then he was able to be active and his cough began to decrease, while his body weight increased to 36 kg. The patient's blood pressure was 110/70 mmHg, and other systems were still within normal limits.

The patient and his two younger siblings support each other. The two younger siblings also live in Denpasar, and since their income is mediocre, they cannot help the patient financially, but only provide moral support such as by telephone to find out each other's circumstances. The patient is also lacking in his big family support. The patient is strongly supported by his wife for treatment and she hopes that he can recover soon so that he can work again. The patient lives in a boarding house, and his room is well-lit and has adequate ventilation. The patient's family do not have the habit of washing their hands with soap. He also does not smoke. Because his body is still a little weak, the patient avoids physical activity. Since his income is still lacking, it creates a challenge to buy food every day. Most of the time the patient consumes packaged rice which is felt to be affordable. Of course, the consumption of packaged rice cannot meet the nutritional needs of the patient.

Biological Diagnosis and Psychosocial Diagnosis

The biological diagnosis in this patient is pulmonary TB relapse. Relapsed pulmonary TB is a patient with pulmonary TB who has received TB treatment and has been declared cured or completed treatment, then re-diagnosed as positive pulmonary TB through smear examination or sputum culture. The bacteria that causes relapse of pulmonary TB is *Mycobacterium tuberculosis*, and has the same genotype as the *M. tuberculosis* bacteria that caused the pulmonary TB before. From several studies regarding the incidence of pulmonary TB relapse, there are several factors that influence the incidence of pulmonary TB relapse, namely age, sex, occupation, nutritional status, smoking and alcohol habits, history of irregular treatment, and the presence of drug resistance in initial treatment.

Psychosocial diagnosis involves the patient's concern about pulmonary TB relapse and coughing up blood. The patient also feels that if the disease recurs, he will not be able to do activities such as work and will become a burden for his wife and children. When asked about the TB disease, the patient apparently did not understand very well about TB, treatment, and how to prevent it from returning.

FORMULATION OF THE PROBLEM

When he first came to take Anti-TB Drugs, the patient had received education from doctors and nurses. Even though TB can be cured if the medication is taken regularly, environmental cleanliness must be maintained, and nutritional status must be improved. The patient and families often lack knowledge and do not understand about Clean and Healthy Lifestyle/*Pola Hidup Bersih dan Sehat* (PHBS). This can be seen from giving birth at home, and rarely bringing the toddler to the Integrated Service Post/*Pos Pelayanan Terpadu (Posyandu)*, so there is not regular weighing every month. In the family there was also a bad habit of not washing hands with soap. The source of clean water used is in accordance with the safety requirements, where the distance of the clean water source with the sewerage channel is more than 10 meters, but there has never been chlorine water treatment. They defecate in the toilet. Patients often lack understanding about the transmission of pulmonary TB so there is a risk of transmission to the family and people in the neighboring boarding house. The

problems encountered in this case are not just about patient compliance in TB treatment. In fact, there are several problems that can be seen in this case, namely: (1) The treatment of the patient when he first took Anti-TB Drugs still cannot be clarified because there is no patient yellow card, so there is a possibility that TB will recur again. Patient compliance in taking Anti-TB Drugs is crucial for the recovery of this disease. Besides Compliance with Taking Medicines, there are several aspects that determine the cure of TB treatment, namely Compliance of patients to routinely check themselves to the nearest health facility in terms of *Puskesmas* and to maintain healthy living habits such as keeping healthy eating patterns, doing routine physical activity and stopping smoking. Compliance can be measured from: (a) Compliance with Taking Medicines; (b) Compliance is checked; and (c) Compliance in maintaining healthy living habits (diet, physical activity, anti-smoking); (2) The patient lives in a boarding house, so that the patient is at high risk of transmitting the disease to others if the patient does not know how to prevent the transmission of TB; (3) The patient has a malnutrition status (malnutrition) which affects the treatment and the patient does not understand the importance of balanced nutrition, while malnutrition and TB are interrelated. TB can aggravate malnutrition and malnutrition can also hamper the course of treatment so that proper nutritional intake is needed in patients in order for the TB treatment to be optimal; and (4) How to maintain PHBS by patients and their families, so that the risk of transmission to others can be avoided, the cure of the disease can follow its course, and the risk of recurrent disease can be avoided.

DISCUSSION

Efforts to dialogue with TB patients in this regard can be done with the following 8 questions from Arthur Kleinman¹:

1. What do you think is the cause of your illness?
According to the patient, the cause is fatigue and cold air.
2. When do you think this disease began?
The patient felt sick when he had a cough that did not heal.
3. What are the consequences of pulmonary TB that you know about?
As a result of the disease, the patient cannot work, because he feels weak.
4. According to you, is pulmonary TB easy to cure or requires a long period of time?
The patient knows that the disease can be cured if he goes for routine medical treatment.
5. What kind of treatment do you expect?
The treatment expected by the patient is a cheap and easy treatment he can manage.
6. What results do you expect from the treatment?
The expected results of the treatment are he hopes to recover and be able to work again.
7. What are the main complaints from pulmonary TB?
The main complaint that is felt is a cough that does not go away.
8. Are you worried mainly about this pulmonary TB?
The patient is mainly worried that because of his illness, he cannot work to fulfil his family responsibilities.

By knowing the patient's perceptions of the disease, the doctor will find out how much information and discussion should be given to the patient. In the case of this patient where the patient's knowledge is lacking and socioeconomic level is low but there was great motivation and hope to recover so the patient routinely went to the *Puskesmas* for treatment. Health workers routinely educate every patient who comes to the service about the cause of the disease, how to prevent it from spreading to others, and they remind patients about the importance of taking medication in compliance with prescription. They also give Supplementary Feeding/*Pemberian Makanan Tambahan* (PMT) for additional patient nutritional intake, while providing solutions to get a KIS and Family-Hope Program/*Program Keluarga Harapan*. Because the patient is incapable, the family can motivate the patient and to remain eager to undergo treatment to the end. Education on PHBS is delivered according to the level of patient's knowledge and delivered in simple language, while open-ended questions are made so that patients can better understand the education.

TB and Malnutrition

In this case a BMI of 14.61 was found, indicating the patient was lacking nutritional status. Accordingly, the patient's body weight is monitored every time he comes for treatment. For patients with socioeconomic disadvantages, where they cannot meet optimal nutritional needs, a number of solutions can be done by health workers other than routinely weighing the patient's body weight every day: for example, health workers can advise patients to submit a statement of disability in the patient's village so that later they can get help from the government in the form of KIS and can be registered in the Family-Hope Program/*Program Keluarga Harapan*. While the patient is taking care of this, for a while the patient can get help from the *Puskesmas* namely PMT for patients with Malnutrition. It is expected that the administration of PMT can help the patient's nutritional intake. TB can cause nutritional deficiencies that will delay recovery by suppressing immune functions^{1,2}.

Nutritional support can improve recovery in patients treated for TB. The role of the nutrition officer is to provide information about appropriate nutritional support for these patients.

Malnutrition and TB tend to interact with each other³. Malnutrition, which is the nutritional status that is lacking in TB relapse patients can increase the risk of death^{4,5}. Several studies report that the prevalence of malnourishment in TB patients is high at around >20%^{6,7,8,9}. In accordance with 2013 guidelines, TB is associated with poverty, malnutrition, poor immune function, nutritional deficiencies that can occur before and after the treatment results from TB¹⁰. It is known that TB causes worsening of malnutrition, lack of protein nutrition, micronutrient deficiencies, being in a catabolic state, weight loss or low BMI, loss of appetite, and fatigue. From another perspective, malnutrition is believed to make people more susceptible to TB and delay recovery by reducing cell-mediated immunity against *M. tuberculosis*, and thereby increasing the probability of latent TB developing into an active disease². In addition, malnutrition is known to affect TB treatment by reducing

the availability of some Anti-TB Drugs and by predisposing patients to drug-induced hepatotoxicity, which can cause therapeutic disorders and can be fatal.

TB Relapse

The number of new TB cases in Indonesia was 420,994 cases in 2017 (data as of May 17, 2018). By sex, the number of new TB cases in 2017 in males is 1.4 times greater than in females. Based on the TB Prevalence Survey, the prevalence in men is 3 times higher than in women. This trend is similar to other countries. This happens probably because men are more exposed to TB risk factors such as smoking and lack of compliance with taking medication⁷. TB recurrence rates in Indonesia vary widely and are estimated to range from 4.9% to 47%.

TB relapse continues to be a significant problem and is an important indicator of the effectiveness of TB control. There are several main factors associated with a high recurrence rate. Host factors that are widely recognized which do not depend on treatment programs that predispose patients to recurrence of TB include: gender differences, malnutrition; comorbidities such as diabetes, kidney failure, and systemic diseases, especially immunosuppressive conditions such as *human immunodeficiency virus*; substance abuse; and environmental exposures such as silicosis¹¹. To overcome the problems found in the case, it must first be known about the source of transmission of TB. The source of transmission is smear positive TB patients. Transmission of TB is caused by *M. tuberculosis* which is transmitted through the air when a TB patient coughs and sneezes^{12,13}. The patient spreads germs into the air in the form of a spark. One cough can produce about 3000 sputum splashes. Generally, transmission occurs in a room where sputum sparks exist for a long time. Ventilation can reduce the amount of spark, while sunlight can directly kill germs¹⁴. The power of transmission of a patient is determined by the number of germs released from his lungs. The higher the degree of positivity of sputum examination results, the more infectious the patient. Factors that cause a person exposed to TB bacteria to contract the disease are determined by the concentration of sparks in the air and the length of time inhaling the air. Every 1 positive AFB will transmit to 10-15 other people, so the possibility of each contact for contracting TB is 17%. The results of other studies report that the closest contact (for example, a family at home) will be twice the risk compared to a normal contact (not at home). In this case, the patient's child must be given INH prophylaxis, and the wife must have a sputum examination as well in order to find out whether the family has contracted the disease at home.

The patient must be taught how to have correct cough ethics. Cough ethics are good and correct cough procedures, done by covering the nose and mouth with a tissue or sleeve. As a result, the bacteria do not spread into the air and do not spread to others. It is also important to dispose of phlegm in the open air when exposed to sunlight. The patient should be given a mask and taught to always wear a mask when in contact with others. This reduces the risk of infecting others and transmission can be prevented by the patient wearing a mask.

Motivation for the Patient

Considering that the patient is currently treated with category II Anti-TB Drugs. In the category II Anti-TB Drugs, injections are administered to the patient every day for 56 days¹⁵. To motivate patients to complete treatment, a Drugs Supervisor/*Pengawas Minum Obat* (PMO) is involved. A PMO is someone who voluntarily helps TB patients in their treatment period until recovering. The PMO should be someone close to the patient (living in same house or close to the patient's house) so that supervision and treatment are more regular. Currently, the PMO is the patient's wife and they have been routinely visiting the *Puskesmas* to receive TB treatment.

The patient and families must be motivated to complete treatment. When the patient has a great motivation to recover and can work again then he is excited every day to come to health facilities, or *Puskesmas*, to get treatment. In addition to self-motivation, support from the wife is also needed to improve patient's compliance in taking medicine. During the refugee stay in the boarding house, the health workers in this case PPTI officers and TB program holders make household contact around the boarding house. The patient can take care of his child everyday while his wife works. With the refugee status, the government provides free medical treatment and staples for refugees. Health workers provide this information to the patient so they can complete the requirements to get the assistance.

Education about PHBS must be given to patients, families and the community¹⁶. In addition, it is important to explore to what extent the patient can work to get rid of these obstacles and then the doctors can discuss alternative solutions that can be implemented for the family.

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