

Profile of Pulmonary Tuberculosis Patients in Dr. Soetomo General Academic Hospital

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ABSTRACT

Tuberculosis (TB) is a disease caused by *Mycobacterium tuberculosis*, which mainly attacks the lungs but can also infect other body organs. Tuberculosis is a global health problem that causes the highest death after Human Immunodeficiency Virus (HIV). Indonesia ranks third highest in the world, with 420,994 cases in 2017. This study aims to determine the profile of pulmonary tuberculosis patients at Dr. Soetomo General Academic Hospital, Surabaya from January 1st to December 31st, 2019. The research was conducted using a descriptive method by collecting secondary data, through medical records of pulmonary tuberculosis patients at the Inpatient Unit of Dr. Soetomo General Academic Hospital during January 1st- December 31st, 2019. The data obtained were processed according to gender, age, education, occupation, comorbidities, clinical symptoms, history of TB treatment, sputum examination results, and GeneXpert. This study uses total sampling presented in the form of pictures. The results showed that most of the patients were male (61.92%), aged 45-54 years old (25.13%), high school education level (56.48%), and private employees (34.45%). The most common comorbidities were diabetes mellitus (35.07%), the most clinical symptoms found were shortness of breath (29.56%), the complete history of TB treatment was first-line OAT (42.22%), as many as (77.97%) sputum examinations showed no data. Many (7.77%) GeneXpert results showed resistance to rifampicin after six months of therapy.

Keywords: Tuberculosis, lung disease, Dr. Soetomo General Academic Hospital

INTRODUCTION

Tuberculosis (TB) is a disease caused by bacteria (*Mycobacterium tuberculosis*), which mainly attacks the lungs but can also infect other body organs.¹ According to WHO, TB is currently a global health problem that can cause the highest death following Human Immunodeficiency Virus (HIV). According to a report by the World Health Organization (2020), it is stated that every year there are around 10 million people affected by tuberculosis, and 1.5 million people die from being infected with tuberculosis. According to the Ministry of Health (2018), the number of cases in Indonesia reached 420.994 cases in 2017.²

Multidrug-Resistant (MDR) TB are TB patients resistant to concomitant drugs such as Isoniazid and Rifampicin. While waiting for examination results, the patient may receive inappropriate medication, thereby increasing the chance of developing MDR TB.³

GeneXpert examination is one of the molecular tests that include all reaction elements and reagents needed for the PCR process in only one cartridge.⁴ In

the use of GeneXpert, can identify the presence of MTB bacteria and resistance to drugs such as stimulant rifampicin so that early initiation of accurate therapy can support the implementation of control of the MDR TB program can be applied and can also reduce cases of pulmonary TB.⁵ Therefore, this study aims to determine the profile of pulmonary tuberculosis patients at Dr. Soetomo General Academic Hospital.

METHODS

This study is a descriptive study by collecting various data on age, gender, education, occupation, comorbidities, clinical symptoms, TB treatment history, and results of laboratory examinations including GeneXpert and AFB (acid fast bacilli) sputum at Dr. Soetomo General Academic Hospital throughout January 1st - December 31st, 2019 with a retrospective approach, based on secondary data through medical records of pulmonary TB patients. This research received permission from the Health Research Ethics Committee of Dr. Soetomo General Academic Hospital, Surabaya with a letter of exemption number 0672/LOE/301.4.2/X/2021.

The inclusion criteria in this study were pulmonary TB patients diagnosed clinically and in the laboratory at the Dr. Soetomo General Academic Hospital during the January 1st - December 31st, 2019 period. The sampling technique used in this study was total sampling from medical records at Dr. Soetomo General Academic Hospital.

The research instruments used were according to the variable components, including age, sex, education, occupation, clinical symptoms, comorbidities, TB treatment history, and results of laboratory tests (GeneXpert and BTA sputum).

Data collected from medical records will later be analyzed using descriptive methods, namely by describing existing data and grouping data based on variables and type of analysis, then data results will be presented using pictures and percentages, and comparisons between groups will be carried out to show the results of the study.

RESULTS AND DISCUSSIONS

A retrospective study on the profile of pulmonary tuberculosis patients in Dr. Soetomo General Academic Hospital has been done by evaluating the patient's medical records. The prevalence of pulmonary tuberculosis patients was 386 patients. The data included gender, age, education, occupation, comorbidities, clinical symptoms, history of TB treatment, and results of laboratory tests such as GeneXpert and Acid Fast Bacilli (AFB) sputum. At the end of the study, 386 patients had pulmonary tuberculosis. The results of this study will be presented in the form of images and percentages.

Based on Figure 1, most pulmonary tuberculosis patients in the Inpatient Unit of Dr. Soetomo General Academic Hospital for January 1st - December 31st, 2019, were male, namely 239 patients with a percentage of 61.92%, while the female was 147 (38.08%). The results of this study were similar to previous studies, which stated that the prevalence of

pulmonary tuberculosis patients was predominantly male.^{6,7} Pulmonary TB is more common in male patients compared to females because most males have the habit of smoking making them more susceptible to pulmonary TB. Smoking patients are more vulnerable to infection than non-smokers. Based on this theory, the number of the male is three times higher than the female.⁸

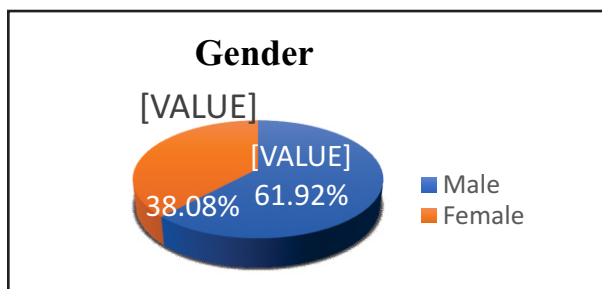


Figure 1. Gender of pulmonary tuberculosis patients

Based on Figure 2, the largest age group distribution of pulmonary tuberculosis patients was the early elderly (45-54 years old) with 97 patients (25.13%). The results of this study follow the statement of the Ministry of Health, which states that the early elderly age group (45-54 years old) is the largest age group of pulmonary TB patients. This is presumably because the early elderly group has activities that are more often in contact with the community, increasing the exposure to *Mycobacterium tuberculosis*.⁹

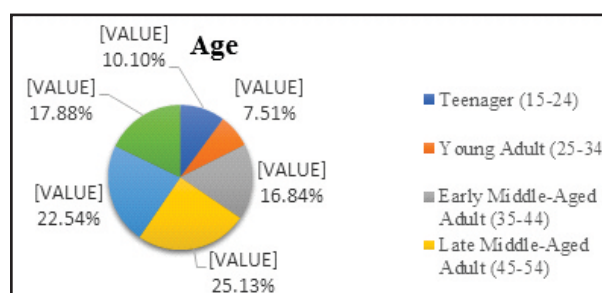


Figure 2. Age in pulmonary tuberculosis patients

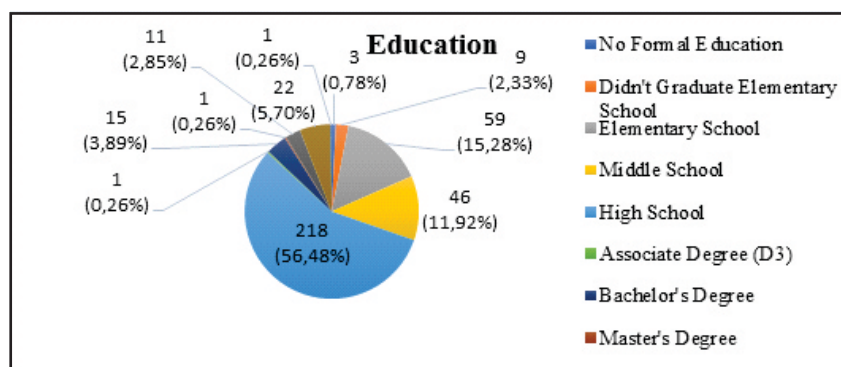


Figure 3. Education in pulmonary tuberculosis patients

Based on Figure 3, the level of education for most pulmonary tuberculosis patients was high school graduates with 218 patients (56.48%). The results of this study are in line with previous studies, which stated patients mostly graduated from Senior High School (SHS).¹⁰ Low education in patients affects the patient's understanding of the disease. It can affect patient compliance in taking drugs that should be taken for six months to 3 months.¹¹

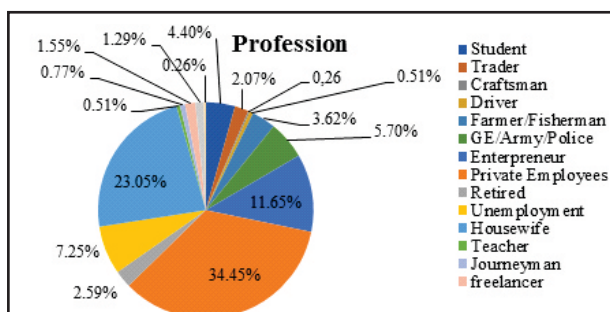


Figure 4. Profession in pulmonary tuberculosis patients

Based on Figure 4, the results showed that pulmonary tuberculosis patients were mostly private employees, namely 133 patients (34.45%). This is supported by previous research, which stated that most of the occupations were private employees.¹² It could be caused by the fact that most patients live in urban areas, with the main occupation being private sector workers.¹³

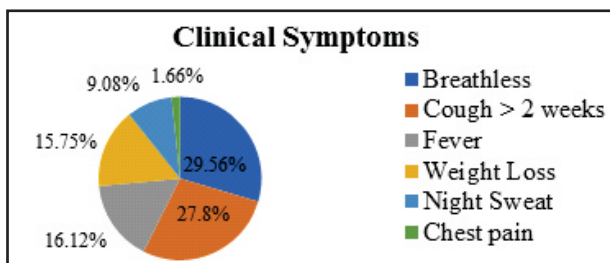


Figure 5. clinical symptoms in pulmonary tuberculosis patients

Based on Figure 5, clinical symptoms in pulmonary tuberculosis patients most suffered from shortness of breath as many as 319 patients (29.56%). The results of this study are in line with previous studies, which stated that the most clinical symptom of pulmonary TB was shortness of breath.⁹ If the infection occurs in patients with tuberculosis in the lungs and has caused lung damage, symptoms of shortness of breath will occur.¹⁴

Based on Figure 6, most of the pulmonary tuberculosis patients did not have comorbidities, which were 170 patients (38.72%). This follows the results of previous research by Bakhtiar *et al.*¹⁵ The

most comorbidity found in pulmonary TB patients were diabetes mellitus, with as many as 154 patients (35.07%). This follows a study by Septiawan *et al.*, which stated that diabetes mellitus was the most found comorbidity in pulmonary TB patients.

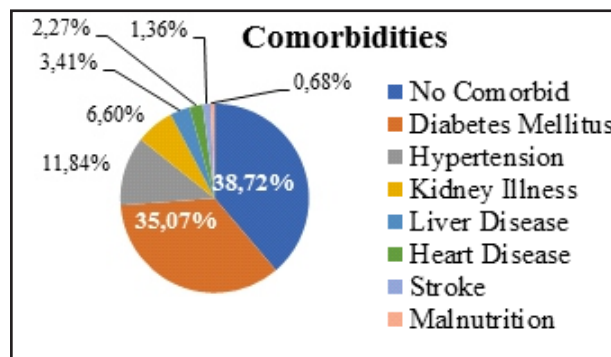


Figure 6. Comorbidities in pulmonary tuberculosis patients

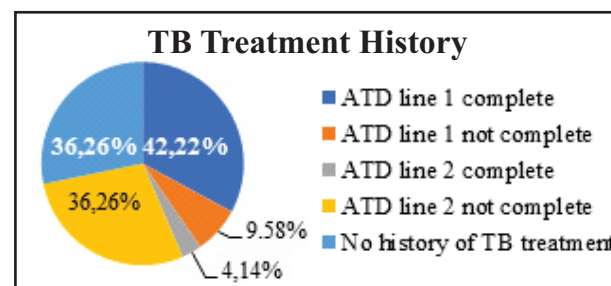


Figure 7. History of TB treatment in pulmonary tuberculosis patients

Based on Figure 7, TB treatment history, it was found that pulmonary tuberculosis patients with a history of TB treatment mostly completed first-line OATs, namely HRZE (Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), Ethambutol (E) with a total of 163 patients (42.22 %). This follows previous research, which stated that the most TB treatment history was HRZE.^{16,17} Treatment of pulmonary tuberculosis takes quite a long time compared to other bacterial infections, if TB treatment is not completed, drug resistance will occur, so it is essential to hold counseling for TB patients to complete the stages of TB treatment.¹⁸

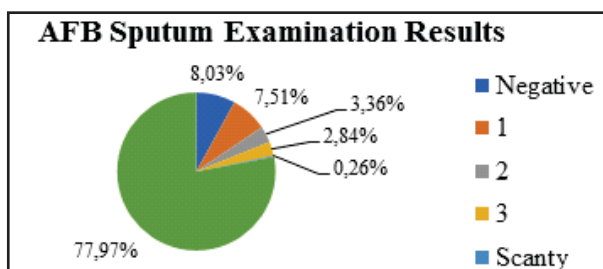


Figure 8. Results of AFB sputum examination in pulmonary tuberculosis patients

Based on Figure 8, 301 patients (77.97%) did not have results of the AFB sputum examination. Patients who do not have data on the results of AFB sputum examination have several reasons, namely due to factors that doctors may forget to attach information data to medical records, form designs that do not pay attention to aspects of content, anatomy, and various types of forms for one inpatient patient, as well as from patients who previously there was a plan to do a sputum smear test, but his life was not saved.¹⁹ The BTA sputum test is considered less specific for diagnosing TB. This follows a study conducted by Shirata *et al.*, which states that non-tuberculosis mycobacteria colonization also often has positive sputum smear results, which can cause doctors to prescribe unnecessary antituberculosis drugs for patients.

According to the Ministry of Health, an AFB sputum examination should not be carried out to establish a diagnosis of pulmonary TB if a molecular exam has been carried out, or in other words, an AFB sputum examination can be performed to confirm a diagnosis if a molecular test cannot or has not been carried out. Therefore, the sputum smear examination data in this study were only used for monitoring by the researcher.²⁰

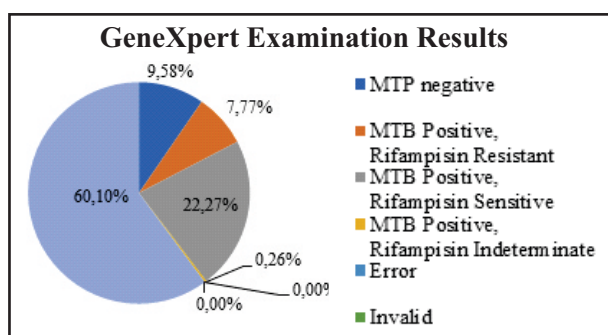


Figure 9. GeneXpert examination results in pulmonary tuberculosis patients

Based on Figure 9, shows the GeneXpert examination results in rifampicin-resistant pulmonary tuberculosis patients against MTB bacteria after six months of therapy was 30 patients (7.77%). This result is equivalent to a study stating that most GeneXpert examination results in Ethiopia (9.9%) were resistant to rifampin.²¹ Second-line OAT treatment is needed for a more effective treatment regimen. Patients whose MTB results were Rifampicin sensitive were still sensitive to first-line OAT, while a positive MTB result is seen if Rifampicin is intermediate. Undetectable MTB or negative MTB can be described as MTB not found in the TCM process.⁵ Drug-resistant TB is a consequence of

human error due to poor adherence and quality of ineffective OAT.²²

CONCLUSIONS AND SUGGESTIONS

Based on the results it was concluded that the gender of most patients was male as many as 239 patients (61.92%), most patients were from the early elderly (45-54) age group, as many as 97 patients (25.13%), most patient education were high school graduates as many as 218 patients (56.48%), and the occupation of most of the patients was from the private sector as much as 133 patients (34.45%). Shortness of breath was the most common clinical symptom found in 319 patients (29.56%), diabetes mellitus was the most common comorbidity found in 154 patients (35.07%), and most history of TB treatment was complete first-line OAT in 163 patients (42.22%). There were mostly no data on AFB sputum examination for as many as 301 patients (77.97%), and there were 30 patients (7.77%) with Rifampicin-resistant GeneXpert results.

Based on this retrospective research, the researchers suggest an improvement in hospital services for pulmonary tuberculosis patients in the Inpatient Unit of Dr. Soetomo General Academic Hospital, by completing detailed medical record data.

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