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DIFFERENCE IN SIZE OF LEPROSY PEDIS ULCER INJURY BEFORE AND AFTER THERAPY AT LEPROSY HOSPITAL DONOREJO, JEPARA REGENCY

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ABSTRACT

Background: Leprosy sufferers who experience disability at the time of diagnosis are usually late in seeking treatment because they are less aware of their health. Central Java Province ranks third with new cases of leprosy as many as 1,644 cases, after East Java (3,373), West Java (1,813) Provinces. It can be concluded that in Central Java there are still new cases of leprosy that if not treated properly will cause disabilities. Thus, level 2 disabilities in the form of foot ulcers should always be monitored and treated properly. **Aim:** Observe the success rate of several types of therapy for leprosy with foot ulcer at Donorejo Kelet Leprosy Hospital in Jepara Regency, and identify the grade and depth of ulcers before and after therapy. **Method:** Descriptive observational research (case study) using primary data obtained from questionnaires and weekly evaluation results regarding the size development of foot ulcers in leprosy for 4 weeks. Secondary data in the form of the given therapy were obtained from medical records. Data collected was processed descriptively covering general data such as age, sex, nutritional status, and special data including the patients' risk factors (history of smoking, hygiene, wound size in centimeters (numerical data)). The data obtained were then compared between before and after therapy, and were analyzed with each other. **Result:** There were nine cases of leprosy with a foot ulcer, consisting of eight male patients and one female patient. The most common risk factor is smoking. After the leprosy patients were being treated for four weeks conventionally (wearing footwear, dressing, wound hygiene) and pharmacologically, there was a significant change in the reduction in wound volume with $p=0.008$ ($p<0.05$).

Keywords: Foot Ulcer in Leprosy, Characteristic, Therapy, Wound Healing, Risk Factor

INTRODUCTION

Leprosy is a chronic disease that is generally found in developing countries, caused by the infection of Mycobacterium leprae which first attacks the peripheral nerves, then can attack the skin, oral mucosa, upper respiratory tract, upper reticuloendothelial system, eyes, muscles, bones, and testes, except central nervous system. In most infected people can be asymptomatic, but a small percentage show symptoms and tend to become disabled, especially in hands and feet.[1,2]

The number of new cases of leprosy in the world in 2015 was around 210,758 people. Of these, the most are in the Southeast Asian region (156,118) followed by the American region (28,806) and Africa (20,004), and the rest are in other regions. Indonesia itself ranks third (17,250) with the highest number of lepers in the world after the Indian countries (134,752) and Brazil (33,307), this sequence has not changed since 2009.[3] In the Southeast Asian region, Indonesia ranks highest, Myanmar is in the top position. came in second with 3,082 cases, and the Philippines was third with 2,936 cases.[2]

Indonesia itself has reached the status of leprosy elimination in 2000, with leprosy prevalence <1 per 10.000 population (<10 per 100.000 population). After that, Indonesia can still reduce the number of leprosy events even though it is relatively

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slow. The prevalence rate in Indonesia in 2017 was 0.70 cases per 10,000 population with a discovery rate of new cases 6.08 cases per 100,000 population, with a total of 15,910 cases. It was found that the rate of a defect in 2 leprosies in 2017 was 4.26 per 1 million population, decreased compared to 2016 which was 5.27 per 1 million population. Besides, there are several provinces whose prevalence is still above 1 per 10,000 population. This prevalence rate cannot yet be declared free of leprosy and occurs in 10 provinces in Indonesia.[1]

The level of leprosy disability according to WHO is divided into 3 levels, namely level 0, 1, and level 2 disabilities. Every new patient found must be noted the level of disability. Each organ (eyes, hands, and feet) is given its level of disability. In level 2 defects can be seen whether there are defects or damage see non the palms or feet such as the occurrence of ulcers, curly fingers, and Semper's legs. So that prevention and care efforts must be implemented properly. Prevention efforts and care services can be done both at home, health centers, and referral service units such as public hospitals or referral hospitals. Therefore we need an evaluation of the treatment that is usually done at leprosy referral hospital so that later they can find out the most appropriate way in handling disabilities.[2,3,4]

Referral services require more complex interventions. Some of these interventions require specialist treatment. Such as the handling of patients with level 2 disability Jepara Regency itself has a Rehata Hospital which is now subdivided into Donorejo Hospital as a leprosy referral hospital that specifically provides services to people with leprosy. According to data from the Department of Health J Jepara Regency health profile in 2013-2015, the number of new leprosy case finding is increasing every year. The discovery rate in 2015 was 9.59 so it was categorized as Low Leprosy Load. For level 2 disabilities decreased from 2014 by 11.49%, and in 2015 it was found 6.14%. Even though there is a decrease in 2 levels 2 disability, a treatment evaluation needs to be done so that it can further reduce the level 2 disability.[5]

Leprosy sufferers who experience disability at the time of diagnosis are usually late - in seeking treatment because sufferers are less aware of their health, pay less attention to skin disorders they suffer such as white or red spots - accompanied by a numbness that develops slowly so that the patient is ignored. Patients usually only seek treatment if the disorder has disrupted their activities. Leprosy can cause numbness in the nerves so that patients do not feel pain when stepping on sharp objects, heat, rough, or there is a bruise that is not heeded the result will be ulcers or ulcers on the pedis. So that if the foot is still used for walking, while the foot accommodates a weight load, as a result, the injury is increasingly damaged. The level of severe disability will be able to reduce even make the patient unable to work, can also create a negative image that leads to discrimination and social stigma against individuals and families.[6]

Thus the level 2 disability in the form of pedis ulcers must always be monitored and done the right treatment. So it is necessary to conduct a therapeutic evaluation of pedis ulcers. So that later individuals who experience it can recover and be able to return to their activities. Then the researcher is interested in evaluating the form of therapy that is usually carried out at Donorejo Kelet Hospital in Jepara Regency as a leprosy referral hospital.

METHODS

This study uses an observational analytic study, using the Wilcoxon dan test and T-test. Performed at the Leprosy Donorejo Hospital, Jepara Regency. Target

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The target population is leprosy patients with pedis ulcers, while the dependent population is leprosy patients with pedis ulcers at Leprosy Donorejo Hospital in Jepara Regency in June-September 2019. This study used a total sampling method. Research data obtained from filling out questionnaires and secondary data obtained from patient medical records.

Assessing the Area of Pedis Ulcer Using the Ruler Method

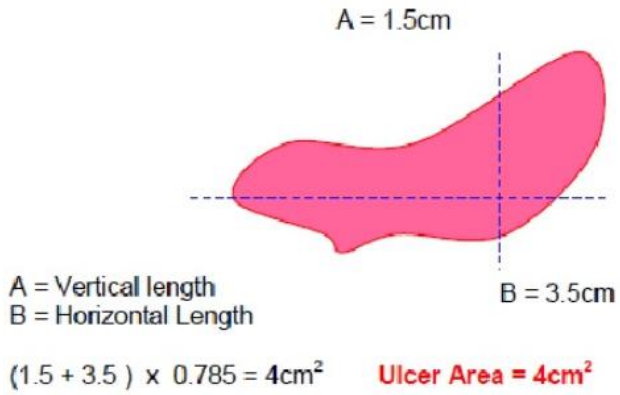

Figure 1. Assessing Ulcer Area[15]
A. Biggest distance between 2 points on the edge, longitudinal
B. Biggest distance between 2 points on the horizontal edge
The Ulceration area can then be calculated by the formula:

(Horizontal length + longitudinal length) x 0,785

Data Analysis

This research data processing includes editing (checking the completeness, clarity, and data continuity), coding (giving score data), tabulation data, and entry (enter data in a Microsoft Excel computer program). Data analysis includes a descriptive analysis that will display the frequency and presentation, and analytical tests using the statistical test with the Shapiro-Wilk normality test, Wilcoxon test, T-test, One Way ANOVA test.

RESULTS

Table 1. Descriptive Data

Variable	F	%
Age		
0 – 17 years	0	0
18 – 65 years	7	77,8
66 – 79 years	2	22,2
Gender		
Male	8	88,9
Female	1	11,1
Nutritional Status		
Skinny	1	11,1

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Normal	5	55,6
Overweight	3	33,3
Smoking History		
Yes	4	44,4
No	5	55,6
Hygiene History		
Often	8	88,9
Sometimes	1	11,1
Use of Footwear		
Yes	6	66,7
Sometimes	1	11,1
No	2	22,2
Implementation of Bed Rest		
Often	4	44,4
Sometimes	5	55,6
Control Routine		
Often	8	88,9
Sometimes	1	11,1

Table 2. Descriptive and Normality Vol. Ulcers with Shapiro-Wilk Test

Vol. Ulcer	Mean ± SD	Median (min-max)	P
Week 1	9,28 ± 7,84	5,4 (2,3 – 25,8)	0,084*
Week 4	4,84 ± 3,63	3,93 (1,3 – 11)	0,018

Note : * Normal (p > 0,05)

Table 3. The difference in Week 1 and Week 4 Ulcer Volumes with Wilcoxon Test

Vol. Ulkus	Mean ± SD	p
Week 1	9,28 ± 7,84	0,008*
Week 4	4,84 ± 3,63	

Note: * Significant (p < 0,05)

Table 4. Descriptive Volume of Ulcers Weeks 1-4

Vol. Ulcer	Mean ± SD	Median (min-max)
Week 1	9,28 ± 7,84	5,4 (2,3 – 25,8)
Week 2	8,21 ± 6,43	5,4 (1,8 – 20,4)
Week 3	6,61 ± 6,11	3,93 (1,3 – 18)
Week 4	4,84 ± 3,63	3,93 (1,3 – 11)

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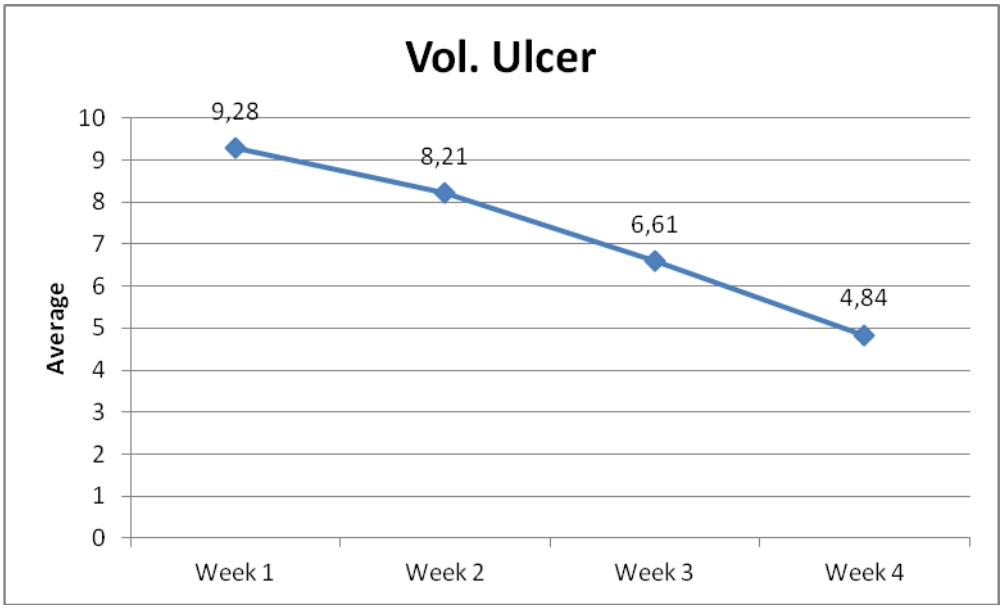

DISCUSSION

From the results of the study, 9 leprosy patients with pedis ulcers at Leprosy Donorejo Hospital Kelet, Jepara District within the period of study for 4 weeks of evaluation. Very little subject results are obtained, due to a large number of referral patients from various regions who require returning to their respective cities for further outpatient treatment at their respective homes.

The age of leprosy patients with pedis ulcers treated at Leprosy Hospital Donorejo Kelet, Jepara Regency is between the ages of 34-77 years. As for the distribution of sex more found in male patients (88.89%) than women (11.11%). This is following the results of research conducted by Muhammad Amri Rambey (2012) in Lamongan who said the results of the distribution of male sex were more at 1.9 times the risk of experiencing level 2 disability in the form of ulcers than the sex of female.[20]

Evaluation results every week in the form of measurement of the volume of leprosy pedis ulcer bahwa shows that the location of many pedis ulcers, in particular, is found in the forefoot.[10] This can be based on the function of the forefoot which is used as a footstool the body to stay balanced and upright when walking so that when there is a feeling of pain in the soles of the feet as a form of clinical leprosy and foot is still used to walk without using footwear, then will lead to a secondary disability in the form of pedis ulcer.

From the results of monitoring of ulcer volume for four weeks, a significant decrease was obtained in 9 study subjects. Wherefrom the statistical results using the Wilcoxon test data obtained; ulcer volume at week 4< ulcer volume at week 1, with an average volume decrease of -2,666 cm^3; where the value of p = 0.008 ($p<0.05$) is obtained.

All subjects received standard therapy in the form of 0.9% NaCl infusion to compress wounds, routine dressing changes and were given bioplacenton to speed up the process of wound healing. In some subjects, antibiotics were given in the form of metronidazole for wound with infection in the form of pus in the wound.

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Of the nine subjects, leprosy ulcer received therapy according to WHO standards, one of which required bed rest to reduce pressure on the soles of the feet, the goal of which is to heal the wound faster. This is also accompanied by the use of footwear for patients when walking, so that prevents the soles of the feet from being exposed to sharp objects and as a cushion when walking.

From the care guidelines that have been explained by WHO and the National Leprosy Control Program Handbook in the Leprosy Prevention and Management Section, the provision of care is still conventional and has been applied to services. This is the same as what was done at Leprosy Donorejo Hospital, Kelet District, Jepara. For 4 weeks the ulcer volume has been measured by looking at the patient's medical record by looking at what therapies have been obtained by the patient during treatment. Leprosy Donorejo Hospital Kelet Regency. Jepara as a hospital - specifically for leprosy, provides treatment for ulcers or pedis ulcers with bed rest that is done for 24 hours and is required to use footwear/crutches/wheelchairs if you want to move. Because these ulcers can heal if they don't get pressure and are left to rest with bed rest. Besides, the use of effective and appropriate dressing can be an important part of ensuring ulcer management. By maintaining the environmental humidity around the wound can provide several benefits including being able to prevent tissue dehydration and cell death, acceleration angiogenesis, and make it possible to interaction between growth factor with target cells. Giving antibiotics is also done by the hospital to patients who have an infection in the wound.

The process of wound healing in leprosy pedis ulcers can be affected by several factors, for example, a patient's history of smoking during treatment, age the patient, habit patients use footwear, bed rest, and the implementation of patient hygiene during treatment. Smoking can affect the wound healing process, due to the presence of toxin in the form of nicotine, carbon monoxide gas, and hydrogen cyanide which can be found in cigarette smoke. Nicotine is said to cause tissue hypoxia. Nicotine is a colored alkaloid that is easy to absorb during smoking causing vasoconstriction so that blood flow is reduced. Nicotine can stimulate the sympathetic nerve to release catecholamines which can trigger peripheral vasoconstriction so that tissue perfusion will decrease and inhibit the wound healing process.[22,23]

This study found 4 patients with leprosy pedis ulcers who smoked before treatment, and during treatment, there were still 4 patients who were still smoking. Of patients who were still actively smoking during treatment, the size of the wound narrowed which can be seen from H (horizontal length), v (vertical length), and the depth of the wound each decreased. From the results of the statistical test the T-test showed that the results were not significant ($p = 0.794$, $p > 0.05$) where there was no difference in the reduction in the volume of ulcers in patients who had the smoking habit and did not smoke.

Relationship between Age and Wound Size

The results of the study found 2 patients aged less than 45 years. From the two patients obtained a reduction in the size of the wound in terms of horizontal with a value of 0.8 to 2 cm, the vertical aspect decreased by 2 cm, and decreased in the depth of approximately 1 cm, greater than 7 patients in the age group more from 45 years with a horizontal length range of 0.5 to 1 cm, vertical length approximately 0.5, an average depth of 1 cm. These results are also following the statistical test using the T-test in which the mean reduction in the volume of pedis ulcer was greater in the age group

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with a range of 18-65 years compared with the age group 66-79 years. This is the same compared to the theory, where the age factor affects the wound healing process due to age affects the level of maturity and plays a role in physiological body functions such as in infants and the elderly. If in infants, the immune system is not yet mature, so the body's defense system in the face of invasion pathogens has not been adequate. Whereas in the elderly, it begins to experience a decline in function including an increasingly weak immune system causing the body to not be able to fight infections well. The wound healing process will take longer with age. This is due to the decreasing amount of elastin and the reduced collagen regeneration process due to decreased cellular metabolism. Skin cells also will experience a decrease in their elasticity due to vascularity of the skin which decreases and the reduction in fat glands which can cause skin elasticity to decrease. Skin that not elastic will reduce the ability of cell regeneration when the wound will and begin to close so it can slow down wound healing.[21,22]

Relationship of Hygiene with Wound Size

From the results of the study, it was found that the patient's hygiene was determined through filling in the questionnaire and monitoring every week, how regularly the wound was replaced with dressing, the use of footwear, and avoid from exposure dirt or water, use plastic wrapping on ulcer wounds when they want to perform MCK. 8 patients routinely kept the dressing clean every week and used footwear, and 1 patient who did not want to use footwear and rarely changed the dressing.[19,20]

From the results of the statistical tests above it can be concluded that there was a decrease in ulcer volume, both in patients who often maintain cleanliness and those who sometimes maintain wound hygiene. This is not appropriate in the Wound Care Association said that ulcer treatment is difficult to determine the estimated time in the healing process injuries because there are things that affect the length of time spent to perform care that is dressing changes, regularity and patient compliance in doing care, self-care for wounds, whether an infection is present or not. Compliance with established wound care schedule is one way to maintain a moist atmosphere on the skin, and for wounds that are too long wrapped and never replaced dressing can cause maceration on wounds and skin the area. As for the wound that is often replaced dressing can cause the effectiveness of topical therapy that is less than the maximum.[23]

CONCLUSIONS

The reduction in the volume of leprosy ulcers from weeks 1-4 has decreased significantly. Application of therapy in the treatment of leprosy pedis ulcers using conventional methods of dressing and bed rest in leprosy patients treated, as well as the use of pharmacological therapies in the form of 0.9% NaCl fluid, metronidazole infusion, sanoskin oxy, cutti cell, and bioplacenton. Several factors influence the decrease in pedis ulcer volume namely maintaining wound hygiene, use of footwear, and adequate nutrition.

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