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THE CORRELATION BETWEEN LEPROSY TYPE AND GRADE OF DISABILITY IN LEPROSY PATIENTS IN SAMARINDA

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ABSTRACT

Leprosy or Hansen's disease is a disease caused by obligate bacteria, Mycobacterium leprae. This disease is a chronic infectious disease with the first affinity in the peripheral nerves. The worst complication of this disease is disability and causes sufferers to be excluded from their social activities. There are several factors that play a role in the occurrence of leprosy defects, one of them is the type of leprosy. This research aims to determine the correlation between the type of leprosy and the grade of disability in leprosy patients in Samarinda. This research was an analytic observational study. Data collection was done by visiting all Community Health Center (Puskesmas) in Samarinda and the medical records of leprosy patients recorded from January 2014-February 2019. The sampling was using a purposive sampling technique. The result showed 106 patients who met the inclusion and exclusion criteria. Data analysis was using the Kolmogrov-Smirnov test which obtained p = 0.764, so it could be concluded that there was no correlation between the type of leprosy and the grade of disability in leprosy patients in Samarinda.

Keywords: Type of Leprosy, Leprosy disability

INTRODUCTION

Leprosy is a disease caused by Mycobacterium leprae. This bacterium is obligate intracellular and is one of the chronic infectious diseases[1]. Leprosy is a disease that is prevalent in developing countries and causes very complex problems, not only involving the medical aspect but also includes social, economic, cultural, security and national security issues[2].

The World Health Organization (WHO) noted that the prevalence of leprosy registered globally at the end of 2017 was 192,173 cases with the number of new cases reported globally during 2017 being 210,671 (2.8 new cases per 100,000 people). New cases decreased from 214,783 cases in 2015 and 211,973 cases in 2015. The number of new cases that have declined still places Indonesia in the top three countries with the highest number of leprosy cases in the world after India and Brazil[3].

The Ministry of Health of the ReCommunity of Indonesia noted that the number of new cases of leprosy in Indonesia was 10,477 cases (4.00 cases per 100,000 population) with the top three provinces having the most cases are East Java, West Java, and South Sulawesi. This number has decreased from the previous year with a number of new cases of 16,826 cases (6.50 cases per 100,000 population). New cases of leprosy recorded in East Kalimantan in 2017 were 153 cases[4].

Leprosy is a curable disease, however, if it is not treated properly, it can cause disability[5]. Disability can be defined as the inability of bodily functions (biological), activity, personality (psychological

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aspects), environmental or social (participation), experienced by people who suffer from a disease or have special conditions. The World Health Organization (WHO) classifies Leprosy disability based on the WHO grading system, such as Grade 0: normal sensation, no visible impairments, Grade 1: impaired sensation, no visible impairments due to leprosy, and Grade 2: visible impairments/deformity[6]. Leprosy disability can occur by several risk factors, one of which is the type of leprosy. The type of leprosy based on operational classification by WHO is divided into two types, the type of pausibacillary (PB) and the multibacillary type (MB)[6].

Several studies on the relationship of type of leprosy with the grade of disability in leprosy patients have been done, but, there is still controversy about it and there is no similar study in Samarinda. The purpose of this study was to determine the correlation between the types of leprosy and the grade of disability in leprosy patients in Samarinda.

METHODOLOGY

This study was an observational analytic study with a cross-sectional approach conducted in all Community Health Centers (Puskesmas) in Samarinda in February-March 2019. Secondary data were taken from the medical records of leprosy patients in Samarinda. The inclusion criteria in this study were leprosy patients who had been or were undergoing outpatient treatment at the Community Health Center in Samarinda and were diagnosed with leprosy in January 2014 - February 2019. Exclusion criteria in this study were leprosy patients who did not have complete data and leprosy patients with disabilities that were not caused by leprosy such as congenital defects or defects due to amputation. Determination of the type of leprosy and leprosy disability were based on the patient's medical record when they were first diagnosed with leprosy. Data processing and analysis were using Microsoft Office Word 2007, Microsoft Office Excel 2007 and SPSS Statistics 24. This study had received ethical approval from the Medical Research Ethics Committee of the School of Medicine of Mulawarman University with letter number 08/KEPK-FK/II/2019.

FINDINGS AND DISCUSSION

From 26 Community Health Center in Samarinda, leprosy cases were found in 21 Community Health Center with a total of 106 subjects. There were more patients with MB leprosy than PB leprosy type found in this study. Similar research results were reported in studies conducted in Blora Regency, Central Java and Minas Gerais, Brazil[7,8]. MB leprosy has a faster spread of bacilli than PB type. The higher number of lesions in MB leprosy sufferers also facilitates the transmission of this type of leprosy to others[9,10].

Leprosy disabilities are classified as defects in the hands and feet as well as eye defects and each has a defect grade of 0, 1, and 2. The grade of defect in this study was taken from the worst level of disability[2]. The researchers found that patients with Grade 0 or normal sensation, no visible impairments as the highest defect grade. Research conducted in Lamongan District, East Java reported similar result to this study[11]. Patient's compliance in undergoing treatment, support from families so that people with leprosy follow their treatment, and self-care to prevent disability were things that can reduce the number of disabilities in leprosy patients[12,13]. Analysis of the correlation between type of leprosy and the grade of disability in leprosy patients in Samarinda was using the Kolmogrov-Smirnov test. The Kolmogrov-Smirnov test result can be seen in Table 1. Based on the results, it is found that most of the leprosy patients in Samarinda had MB leprosy type with a defect grade of 0. The analysis result obtained a P value = 0.764 which means that there was no correlation between the type of leprosy with the

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grade of disability in leprosy patients in Samarinda City. Other studies that found similar result were reported in studies in Lamongan Regency, East Java, Bandar Lampung, and Minas. Gerais,. Brazil [8,11,14].

Table 1. Bivariate Test Result of the Correlation between Leprosy Type and Grade of Disability in Leprosy Patients in Samarinda City

Type of Leprosy	Grade of Leprosy Disability						Total		P
	2		1		0				
	N	%	N	%	N	%	N	%	
MB	5	4,7	8	7,6	57	53,8	70	66,1	
PB	0	0	3	2,8	33	31,1	36	33,9	0,764
Total	5	4,7	11	10,4	90	84,9	106	100	

The theory by Amirudin stated a different argument that is that MB sufferers are more prone to peripheral nerve damage and end up with disabilities due to the spread of leprosy bacilli to all parts of the body especially the peripheral nerves as a result of weak cellular immunity[9]. The researchers analyzed the patients who had memory defects with grade 1 and 2 univariately and the results of the analysis can be seen in table 2.

Table 2. Profile of Patients with Leprosy Disabilities in Grade 1 and 2 in Samarinda

No.	Gender	Age	Type of Leprosy	Grade of Disability	Type of Disability
1.	Female	19	MB	1	Hands / Feet
2.	Male	21	MB	1	Hands / Feet
3.	Female	21	MB	1	Hands / Feet
4.	Male	51	MB	1	Hands / Feet
5.	Male	22	MB	1	Hands / Feet
6.	Male	28	MB	1	Hands / Feet
7.	Male	63	MB	1	Hands / Feet
8.	Male	47	MB	1	Hands / Feet
9.	Male	57	PB	1	Hands / Feet
10.	Male	22	PB	1	1 Hand / Feet
11.	Male	30	PB	1	Hands / Feet
12.	Female	61	MB	2	Hands / Feet
13.	Male	60	MB	2	Hands / Feet and Eye
14.	Male	70	MB	2	Hands / Feet
15.	Male	37	MB	2	Hands / Feet and Eye
16.	Female	44	MB	2	Hands / Feet

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The researchers found that grade 1 and level 2 disability were more common in males than females. Rismayanti et al. in their research in Gowa Regency, South Sulawesi and Rambey in their research in Lamongan Regency, East Java stated similar results [15.16]. The high occurrence of disability in male leprosy sufferers than in women is caused by the fact that males tend to get more exposure to trauma and physical stress when working outside their home[17].

Majority of patient with disabilities were at the age of ≥ 14 years with the average age of patients was 40.81 ± 17.89 years. Similar result was reported in a study conducted in Gowa Regency, South Sulawesi[15]. Disabilities of leprosy sufferers were more common in elders than children because disability in elders tends to be faster due to physical conditions and decreased organ function[18]. In this study, the researchers found that patients who had disabilities more were those with MB leprosy. Similar result was reported by Firdaus in his research in Mojokerto Regency, East Java[19].

Factors that cause the MB type to cause disability are the MB type of leprosy which contains a lot of M. leprae bacilli and the immune system of patients with very bad disease because cellular immunity in patients with type MB is low or they do not have immunity at all[19].

Hands and feet defects are the most common type of disability that the researchers found in this study. Patients with eye defects were only found in 2 patients who also had hands and feet defects. The most common complaint of grade 1 disability was loss of sensation (anesthesia) in the hands and/or feet. The most common complaint in patients with grade 2 disabilities was the presence of foot ulcers. Eye defects experienced by patients in the form of lagoftalmos (difficulty of opening eyes) with blurred vision. What causes anesthesia in leprosy patients who have grade 1 disability is because in the more severe type of leprosy (MB leprosy type), extensive nerve damage occurs, including peripheral nerves, causing anesthesia in the limbs. Ulcers in leprosy patients who have grade 2 disability are caused by widespread anesthesia and patient's lack of care to prevent disability hence they experience ulcers but do not feel the pain. Lagoftalmos and blurred vision in leprosy patients with grade 2 disability may be caused by eyelid muscle weakness due to damage to the motor nerve and also damage to the sensory nerves in the eye which caused the blurred vision[20].

CONCLUSION

The conclusion based on the results and discussion that has been described above is that there is no correlation between the type of leprosy and the grade of disability in leprosy patients in Samarinda. Patients who have leprosy defects arewere mostly males, age ≥ 14 years, suffering from MB type, and types of disabilities were in the form of hand and foot defects.

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