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THE CHARACTERISTICS AND PROGNOSIS OF RELAPSED PATIENTS WITH PULMONARY TUBERCULOSIS

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ABSTRACT

Relapsed Pulmonary Tuberculosis is a condition of patients infected with *Mycobacterium tuberculosis* who have received complete OAT treatment and are declared cured but are re-infected. Based on WHO (World Health Organization) data in 2014, there were 7,840 cases of relapsed pulmonary tuberculosis in Indonesia. This study aims to determine the characteristics and prognosis of relapsed pulmonary tuberculosis patients at the Kramat Jati District Health Centre for the 2021-2022 period. This study uses medical record data with a retrospective descriptive method. In this study, data results were obtained on patients with Relapse Pulmonary Tuberculosis who were treated at the Kramat Jati District Health Center in the period 2021-2022, as many as 34 patients whose criteria met the inclusion criteria. The data obtained were data in the form of age, gender, type of pulmonary tuberculosis diagnosis, occupation or status, previous treatment history, anti-tuberculin drug guidelines, prognosis, which can be used as variables in this study. The data analysis used in this study is using descriptive statistical data methods with frequency analysis. The results showed that patients aged 21-40 years were (32.4%). Male gender (67.6%), bacteriological confirmed diagnosis type (94.1%). Type of employment or other status (58.8%), previous treatment history of relapse patients (61.8%), category 2 OAT guideline patients (82.4%). The prognosis of relapsed pulmonary tuberculosis patients tended to be good (27%). This study concludes that the prognosis of relapsed pulmonary tuberculosis patients with complete treatment category 2 tends to be good.

Keywords: oat category 2; prognosis; relapsed pulmonary tuberculosis

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INTRODUCTION

Tuberculosis is an infectious disease that attacks the lungs and other systemic organs. TB is caused by the bacteria *Mycobacterium tuberculosis* (*M. tuberculosis*) which can spread through the air when a sufferer coughs, sneezes or complains (Organization, 2020). Tuberculosis can be fatal if not treated immediately. Tuberculosis sufferers generally show symptoms such as: weight loss, fever, chills, coughing for more than two weeks, chest pain, shortness of breath, no or reduced appetite, fatigue, night sweats, phlegm mixed with blood. The examination carried out on tuberculosis patients is by examining BTA (Acid-Fast Bacillus) (Mar'iyah & Zulkarnain, 2021). Pulmonary tuberculosis is an infectious disease that affects the standard of living of humans throughout the world, with different incidence rates in each country. According to the WHO (World Health Organization) global tuberculosis report in 2020, an estimated 10 million people worldwide are suffering from TB. 5.6 million men, 3.3 million women, and 1.1 million children. TB is present in all countries and in all age groups. Tuberculosis is curable and preventable (Organization, 2024, 2025). Tuberculosis can be cured by giving OAT (Anti-Tuberculosis Drugs) for six to nine months (Afifa et al., 2024).

Patients who have recovered can be re-infected by bacteria *Mycobacterium tuberculosis* called Relapsed Pulmonary Tuberculosis or Recurrent Pulmonary Tuberculosis. Relapsed Pulmonary Tuberculosis can occur due to endogenous reactivation.

Relapsed Pulmonary Tuberculosis is a condition in which a Pulmonary Tuberculosis ²patient who previously received complete OAT treatment, has been declared cured and diagnosed as being re-infected with Tuberculosis with a positive AFB examination based on a smear or culture examination. Relapsed Pulmonary Tuberculosis can occur due to factors that influence the occurrence of relapse (Jaya & Mediarti, 2017). The patient is re-infected and the number of bacilli causing the infection in the patient must be sufficient, with 10-99 AFB found in 100 fields of view called positive one (1+). The bacillus has a high virulence from the Tuberculosis bacillus, decreased body resistance also allows the bacillus to reproduce well and relapse can occur again. Symptoms that arise in patients with relapsed pulmonary tuberculosis tend to be the same as primary pulmonary tuberculosis, such as shortness of breath, coughing up phlegm and coughing up blood. Patients with relapsed pulmonary tuberculosis also experience productive cough and the most dominant symptom in patients with relapsed pulmonary tuberculosis is shortness of breath. Shortness of breath in tuberculosis patients is caused by restrictive defects in pulmonary ventilation function and disruption of the gas exchange process. Extensive fibrosis and stiffness of the lung parenchyma in patients with pulmonary tuberculosis cause patients to have difficulty breathing. Patients with relapsed pulmonary tuberculosis also experience destruction of the elastic muscular components of the bronchi, causing bronchiectasis and airway obstruction, so that patients feel short of breath (Widyastuti et al., 2019).

Supporting examinations to confirm the diagnosis of patients with relapsed pulmonary tuberculosis are the same as those for patients with primary pulmonary tuberculosis, by conducting Acid-Fast Bacilli (AFB) examinations and chest X-ray examinations of patients with relapsed pulmonary tuberculosis (Dewi, 2019). TB recurrence rates vary due to differences in epidemiology³ and risk factors, ranging from 4.9 to 47 per 100,000 population in 2017. A study conducted in Vietnam showed that 21 out of 244 (8.6%) patients experienced disease recurrence 1-2 years after successful treatment. A study in southern Ethiopia reported that 15 out of 368 (4.1%) smear-positive TB patients experienced disease recurrence after successful treatment. Another study conducted in England and Wales reported a recurrence rate of 4.1 in 1,000 person-years (Moosazadeh et al., 2015). Based on WHO (World Health Organization) data, in 2014, there were 7,840 cases of recurrent Pulmonary TB in Indonesia, with 6,449 cases confirmed bacteriologically and 1,391 cases diagnosed clinically. In 2022, the number of cases of recurrent Pulmonary TB in Indonesia was 12,531 patients (Naomi et al., 2016). The relatively long TB treatment period of 6-8 months is the cause of TB patients having difficulty recovering because TB patients stop taking treatment after feeling healthy, even though the treatment process has not been completed. The TB problem is exacerbated by the increase in Human Immunodeficiency Virus/Acquired Human Immunodeficiency Syndrome (HIV/AIDS) infections, which are developing rapidly, and the emergence of Multi-Drug Resistant (MDR) problems. Another problem is the presence of latent TB sufferers, patients² who are not sick, but due to decreased immunity, TB disease will appear (Syakti, 2014). The purpose of this study was to determine the characteristics and prognosis of Relapse Pulmonary Tuberculosis patients at the Kramat Jati District Health Center for the period 2021-2022 (Handayani et al., 2022). The purpose of this study was to determine the characteristics and prognosis of Relapse Pulmonary Tuberculosis patients at the Kramat Jati District Health Center for the period 2021-2022.

METHOD

Descriptive research with a retrospective approach. The data was obtained by taking medical record data of relapse pulmonary tuberculosis patients for the period 2021-2022. The analysis was continued to examine the characteristics and prognosis of relapse pulmonary tuberculosis patients at the Kramat Jati District Health Center. The population in this study was the status card of relapse pulmonary tuberculosis patients who came to the Kramat Jati District Health Center for the period 2021-2022. The sample used in this study used the total sampling technique, and the criteria for the number of medical record data were the same as the number of samples to be used for the study, that met the inclusion and exclusion criteria, namely 34 patient data. This research instrument uses secondary data in the form of medical records of patients with relapsed pulmonary tuberculosis infection in patients at the Kramat Jati District Health Center in the 2021-2022 period. The data analysis used in this study is using descriptive statistical data methods with frequency analysis

RESULT

Table 1 indicates data on participant characteristics based on gender and age. Where for gender is dominated by men as many as 23 out of 34 participants (67.6%); for age is dominated by the 21-30 age group as many as 11 out of 34 participants (32.4%) and the 31-40 age group as many as 11 out of 34 participants (32.4%)

Table 1.

Frequency Distribution of Respondents Based on Gender and Age

Characteristic	f	%
Gender		
Male	23	67.6
Female	11	32.4
Age		
11-20 year	2	5.9
21-30 year	11	32.4
31-40 year	11	32.4
41-50 year	5	14.7
51-60 year	3	8.8
>60 year	2	5.7

Based on age groups, in the 2021-2022 period at the Kramat Jati District Health Center, East Jakarta, it was found that the most sufferers of Relapse Pulmonary Tuberculosis occurred at the age of 21-30 years and 31-40 years, each with 11 people (32.4%), followed by the age range of 41-50 years with 5 people (14.7%), the third position was in the age range of 51-60 with 3 people (8.8%), the population of relapse pulmonary tuberculosis patients with the smallest number was in the age range of 11-20 years and >60 years with 2 people each (5.9%).

Table 2.

Characteristics of Relapsed Pulmonary Tuberculosis Patients Based on Type of Diagnosis and Previous Treatment History

Characteristic	f	%
Type of Diagnosis		
Bacteriologically confirmed patient	32	94.1
Patients Clinically Diagnosed	2	5.9
Previous Treatment History		
Relapsed Patient	21	61.8
Patients who were re-treated after failure	4	11.8
Patients who were readmitted after stopping the drug	9	26.5

Table 3 shows the data on the Characteristics of Relapsed Pulmonary Tuberculosis Patients based on the Anti-Tuberculin Drug Guidelines

8 Table 3.
Characteristics of Relapsed Pulmonary Tuberculosis Patients Based on Anti-Tuberculin Drug Guidelines

Characteristic	F	%
Category 1	6	17.6
Category 2	28	82.4

8 Table 4.
Characteristics of Relapsed Pulmonary Tuberculosis Patients Based on Prognosis

Characteristic	f	%
Healed	6	17.6
Complete Treatment	27	79.4
Failed	1	3.0

DISCUSSION

Based on the information in Table 1, it can be seen that the number of patients with pulmonary tuberculosis who experienced a relapse and received treatment at the Kramat Jati District Health Center, East Jakarta, was dominated by men with a total of 23 people (67.6%), while the number of women who experienced a similar condition was 11 people (32.4%). The results of this study are comparable to research conducted by Fajriah Saraswati, Zulfitrani Murfat, Rasfayannah, et al. in 2022, it was found that patients with relapsed pulmonary tuberculosis at the Ibnu Sina Hospital, Makassar, were 37 people (58.7%) from a total sample of 63 male people. In terms of quantity, more men suffered from relapsed pulmonary tuberculosis compared to women. Based on research conducted by Iwan Samsugito and Hambyah in 2018, it was stated that men and women have the same chance of suffering from relapsed pulmonary tuberculosis and gender is not a risk factor for relapsed pulmonary tuberculosis (Burhan, 2020). Based on these data, the high incidence of relapsed pulmonary tuberculosis in men can occur because men have the habit of smoking, drinking alcohol, using illegal drugs and high interaction and activities outside which increase the incidence of relapse in pulmonary tuberculosis patients (Saraswati et al., 2022). The results of this study show results that are in line with the research conducted by Nadya Safira, Yani Triyani and Dadang Rukanta in 2018-2019, which found that the highest number of pulmonary tuberculosis sufferers were in the productive age group of 15-55 years, namely 99 people out of 146 existing samples (39.1%) (Safira et al., 2022). This can be caused by the increasing number of cases of pulmonary tuberculosis in the productive age group due to activities that are often carried out outside the workplace, facilitating the transmission of the disease. This condition occurs because work often requires being outdoors, thus increasing the risk of exposure pulmonary tuberculosis, which can spread through droplets in the open air without being unknowingly inhaled by at-risk individuals (Samsugito, 2018).

4 Based on Table 2 Types of diagnosis performed on patients with relapsed pulmonary tuberculosis at the Kramat Jati District Health Center for the 2021-2022 period, the most were relapsed pulmonary tuberculosis patients with a bacteriologically confirmed diagnosis type of 32 people (94.1%), while patients with a clinically diagnosed diagnosis type were 2 people (5.9%). This study shows that bacteriologically confirmed TB patients are more dominant. A bacteriologically confirmed diagnosis is a patient who is proven to be bacteriologically positive on direct microscopic examination results such as TCM TB or culture (Burhan, 2020). Included in this group are patients: Positive BTA patients, Positive M.TB culture patients, Patients with positive M.TB rapid test results. Patients diagnosed clinically are patients who do not meet the criteria for bacteriological diagnosis but are diagnosed as active relapse pulmonary TB by a doctor, and it is decided to be given category 2 pulmonary TB treatment. Included in this group are patients: BTA-negative pulmonary TB patients with

chest X-ray results supporting TB, BTA-negative pulmonary TB patients with no clinical improvement after being given non-OAT antibiotics, and have risk factors for relapse TB, extrapulmonary TB patients diagnosed clinically or by laboratory and histopathological results without bacteriological confirmation (Burhan, 2020)

Bacteriological examination is the gold standard to confirm the presence of *Mycobacterium Tuberculosis* infection (Pomandia et al., 2017). so that in this study it can be seen that bacteriological confirmation is the most compared to clinically diagnosed patients. Patients who are clinically diagnosed with TB and positive bacteriological test results should be reclassified as bacteriologically confirmed TB patients. In an effort to avoid over-diagnosis and potential harm to patients, TB treatment should only be given based on clinical diagnosis in certain situations, such as: complaints, symptoms, and clinical conditions of the patient strongly support a diagnosis of TB, the patient's condition requires immediate treatment, such as in cases of TB meningitis, miliary TB, HIV-positive patients, TB pericarditis, and adrenal TB (Burhan, 2020). This study shows that there is a conformity in the flow of establishing the diagnosis of relapsed pulmonary tuberculosis at the Kramat Jati District Health Center. The conformity in establishing this diagnosis greatly influences the provision of medical and therapeutic actions for patients which of course has an impact on the level of recovery and life expectancy of patients.

Based on the Previous Treatment History of patients with relapsed pulmonary tuberculosis at the Kramat Jati District Health Center for the 2021-2022 period, the most were relapsed pulmonary tuberculosis patients with a Previous Treatment History of relapsed patients as many as 21 people (61.8%), followed by patients who were re-treated after stopping treatment 9 people (26.5%), then patients who were re-treated after failing as many as 4 people (11.8%). This study shows that category 2 pulmonary tuberculosis patients who come to the Kramat Jati District Health Center were mostly relapse patients, patients who had been declared cured or had completed treatment and were re-infected with pulmonary tuberculosis through bacteriological or clinical examinations.¹² Furthermore, patients who were re-treated after stopping treatment were patients who had been treated and were no longer followed up, or patients who had stopped treatment <3-9 months who were symptomatic again. The next classification is patients who are re-treated after failure are tuberculosis patients who have been treated and declared to have failed treatment. Included in this classification are OAT-resistant tuberculosis patients. (Ratnawati & Arifin, 2022). The medical record data obtained from this study are in accordance with the classification of pulmonary tuberculosis category 2 based on previous treatment history by the Indonesian Ministry of Health (Shofa & Ismail, 2014). Research conducted by Alfrianti Y. in a 2022 narrative review study on recurrent pulmonary tuberculosis stated that failure to achieve bacteriological healing, which is often caused by irregularities in taking medication, is a major factor that causes disease recurrence. Risk factors for the recurrence of TB infection include inadequate treatment regimens, non-adherence to treatment, and unknown drug resistance. Treatment regimens that have low bactericidal potential, inadequate duration of treatment, inappropriate drug selection, and inability to detect drug resistance all contribute to treatment failure and recurrence of tuberculosis.

Based on Table 3 of the Anti-Tubercular Drug Guidelines for patients with relapsed pulmonary tuberculosis at the Kramat Jati District Health Center for the 2021-2022 Period, the majority were relapsed pulmonary tuberculosis patients with OAT category 2 guidelines, as many as 28 people (82.4%), while for category 1 treatment there were 6 people (17.6%). In terms of patient categories, some of the research subjects were patients receiving category 2 treatment, as many as 28 people (82.4%) and category 1, as many as 6 people (17.6%).

Patients in category 1 refer to individuals suffering from tuberculosis (TB) in the lungs or extrapulmonary, with positive or negative BTA (Acid-fast Bacillus Tuberculosis) examination results, as well as positive or negative radiographic results. In category 2 patients, it includes cases of relapse, drug withdrawal (default), and treatment failure. This study shows the suitability of the OAT combination for the treatment category, based on data analysis obtained from patients receiving OAT category 2 treatment of 82.4%, there were 6 people with relapsed pulmonary tuberculosis who received OAT not in accordance with OAT guidelines and were still using category 1 treatment. The inappropriate treatment in these 6 people was not stated in the medical record data. What could happen in this inappropriate treatment is a complication factor with comorbid diseases suffered by the patient so that some drug combinations cannot be given (Rahmi & Roslina, 2021)

In category 1 treatment in the intensive phase, RHZE combination therapy (Rifampicin, Isoniazid, Pyrazinamide, Ethambutol) or 4KDT (fixed dose combination) is given daily for 56 days. The next step is the continuation phase which consists of RH therapy (rifampicin, isoniazid) or 2KDT (fixed dose combination) given 3 times a week for 16 weeks or 4 months. (Tumiwa et al., 2023). In category 2 in the intensive phase, the therapy given is RHZES (Rifampicin, Isoniazid, Pyrazinamide, Ethambutol, Streptomycin Injection) or 4KDT (fixed dose combination) plus Streptomycin Injection for 56 days, followed by RHZE or 4KDT for 28 days. In the continuation phase, the therapy given is RHE (Rifampicin, Isoniazid, Ethambutol) or 4KDT plus E (Ethambutol) for 20 weeks or 4 months. The insertion phase is prepared for patients who do not experience AFB conversion after intensive treatment, by giving RHZE (Rifampicin, Isoniazid, Pyrazinamide, Ethambutol) every day for 28 days (Siallagan et al., 2023).

Based on Table 4 Prognosis of patients with relapsed pulmonary tuberculosis at the Kramat Jati District Health Center for the 2021-2022 period, the most were relapsed pulmonary tuberculosis patients with a complete treatment prognosis (tending to be good) as many as 27 people (79.4%), followed by relapsed pulmonary tuberculosis patients with a prognosis of recovery 6 people (17.6%), the next prognosis failed treatment as many as 1 person (2.9%). This study shows a good prognosis, based on the National Guidelines for the Management of Pulmonary Tuberculosis of the Indonesian Ministry of Health 2020 in patients with OAT category 2, if the results of the BTA examination are still positive at the end of the intensive phase, then a TCM examination, culture, and sensitivity test will be carried out. If the sputum BTA is still positive at the end of the fifth month and the end of treatment (eighth month), then the treatment is considered a failure, and a TCM examination, culture, and sensitivity test will be carried out. Determination of treatment results is based on the results of the examination carried out at the end of treatment. The definition of Pulmonary Tuberculosis treatment results based on the Indonesian Ministry of Health 2020 has several classifications, including: cured, complete treatment (tending to be good), treatment failed (Burhan, 2020).

This study is in line with research conducted by Yorien Setia Alfrianti in the Indonesian Multidisciplinary Journal 2022, stating that the prognosis in patients with recurrent infections undergoing therapy is generally good in most cases. Previous studies reported that 76.4% and 76.35% of patients with recurrent pulmonary tuberculosis managed to achieve positive results (cured or completed treatment) after undergoing therapy. 27 5 This study reported that the results of treatment in relapse cases tended to be good. Based on research conducted by Aulia Rahmi and Ance Roslina in the Simantek Scientific Journal 2021, the factors that influence the success of treatment in patients with relapsed pulmonary tuberculosis are the level of education and patient compliance in taking medication. The level of education greatly influences the patient's knowledge in receiving information about the disease. 20 Compliance

with taking medication affects recovery because it affects the patient's nutritional status and improves the condition of infection, thus affecting the patient's recovery (Rahmi & Roslina, 2021; Tumiwa et al., 2023). Family support is also one of the factors in achieving successful treatment because emotional support, motivation, and enthusiasm provided by the family convince the patient that they can recover if they are obedient in taking medication. This family support causes tuberculosis sufferers to want to fight for a more meaningful life. The success of the treatment achieved can affect the patient's recovery rate.

CONCLUSION

Relapsed pulmonary tuberculosis is a significant challenge in the TB elimination efforts in Indonesia. Based on the results of a study at the Kramat Jati District Health Center in 2021–2022, the majority of relapsed TB patients were productive-age men with a history of previous TB treatment. The type of diagnosis was generally bacteriologically confirmed, and most underwent category 2 therapy. The prognosis for most patients is good if the treatment is carried out completely and correctly.

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