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Diagnostic Overview and Management of Adult Pulmonary Tuberculosis Patients Inpatient at RSU Royal Prima Medan in 2020

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ABSTRACT

Tuberculosis is an inflammatory disease of the lung parenchyma caused by infection with *Mycobacterium tuberculosis*. This research aims to find out the description of the diagnosis and management of adult pulmonary TB patients hospitalized at RSU Royal Prima Medan in 2020. This study is a descriptive study. This study is based on medical record data on inpatients with a diagnosis of pulmonary TB at the Royal Prima General Hospital Medan in 2020. The youngest patient was 18 years old and the oldest was 82 years old. The main complaint was shortness of breath (53%), additional complaints were cough (48%), symmetrical physical examination of the thorax (91%), positive sputum smear examination (72%), combined medical management of pulmicort + fumadryl + paracetamol + levofloxacin + OAT category I (72%), the longest length of stay was 7-8 days (38%), the shortest was 11-12 days (1%). In conclusion, pulmonary TB occurs more in men in the 37- 45 year age group (22%), the most complaints are shortness of breath (53%), and the most widely used combination treatment is pulmicort + fumadryl + paracetamol + levofloxacin + drugs anti tuberculosis category I (72%).

1. Introduction

Pulmonary tuberculosis (TB) is still a burden of health problems in Indonesia today.[1] The number of new cases or the number of incidences of pulmonary TB in Indonesia in 2016 was 298,128 cases. There were 156,723 smear-positive cases, including 39% women and 61% men, of which 1% were children and 99% were adults. Case notification rate (CNR) is a number that shows the number of new smear-positive tuberculosis patients and was found to be 61%. While the case detection rate (CDR) of pulmonary TB cases was 60.59%. Data from the North Sumatra Provincial Health Office in 2016 stated that the number of pulmonary TB cases in North Sumatra in 2016 was found to be 17,798 cases. AFB positive found in 11,771 cases, including 34% women and 66% men, including 1% children and 99% adults with CNR-tuberculosis with smear-positive 83% and CDR 66%. According to these data, there are 3 districts/cities with the highest incidence of pulmonary TB, namely Medan City at 3,006 per 100,000, Deli Serdang Regency at 2,184 per 100,000 and Simalungun Regency at 962 per 100,000.[2,3]

Effective TB eradication started in 1950, with a 6-9 month treatment strategy. This strategy is known as DOTS (directly observed treatment short-course). The old treatment process is to kill the bacteria and make sure there are no remnants of bacteria in the body that can come back to life. TB treatment is an antibiotic to suppress *M. tuberculosis*. If there is a pause in taking medication or treatment is not

completed, it will cause drug resistance (multi-drug resistance). TB, MDR-TB). In Indonesia alone, the coverage of TB treatment with the DOTS method in 2018 was only around 53%. The diagnostic and management procedures for pulmonary TB are well known.[4,5] However, as medical techniques and medical technology continue to develop, variations in diagnostic and management procedures may occur due to different places and times. This research aims to find out the description of the diagnosis and management of adult pulmonary TB patients hospitalized at RSU Royal Prima Medan in 2020.

2. Methods

The type of research used is research with a descriptive and retrospective case study design. This study is based on medical record data related to diagnostic and management features of inpatient pulmonary TB patients at the Royal Prima General Hospital Medan in 2020. The research subjects were all inpatients with a diagnosis of pulmonary TB, of which 100 study subjects had medical records that were fully included in this study. This study uses secondary data using medical records of research subjects, where the data collection process is carried out by purposive sampling so that a minimum of 100 subjects is obtained.

Secondary data from medical records that were displayed and explored included sociodemographic data, data on complaints of research subjects, data on physical examination findings found in research subjects, data on supporting examination findings, medical therapy data, non-medical therapy data, complications, length of hospitalization and circumstances. when the patient is discharged from the hospital. Data analysis was carried out using SPSS version 26 software, for further descriptive analysis in the form of proportions presented in a narrative and distribution table.

3. Results and Discussion

The youngest patient was 18 years old and the oldest was 82 years old. Based on the age group, the highest was in the age group 37-45 years (25%) with the proportion of men 22% and the proportion of women 3% and the least in the age group of 73-82 years (3%) with the proportion of men 2% and women 1 %.

Table 1. Distribution of the proportion of adult pulmonary TB patients by age and gender who are hospitalized at RSU Royal Prima Medan in 2020

		Gender				Total	
		Male		Female			
		Frequency	%	Frequency	%	Frequency	%
Age	18-27	9	9	6	6	15	15
	28-36	13	13	2	2	15	15
	37-45	22	22	3	3	25	25
	46-54	11	11	3	3	14	25
	55-63	15	15	2	2	17	17
	64-72	8	8	3	3	11	11
	73-82	2	2	1	1	3	3
Total		**80**	**80**	**20**	**20**	**100**	**100**

Based on the main complaint, the most common was shortness of breath (53%) and the least was vomiting (3%). Based on additional complaints, the most coughing was 48% and the least was chest pain (3%). As shown in Tables 2 and 3.

Table 2. Distribution of the proportion of adult pulmonary TB patients based on the main complaint who was hospitalized at the Royal Prima Hospital Medan in 2020

Chief Complaint	Frequency	%
Shortness of breath	53	53
Phlegm cough	13	13
Bloody cough	16	16
Weakness	4	4
Decreased consciousness	4	4
Vomiting	3	3
Fever	7	7
Total	**100**	**100**

Table 3. Distribution of the proportion of adult pulmonary TB patients based on additional complaints hospitalized at RSU Royal Prima Medan in 2020

Additional Complaints	Frequency	%
Fever	46	46
Night sweats	7	7
Weight loss	17	17
Weak	6	6
Nausea	14	14
Vomiting	15	15
Cough	48	48
Chest pain	3	3
Shortness of breath	27	27
Total	**100**	**100**

Table 4. Distribution of the proportion of adult pulmonary TB patients based on additional complaints of a combination hospitalized at RSU Royal Prima Medan in 2020

Additional Complaints Combination of	Frequency	%
Fever + Shortness of breath	20	20
Cough + Fever	32	32
Chest pain + Cough + Vomiting	5	5
Shortness of breath + Weight loss	10	10
Cough + Night sweats	11	11
Weakness + Weight loss	7	7
Cough + Weight loss	8	8
Cough + Nausea + Vomiting	7	7
Total	**100**	**100**

The proportion of adult pulmonary TB patients based on physical examination was mostly symmetric (91%), and asymmetric (9%). The distribution of proportions based on physical examination palpation was not recorded in the medical record data. The distribution of the proportion of adult pulmonary TB patients based on percussion was mostly dim (85%) and normal (15%). The distribution of the proportions based on auscultation on the chest X-ray was mostly rhonchi (94%), but not recorded in the medical records for wet or dry rhonchi, followed by wheezing (27%), and wheezing (21%).

The distribution of the proportion of pulmonary TB patients based on chest X-ray examination showed infiltrates in the right and left lung fields in all pulmonary TB patients. The distribution of the proportion of pulmonary TB patients based on sputum smear examination had positive AFB results (72%), negative results (20%), and 8 patients not recorded in the medical record.

The distribution of the proportion based on medical management was mostly category I (77%), followed by category II (23%), as shown in table 5. The distribution and proportion of pulmonary TB patients based on non-pharmacological therapy management did not find any surgical therapy in hospitalized patients.

Table 5. Distribution of the proportion of adult pulmonary TB patients based on combination medical therapy hospitalized at RSU Royal Prima Medan in 2020

Medicine Combination	Frequency	%
Pulmicort + Fumadryl + Paracetamol + Levofloxacin + OAT Category I	55	55
Pulmicort + Fumadryl + Paracetamol + Levofloxacin + OAT Category II	20	20
Fumadryl + Levofloxacin + Ketorolac + Ranitidine + OAT Category I	3	3
Pulmicort + Levofloxacin + Fumadryl + Ranitidine + OAT Category I	5	5
Paracetamol + Fulmadryl + Ceftriaxone + OAT Category I	7	7
Paracetamol + Fulmadryl + Ceftriaxone + OAT Category II	3	3
Fumadryl + Pulmicort + Levofloxacin + Curcuma + OAT Category I	2	2
Fumadryl + Pulmicort + Levofloxacin + Curcuma + OAT Category II	5	5
Total	**100**	**100**

The distribution of the proportion of adult pulmonary TB patients based on complications was pleural effusion (55%), and those with the least was hemoptysis (14%).

Table 6. Distribution of the proportion of adult pulmonary tuberculosis patients by complications hospitalized at RSU Royal Prima Medan in 2020

Complications	Frequency	%
Pleural effusion	55	55
Pneumonia	33	33
Miliary TB	28	28
Hemoptysis	14	14

Table 7. Distribution of the proportion of adult pulmonary TB patients based on combination complications hospitalized at RSU Royal Prima Medan in 2020

Complications	Frequency	%
Pneumonia + Pleural Effusion	47	47
Pleural effusion + Miliary TB	22	22
Hemoptysis + Miliary TB	18	18
Miliary TB + Pneumonia	13	13
Total	**100**	**100**

The distribution of the proportion of pulmonary TB patients based on their condition when they returned home was mostly home with outpatient treatment (94%) and death (6%). The distribution of the proportion of pulmonary TB patients based on length of stay was 7-8 days (38%). Meanwhile, the minimum length of stay is 11-12 days (1%), as shown in table 8.

Table 8. Distribution of the proportion of pulmonary TB patients based on length of stay at RSU Royal Prima Medan in 2020 Treatment

Length of treatment	Frequency	%
1-2 Days	2	2.0
3-4 Days	13	13.0
5-6 Days	35	35.0
7-8 Days	38	38.0
9-10 Days	8	8.0
11-12 Days	1	1.0
13-14 Days	3	3.0
Total	**100**	**100**

In quantity more males than females who suffer from pulmonary TB but in terms of quality have almost the same opportunity, it can be seen from the proportional analysis. Gender is not a risk factor for the incidence of pulmonary TB because the role of women at this time has many activities outside the home such as work, social activities, worship activities, social gathering so that contacts with pulmonary TB sufferers also increase.[6] In addition, men who suffer from pulmonary tuberculosis and women who are nearby (the family) have the possibility of infection as well as pulmonary TB transmission through breathing when patients cough, sneeze or talk germs issued in the form of droplets (droplets). The more germs that enter the lung tissue, the higher the chance of suffering from pulmonary TB. According to several studies, men are more susceptible to infection with M. tuberculosis. This may be related to the greater smoking habit in men, which causes disorders of the respiratory tract immune system so that they become more susceptible to infection. Disorders of the respiratory tract immune system can be in the form of mucociliary damage due to cigarette smoke toxins and decreased response to antigens, thereby increasing susceptibility to pulmonary tuberculosis. In addition, men usually pay less attention to their health and their daily living habits, causing factors that trigger the occurrence of pulmonary tuberculosis. This will have an impact on a lower immune system and greater exposure factors.[7,8]

Several studies have shown that the most common additional symptom in TB patients is cough. This can be caused by infection with bacteria *Mycobacterium tuberculosis* in the lung parenchyma, irritating the bronchi. Coughing is necessary to flush the products of inflammation out. Because the involvement of the bronchi in each disease is not the same, it is possible for a new cough to develop after the disease develops in the lung tissue, that is, weeks or months after the inflammation begins. The nature of the cough starts from a dry cough (non-productive) then after inflammation arises it produces sputum (productive). A further condition is in the form of coughing up blood because there are broken blood vessels.[9]

Chest X-ray plays an important role in the early detection of pulmonary TB. Tuberculosis is often found on chest X-ray which is initially examined for medical check-up and examination for operative tolerance. In patients with smear-positive sputum, chest X-ray plays an important role in assessing the extent of the lesion and the complications that occur. At the end of TB treatment, a chest X-ray plays a role in the assessment of sequelae in the lung as well as in the pleura. This figure shows that we must consider that fibroinfiltrate, classification, cavity, pleural effusion lesions and combination abnormalities on chest X-ray can also be found in other chronic diseases such as fungal lung

infections *(Actinomycosis, Nocardiosis, Blastomykosis, Histoplasmosis, Coccidioiodomycosis)*; Lung infections due to bacteria such as *Pneumococcal pneumonia* and chronic inflammatory processes due to exposure to heavy metals (pneumoconiosis, smoking, radiation pneumonitis) as well as lung inflammation that occurs due to chronic allergic processes of alveolar or lung neoplasms. [10-11]

The results showed that most pulmonary TB patients received anti-tuberculosis drugs (OAT) category 1. The combination of OAT used by the National Tuberculosis Control Program in Indonesia, namely category 1 was 2(HRZE)/4(HR)3, category 2 is 2(HRZE)S/(HRZE)/5(HR)3E3. In addition to these two categories, and insert drug alloy (HRZE) is provided. The drugs used in the management of drug-resistant TB patients in Indonesia consist of second-line anti-TB drugs, namely Kanamycin, Capreomycin, Levofloxacin, Ethionamide, cycloserine, and PAS, as well as first-line OATs, namely pyrazinamide and ethambutol. The combination of category-1 and category-2 OAT is provided in the form of a fixed-dose combination drug (OAT-KDT). KDT OAT tablets consist of a combination of 2 or 4 types of drugs in one tablet. The dose is adjusted according to the patient's weight. This combination is packaged in one package for one patient. The Kombipak package is a loose drug package consisting of Isoniazid, Rifampicin, Pyrazinamide, and Ethambutol which is packaged in blister form. This OAT combination program is provided for use in the treatment of patients who experience side effects of OAT KDT. [4.5]

4. Conclusion

The highest age group is 37-45 years (25%) and the least is 73-82 years (3%). The most frequent chief complaint was shortness of breath (53%) and the least was vomiting (3%). The most additional complaint was cough (48%) and the least was chest pain 3%. Physical examination; inspection, symmetrical thorax (91%), thoracic palpation data not recorded in medical records, dim thoracic percussion (85%), and auscultation revealed rhonchi (94%). Supporting investigation; Chest X-ray showed infiltrates in the right and left lung fields. All TB patients with AFB sputum examination were smeared positive (72%), negative (20%), and 8 patients were not recorded in the medical record. The highest number of medical treatments were category I (72%), and category II (28%). Based on the most complications, pleural effusion (55%), and the least hemoptysis (14%). Based on the length of stay the most 7-8 days (38%), and the shortest was 11-12 days (1%).

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