Characteristics of Pulmonary Tuberculosis Patients in RSUD Prof. DR. W. Z. Johannes Kupang

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ABSTRACT

Background: Tuberculosis is an infectious disease caused by the bacteria Mycobacterium tuberculosis and contributes to one of the top 10 causes of death in the world. Tuberculosis sufferers in Indonesia are ranked as the 2nd most in the world. **Objective:** Tuberculosis cases in the province of East Nusa Tenggara continue to increase from year to year, especially in the Kupang city. Data of inpatient pulmonary tuberculosis patients in RSUD Prof. Hospital DR. W.Z. Johannes Kupang from 2017 to 2018 increased with 238 cases to 275 cases. **Methods:** This study aims to determine the characteristics of pulmonary tuberculosis patients hospitalized in RSUD Prof. DR. W.Z. Johannes Kupang. This research was conducted using the descriptive observational methods. Data collected using medical records with purposive sampling obtained a sample size of 51. **Results and Conclusion:** The majority of pulmonary tuberculosis patients hospitalized in RSUD Prof. DR. W.Z. Johannes Kupang consist of 60.8% of the male sex, 35.3% of the 45-55 year age group, 35.3% of primary school education status, and 54.9% of AFB smear-positive sputum.

Keywords: Characteristics, Pulmonary Tuberculosis, RSUD Johannes Kupang

BACKGROUND

Tuberculosis is an infectious disease caused by the bacteria *Mycobacterium tuberculosis* (*M. tuberculosis*) and contributes to one of the top 10 causes of death[1]. In 2017, tuberculosis caused around 1.3 million deaths in tuberculosis patients with HIV negative status and around 300,000 deaths in tuberculosis patients with HIV[2]. The incidence of tuberculosis in Indonesia is ranked as the 2nd most in the world[3]. Elimination of tuberculosis is one of the three main focuses of the government in the health sector in Indonesia[4]. In 2017, 32 provinces were experiencing an increase in the tuberculosis Case Notification Rate (CNR) in Indonesia and one of them, East Nusa Tenggara, was also included to be one of the provinces that have not yet reached the minimum tuberculosis rate of 90 percent[5]. Kupang City is the area with the highest CNR level in the province of East Nusa Tenggara with 211 cases per 100,000 population[6]. Tuberculosis patients in hospitals usually have a complete medical record. These patients often show severe symptoms and have high risk of morbidity and mortality. Data of inpatient pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang from 2017 to 2018 increased from 238 cases to 275 cases. The high number of patients with pulmonary tuberculosis in Indonesia and the increasing CNR number of tuberculosis in the province of East Nusa Tenggara, especially in Kupang City coupled with the high risk of morbidity and mortality of hospitalized tuberculosis patients encouraged the authors to research about the characteristics of hospitalized tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang.

LITERATURE

Tuberculosis is an infectious disease caused by the bacteria *M. tuberculosis*. Common symptoms that occur in patients with tuberculosis include prolonged cough, chest pain, fatigue, weight loss, fever, and cold sweat[7]. Transmission of *M. tuberculosis* is through airborne route. Transmission occurs when a person inhales droplet nuclei containing *M. tuberculosis*[8]. Tuberculosis can affect anyone, especially in people who have the high-risk factors for tuberculosis[9]. Factors that can affect a person's risk of being more susceptible to tuberculosis are factors from exposure of *M. tuberculosis*, individual factors, and environmental factors. Exposure of bacteria that cause tuberculosis is associated

with tuberculosis patients with positive smear who have a great risk of infecting the surrounding environment, the number of bacteria in sputum, and the length of time exposed to the bacteria. Individual characteristic factors also have a large role in the risk of tuberculosis, including age, sex, endurance, behavior, and socioeconomic status. Other factors that influence the risk of developing tuberculosis are environmental factors, namely a dense environment and lack of air circulation and sunlight can increase susceptibility to tuberculosis. In the individual characteristic factor regarding age, more productive age groups were found to be affected by tuberculosis, and based on survey results, the prevalence of tuberculosis in male sex was higher than in women, and more were attacked in lower socioeconomic groups. Behavioral factors that are related to tuberculosis include coughing tuberculosis patients who do not follow cough ethics, thereby increasing the risk of transmission to people around and smoking. Endurance is associated with immunosuppression and poor nutritional status can increase the risk of tuberculosis[10]. The results of research at RSUD Sibuhuan, Padang Lawas District, showed that the nutritional status was less than 3.31 times greater than the people with good nutritional status[11]. Socioeconomic status has a relationship with a person's educational status which will affect knowledge about health and based on the results of previous studies at RSUD dr. Soedarso found that the majority of patient education levels were 32.2% with only primary school level[12].

RESEARCH METHODS

The study was conducted in RSUD Prof. DR. W.Z. Johannes Kupang uses a descriptive observational method. The study design was a cross-sectional approach and data were collected using secondary data from medical records. Ethical clearance from the medical research ethics committee of the Faculty of Medicine, University of Ciputra No, 043 / EC / KEPK-FKUC / VII / 2019.

The population in this study was pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang. The study sample was 2018 inpatient pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang. The sampling technique was done by purposive sampling, which used samples that met the inclusion criteria. The sample size was 51 samples who met the following inclusion criteria: patients who have data on medical record number, name, gender, age, education status, nutritional status, and examination AFB sputum. The exclusion criteria were if the medical records were not complete. Data were processed and analyzed using frequency distribution tables.

Formula of sample calculation:

$$n = \frac{N \cdot za^2 \cdot p \cdot q}{d^2 \cdot N - 1 + Za^2 \cdot p \cdot q}$$

n = sample size N
= population
Za = standard spread value, according to a value = 1.96
p = case proportion in population
d = deviation value (absolute that can be accepted = 0.1
q= 1-p = proportion to an incidence

$$n = \frac{50 \cdot (1.96)^2 \cdot 0.85 \cdot 0.15}{(0.1)^2 \cdot (50 - 49) + (1.96)^2 \cdot 0.85 \cdot 0.15}$$

n = 49.7 = 50 (minimum sample)

RESULTS

The results of inpatient pulmonary tuberculosis patient data collection in 2018 in RSUD Prof. DR. W.Z. Johannes Kupang consisted of 275 patients and the number included based on the inclusion criteria was 51 patients.

Table 1. Frequency distribution of subjects by gender

Gender	Frequency (n)	Percentage (%)
Male	31	60.8
Female	20	39.2
Total	51	100

The majority of inpatient pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang are male, as many as 31 patients (60.8%).

Table 2. Distribution of subject frequencies by age

Age (year)	Frequency (n)	Percentage (%)
Late teens (17-25)	7	13.7
Early adulthood (26-35)	8	15.7
Late adulthood (36-45)	12	23.5
Early elderly (46-55)	18	35.3
Late elderly (56-65)	6	11.8
Total	51	100

A large group of inpatient pulmonary tuberculosis patients in RSUD Prof. Hospital DR. W.Z. Johannes Kupang were in the age category of 46-55 years as many as 18 patients (35.3%).

Table 3. Subject frequency distribution based on education status

Education Status	Frequency (n)	Percentage (%)
Primary	18	35.3
Secondary	14	27.5
High School	17	33.3
University	2	3.9
Total	51	100

The highest education status of pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang was an elementary school level of 18 patients (35.3%).

Table 4. Subject frequency distribution based on nutrition status

Nutrition Status	Frequency (n)	Percentage%
BMI <18.5	33	64.7
BMI 18.5-22.9	13	25.5
BMI > 22.9	5	9.8
Total	51	100

The majority of inpatient pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang has a poor nutritional status with a body mass index (BMI) of less than 18.5 of 18 patients (35.3%).

Table 5. Subject frequency distribution based on results AFB smear

AFB	Frequency	Percentage %
Negative	23	45.1
Positive	28	54.9
Total	51	100

The majority of pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang has AFB smear- positive sputum, which were as many as 23 people (45.1%).

DISCUSSION

The majority of inpatient pulmonary tuberculosis patients at RSUD Prof. DR. W.Z. Johannes Kupang are male, as many as 31 patients (60.8%). This finding is in line with research in Tuminting Community Health Center with the highest number of patients being male with 55.1%[13]. According to research of Dotulong et al.[14] which statesthat more men are infected with pulmonary tuberculosis because it is associated with activities that can reduce the body's immunity, such as smoking and drinking alcohol. Following WHO data in 2018 with around 10 million people experiencing tuberculosis, 5.7 million of them were men[1].

A large group of inpatient pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang were in the age category of 46-55 years as many as 18 patients (35.3%). The results of this study are in line with research conducted by Muchtar at RSUP Dr. M. Djamil Padang in 2015 with the largest number of pulmonary tuberculosis patients aged over 45 years by 44.6% and many occur in this age group because by then the body's immune system has begun to decrease[15].

The highest education status was inpatient pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang was an elementary school level of 18 patients (35.3%). The results of this study are in line with research in Seberang Ulu 1 Public Health Center in Palembang where the most characteristics of tuberculosis patients being primary school level graduates with 74.7%[16]. Educational status is an important factor related to knowledge abouta disease and influences a person's behavior in seeking treatment[17]. Low education level is one of the risk factors for tuberculosis because of the low level of awarenessof tuberculosis[18]. Education status can affect a person's behavior in a healthy life, i.e. someone with low education tends to suffer from illness easily due to low knowledgein preventing the disease and low efforts in seeking treatment[19].

The nutritional status of inpatient pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang is the majority of malnourished as many as 33 patients (64.7%). These results are in line with research at RSUP Prof. Dr. R. D. Kandou Manado with the majority of pulmonary tuberculosis patients having underweight nutritional status or underweight body mass index (BMI) of 45.50%. Poor nutritional status with macronutrient or micronutrient deficiencies increases the risk of tuberculosis due to an interruption of the immune response[20]. The majority of pulmonary tuberculosis patients have the nutritional status that can interfere with the body's immune system mediated by T lymphocyte cells so that they are more susceptible to infectious diseases including pulmonary tuberculosis[21].

Sputum examination results showed that the majority of pulmonary tuberculosis patients in Prof. DR. W.Z. Johannes Kupang have a positive AFB sputum (54.9%). This is in line with research in Ogan Ilir District, where the majority of pulmonary tuberculosis patients have sputum examination results with a positive smear of 77%[22]. AFB positive status in patients with pulmonary tuberculosis hasa greater risk to transmit the disease to others[10].

The impact of this study to the community is to know about the characteristics of tuberculosis patients, so that people can know about the risk of pulmonary tuberculosis and can reduce the cases of pulmonary tuberculosis.

CONCLUSIONS

The majority of pulmonary tuberculosis patients in RSUD Prof. DR. W.Z. Johannes Kupang are male (60.8%), ages 45-55 years (35.3%), elementary school education status (35.3%), malnutrition status (64.7%), and AFB smear-positive sputum (54.9%).

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