Distribution of Leprosy Patients with and without Plantaris Ulcers

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ABSTRACT

Background: Leprosy is a chronic infectious disease caused by obligate intracellular Mycobacterium leprae, impacting public health. Leprosy causes deformity, and disability can lead to ulcer disease. Nerve involvement is essential in the emergence of ulcers on the feet, including in neuropathic ulcers. Neuropathic ulcers can be found on the soles of the feet and are often called plantar ulcers. The slow healing process of the ulcer will cause the plantar ulcer to become chronic. **Purpose:** To evaluate the characteristics of leprosy patients with and without plantar ulcers at the Leprosy Division of Dermatology and Venereology Outpatient Clinic of Dr. Soetomo General Academic Hospital, Surabaya, 2015-2019. **Methods:** A retrospective study were conducted by examining medical records for five years (2015-2019) at the Leprosy Division of Dermatology and Venereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya. **Results:** A total of 511 patients met inclusion criteria. In leprosy patients without plantar ulcers group, the characteristics were male (68%), female (32%), aged 26-35 years (25.4%), paucibacillary (8.1%) and multibacillary (91.8%), patients without leprosy reactions (58%), and patients under treatment (49%). In leprosy patients with plantar ulcers group, the characteristics were male (64.3%), female (35.7%), aged 26-35 years (31%), multibacillary (92.9%), patients without leprosy reactions (61.9%), patients in the RFT category (76%), the ulcer duration group with highest prevalence rate 1-6 months (38.1%), and the most common location of plantar ulcers was on the forefoot (95.2%). **Conclusion:** Leprosy without plantar ulcers was more common than leprosy with plantar ulcers, mostly in male, dominated in the 26-35 years old for patients leprosy without plantar ulcers, type MB (multibacillary) was most history of leprosy type. Leprosy without reaction was common in leprosy patients with and without plantar ulcers. Patients without plantar ulcers majority was MDTL therapy, patients with plantar ulcers was common RFT (Release From Treatment).

Keywords: leprosy, plantar ulcer, public health, neuropathic.

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BACKGROUND

Leprosy, also called Morbus Hansen, was founded by G.A. Hansen in 1873. Leprosy attacks various parts of the body, including nerves and skin. Intracellular obligate organisms cause leprosy. Mycobacterium leprae is an aerobic germ.[1] This disease can affect a person's quality of life, and cause severe complications to deformities, therefore health services usually evaluate emotional, social, and ability to perform activities in life. The World Health Organization (WHO) stated that the global prevalence of leprosy in 2019 registered 202,256 cases.[2] Of the cases, 14,893 were children under the age of 14, and the detection rate of new cases among the child population was recorded at 7.9 per million child population.

One of the defects caused by leprosy is plantar ulcers. Factors that affect the onset of plantar ulcers are sensory disorders, atrophy and fibrosis of leg muscle fibers, disorders of the autonomic nervous system so that the skin becomes dry, anhidrosis, and hyperkeratosis.[3] Nerve involvement plays an essential role in the onset of ulcers, namely neuropathy, including in the category of neuropathic ulcers. Inadequate ulcer treatment can cause ulcers to become chronic, compact, and diseased.[4] The above situation encourages researchers to conduct detailed research on the characteristics of leprosy patients with and without plantar ulcers at the Leprosy Division of Dermatology and Venereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya. It indicates that there is still an active and unbroken

chain of transmission and less full preventive measures, early detection, and management in patients.

METHOD

This type of research is a descriptive reasearch. It only concludes the sample without making inferences about the population. The study was designed using the observational sampling technique using the total population sampling method. The research instrument used was medical record data of leprosy patients with and without plantar ulcers that were treated at Leprosy Division of Dermatology and Venereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya from 2015-2019. The data obtained were processed using SPSS and Microsoft Excel programs.

RESULTS

This research used the total sampling technique. Out of 578 leprosy patients in 2015-2019, 511 patients qualified for inclusion criteria. The variables were gender, age, history of leprosy type, history of leprosy reactions, and history of MDTL treatment.

Figure I. Sex characteristics in leprosy patients with and without plantar ulcers at Dr. Soetomo General Academic Hospital Surabaya's Leprosy Division of Dermatology and Venereology Outpatient Clinic from 2015 to 2019.

In the sex distribution, 321 leprosy patients without plantar ulcers were found to be male. Patient of the female sex was 148 patients. The distribution of sex in leprosy patients with plantar ulcers of male sex amounting to 27 patients. Total number of female sex amounted to 15 patients.

Table 1. Age distribution in leprosy patients with and without plantar ulcers at Dr. Soetomo General Academic Hospital Surabaya's Leprosy Division of Dermatology and Venereology Outpatient Clinic from 2015 to 2019

Age (years old)	With Plantaris Ulcers	Without Plantarial Ulcers	Total
0 to 5	0	0	0
5 to 11	0	0	0
12 to 16	3	85	88
17 to 25	7	98	105
26 to 35	10	99	109
36 to 45	8	90	98
46 to 55	6	54	60
56 to 65	5	30	35
>5	3	13	16
Total	42	469	511

Leprosy patients without plantar ulcers aged 26-35 years became the age group with the highest incidence of leprosy without plantar ulcers, which was 99 patients. Age distribution in leprosy patients with plantar ulcers in the age group of 26-35 years consisted of 10 patients.

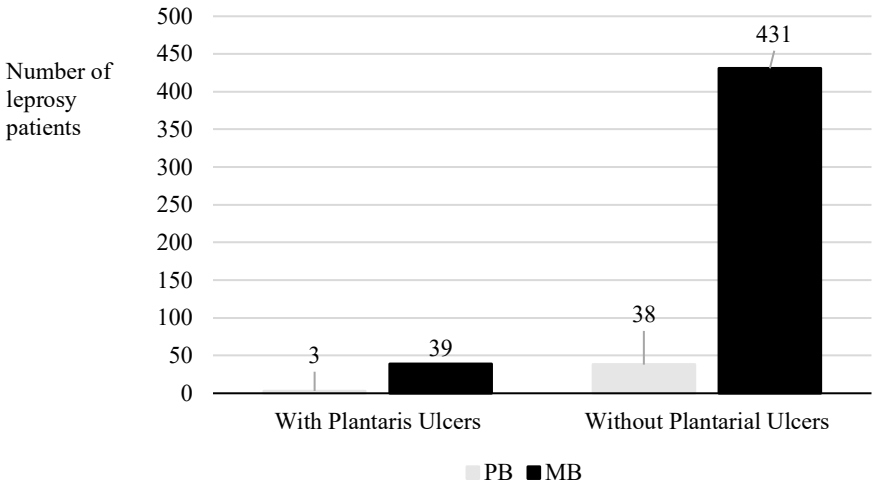

Figure 2. Leprosy type in leprosy patients with and without plantar ulcers at Dr. Soetomo General Academic Hospital Surabaya's Leprosy Division of Dermatology and Venereology Outpatient Clinic from 2015 to 2019.

The distribution of the history of leprosy type in leprosy patients without plantar ulcers showed the total number of patients with PB (paucibacillary) was 38 patients and MB (multibacillary) was 431 patients. Distribution of the history of the most common leprosy type in leprosy patients with plantar ulcers is MB (multibacillary), total of 39 patients and PB (paucibacillary) was 3 patients.

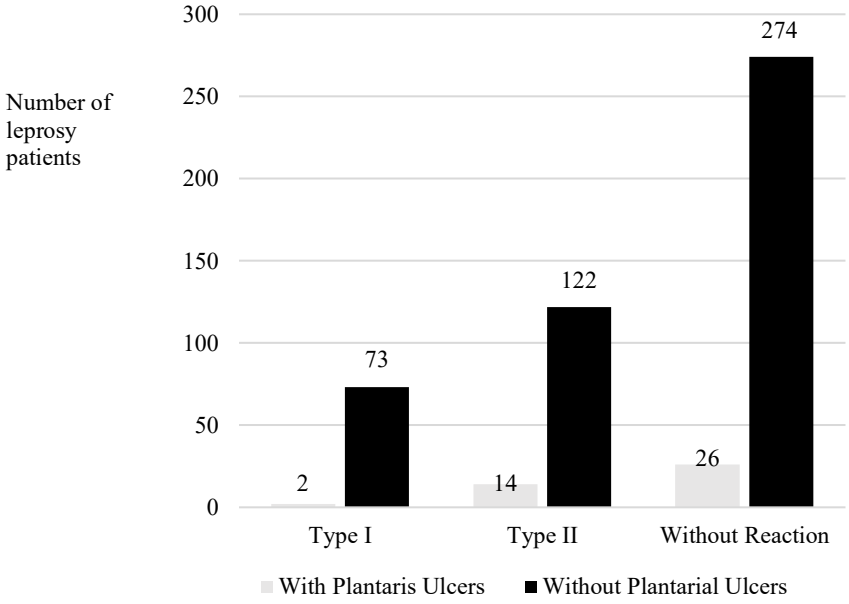

Figure 3. The history of leprosy reactions in leprosy patients with and without plantar ulcers at Dr. Soetomo General Academic Hospital Surabaya's Leprosy Division of Dermatology and Venereology Outpatient Clinic from 2015 to 2019.

The distribution of the history of leprosy reactions in leprosy patients without plantar ulcers in the category of without leprosy reaction was 274 patients. Distribution of the history of leprosy reactions in leprosy patients with plantar ulcers without reaction amounted to 26 patients.

Distribution of MDTL treatment history in leprosy patients without plantar ulcers found that the majority of leprosy patients experienced a reaction while doing treatment with a total of 230 patients, while before treatment were 33 patients and had completed treatment were 206 patients. Distribution of MDTL treatment history in leprosy patients with plantar ulcers discovered that the release from treatment (RFT) group had 26 patients.

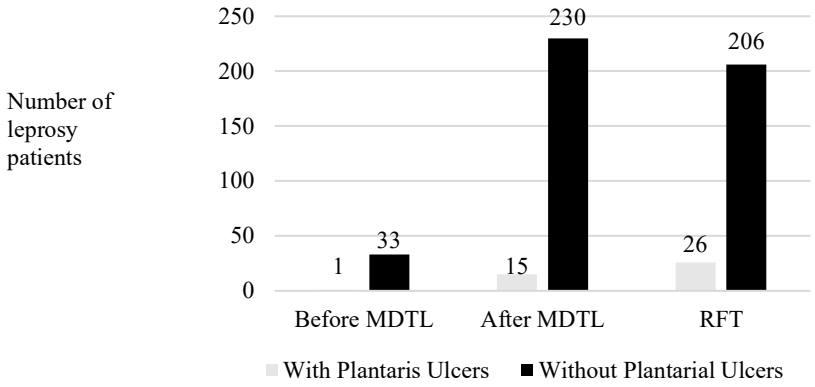

Figure 4. MDTL treatment history in leprosy patients with and without plantar ulcers at Dr. Soetomo General Academic Hospital Surabaya's Leprosy Division of Dermatology and Venereology Outpatient Clinic from 2015 to 2019.

DISCUSSION

In the sex distribution, 321 leprosy patients without plantar ulcers were found to be male (68%). Patient of the female sex was 148 patients (32%). The distribution of sex in leprosy patients with plantar ulcers of male sex amounting to 27 patients (64.3%). Total number of female sex amounted to 15 patients (35.7%). Another study conducted by Lubis in 2012 at Sicanang Belawan Island Leprosy Hospital stated that male sex was the most commonly found study subject in plantar ulcers at 19 people (52.78%).[6] The cause of the absence of differences in male leprosy patients with and without plantar ulcers is that sex is closely related to determining a person's attitude and behavior.[7]

Leprosy patients without plantar ulcers aged 26-35 years became the age group with the highest incidence of leprosy without plantar ulcers, which was 99 patients (25.4%). Several other studies support the results of this study. Age distribution in leprosy patients with plantar ulcers in the age group of 26-35 years consisted of 10 patients (31%) in 2015-2019. Another study found that plantar ulcer occurred in adulthood (80%), which is the age of 20-60 years according to WHO.[9] From this study, it can be concluded that chronic diseases such as leprosy with plantar ulcers are known to occur at all ages, ranging from infants to old age (3 weeks to more than 70 years).[9] This was considered due to the nature of leprosy germs that take up to 20 hours to survive. Therefore, the incubation period in the human body reaches 5-7 years. Incompetency in the immune system can lead.[10]

The distribution of the history of leprosy type in leprosy patients without plantar ulcers showed the total number of patients with PB (paucibacillary) was 38 (8.1%), and MB (multibacillary) was 431 (91.8%). Based on these figures, the most common leprosy type was MB (multibacillary). Some studies also say that MB (multibacillary) type is more common in leprosy patients with 79.4% than PB (paucibacillary) type, only 20.4% percentage.[10] Distribution of the history of the most common leprosy type in leprosy patients with plantar ulcers is MB (multibacillary), with a total of 39 patients (92.9%). At the same time, the least leprosy type is PB (paucibacillary), with 3 (7.1%). Another study conducted by Lubis in 2012 at Sicanang Belawan Island Leprosy Hospital mentioned that as many as 22 patients (66.67%) had leprosy MB (multibacillary) type. The research concluded that leprosy type MB (multibacillary) is more common than the PB type because the MB (multibacillary) type is more contagious than the PB (paucibacillary) type.[11] MB (multibacillary) type occurs in individuals with low immune systems, usually in older individuals.[12] Due to the high proportion of new patients with leprosy type MB (multibacillary), this type has symptoms that are more visible than the PB (paucibacillary) type or caused by late and irregular administration of MDT.[13]

The distribution of the history of leprosy reactions in leprosy patients without plantar ulcers in the category of without leprosy reaction was 274 patients (58%). The study was in line with Lynoora's study, which stated that the distribution of leprosy patients without more reactions were 16 patients (59.3%), while leprosy patients with reactions were only 11 patients (40.7%)[9]. Distribution of the history of leprosy reactions in leprosy patients with plantar ulcers without reaction amounted to 26 patients (61.9%). A study conducted by Harahap found that the prevalence leprosy patients by plantar ulcers distribution based on reactions showed as many as 38 patients (48.1%), with type 1 reactions only 5 patients (6.3%), and type 2 reactions inas many as 33 patients (41.8%). Those who did not experience leprosy

reactions were 41 patients (51.9%).[14] This can be proven by the results of studies that shows the average plasma MDA level in leprosy patients without reaction is higher than that of type 2 reaction. High MDA levels are due to patients having jobs that require considerable physical activity, and some of these jobs require more frequent interaction with others. It can also affect high oxygen levels, resulting in average oxidant levels in leprosy patients without a higher reaction.[14]

Distribution of MDTL treatment history in leprosy patients without plantar ulcers found that the majority of leprosy patients experienced a reaction while doing treatment with a total of 230 patients (49%), while before treatment were 33 patients (7%) and had completed treatment were 206 patients (43.9%). This study is in line with Irsan et al research with the title "Leprosy in Pontianak City Health Center Period 2008-2013", which stated that of 37 patients of leprosy reaction, 26 patients (70.2%) are known to experience reactions while in treatment, and 11 patients (29.8%).[15] The length of treatment affects the incidence of leprosy reactions.[16] Distribution of MDTL treatment history in leprosy patients with plantar ulcers discovered that the Release From Treatment (RFT) group had 26 patients (61.9%). Another study conducted by Anandan in 2016 on the efficacy of plantar ulcer therapy showed more patients in the RFT group which was 38 patients (76%). Meanwhile, research conducted by Igaa and Rusyati discussed the incidence of relapsing in plantar ulcer patients with leprosy.[17] It explains that patients who have completed full MDT treatment and were declared RFT can relapse with criteria such as new lesions accompanied by a decrease in sensory function in the form of pressure, pain, or temperature in the lesion.[17] Some leprosy germs die and disintegrate, resulting in many antigens being released and reacting with antibodies, activating the complement system.[18]

Based on the discussion results above, it can be seen that there are more leprosy patients without plantar ulcers (469 patients) than leprosy patients with plantar ulcers (42 patients). Mostly gender in female, dominated in the 31-40 years old for patients leprosy without plantar ulcers The MB (multibacillary) type is more common in leprosy than the PB (paucibacillary) type. Patients without reaction are more at risk of leprosy.

Therefore, further research is needed for a better and more complete recording of medical records, especially on the identity of patients in the future. Using inclusion criteria and more specific exclusion criteria, medical students (S1) can research the level of knowledge, attitudes, and actions of leprosy patients with and without plantar ulcers at the Leprosy Division of Dermatology and Venereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya. Finally, Dermatology and Venereology residents can follow up the results of medical student research (S1) by providing counseling to leprosy patients on how to prevent and treat plantar ulcers properly, then reevaluating them after a few months.

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