

Physical deformity of leprosy patients in Dr. Moewardi General Hospital Surakarta: A retrospective study

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Abstract

Background The presence of physical deformities in patients with leprosy reflects the rate of disease transmission in the community, delay in detection, and ineffective treatment.

Methods This retrospective study was conducted using medical record data of leprosy patients visiting Dr. Moewardi General Hospital Surakarta from January 1, 2016, to December 31, 2019.

Results During the study period, there were 141 leprosy patients. The most common type of leprosy was lepromatous leprosy (46.7%), affecting 77 patients who also had physical deformities, which 12.9% of them were newly detected, 32.5% had the deformity during the treatment, and 54.5% after the treatment. Based on WHO disability grading, most of them were in grade 2, with the most affected area in hands (25.9%) in the form of finger deformity and claw hand followed by legs (22.1%) in the form of the ulcer; both legs and hands (15.6%) in the form of finger and toe deformity; face (5.2%) in the form of madarosis and nasal deformity; face, hand, and leg (1.3%). Most of these patients had no leprosy reaction (77.9%). The most common therapy given was MB MDT (90.9%).

Conclusion The majority of leprosy patients have physical deformities despite undergoing complete treatment. Therefore it is necessary to follow up with the patients regularly even after completing the therapy.

Key words

Deformities grade 2; Grade 2 disability; Leprosy; MB MDT.

Introduction

Leprosy or Morbus Hansen is a chronic infectious disease caused by infection with the *Mycobacterium leprae* (*M. leprae*) bacteria, mainly affecting the skin and peripheral nervous system.¹ Peripheral nerve damage appears as a direct result of nerve cell invasion by *Mycobacterium leprae*, as well as developing

immunological reactions causing deformity and physical disability if not diagnosed and treated promptly and appropriately.²

The World Health Organization (WHO) has declared leprosy a significant cause of morbidity due to long-term disability and sequelae.³ The prevalence of disability due to leprosy in 2015 was 211,973 in 108 countries.² India reported 645,000 leprosy patients with body deformities.² Around 33-56% of new leprosy patients had impaired nerve function, and 25-30% of leprosy cases had body deformities.⁴ Brazil (2017) reported the prevalence of new leprosy cases

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with disability at 8.3% or 9.39 per 1 million population.⁵ The number of leprosy cases in Indonesia ranks third after India and Brazil. In 2017, there were more than 14,000 (8%) new cases of leprosy with disabilities in Indonesia.⁶

The clinical symptoms of leprosy are sometimes atypical.⁷ This causes a delay in diagnosis, which can lead to *deformity* and *disability*.⁸ Loss of sensory function is a cause of repetitive injury, ulceration, and shortening of the limbs. Loss of corneal sensation can cause corneal injury and result in blindness. Loss of motor function causes claw hands, failure to close eyes (lagophthalmos), and wrist and foot drop.⁹

Disability assessment is critical not only to evaluate the effectiveness of control programs but also beneficial for sufferers in preventing deformities and stigma experienced by leprosy sufferers. The WHO program aims to reduce the disability of leprosy to a target of less than 1 per million population by strengthening strategies for preventing and reducing deformities.¹⁰ Despite curative antibacterial treatment, a quarter to a third of patients experience permanent neurologic deficits and disabilities.¹

Based on the background above, research on the profile of leprosy disability needs to be carried out. This study aims to find out the profile of deformities or physical disabilities of leprosy patients to achieve optimal management for the following leprosy patients in Dr. Moewardi General Hospital Surakarta.

Methods

This research is retrospective descriptive. The study samples were obtained from subjects who met the inclusion and exclusion criteria using total sampling technique. The study subjects who met the inclusion criteria included all

leprosy patients with disabilities treated at the Dr. Moewardi General Hospital Surakarta, obtained from the patient's medical records from January 1, 2016, to December 31, 2019. The exclusion criteria included all leprosy patients with disabilities with incomplete or illegible medical records. Variable data used in this study were a profile of leprosy disability, including location, degree of disability, type of disability, treatment status, age, sex, occupation, initial symptoms, bacterial index, type of leprosy, type of treatment, and leprosy reactions.

Results

We found 141 people with leprosy within four years and 77 people with leprosy with disabilities. For leprosy with disability, newly detected cases (12.9%), under therapy (32.5%), and completed treatment (54.5%). The most frequent findings were age group >60 years (26%), male (72.7%), farmer (41.5%), the majority of early symptoms of reddish spots (63.6%), bacteria index +3 and +4 (44.2%), and *lepromatous leprosy* type (46.7%). Treatment mostly used MB MDT (90.9%). Most leprosy patients with disability did not experience leprosy reactions (77.9%) (**Table 1**). Based on WHO disability grading, the majority of patients had grade 2 disabilities (70.1%). The most common location was on the hand (25.9%), with the most common types of defects being finger deformities (11.6%) and claw hand (7.8%). Followed by feet (22.1%) as ulceration (12.9%); hands and feet (15.6%) as hand and foot deformities (11.6%); face and eyes (5.2%) as madarosis (2.6%) and nasal deformities (2.6%); and face, hands, and feet (1.3%) (**Table 2**).

Discussion

Disability in leprosy patients can occur during or after treatment is considered completed or known as released from treatment (RFT). This

Table 1 Distribution of leprosy patients with disability based on age and gender.

| Characteristics | Total (n=77) | (100%) |
|--------------------------------------|-----------------|--------|
| Age | | |
| 0 – 9 | 0 | 0 |
| 10 – 19 | 03 | 3.9 |
| 20 – 29 | 09 | 11.7 |
| 30 – 39 | 18 | 23.4 |
| 40 – 49 | 15 | 19.3 |
| 50 – 59 | 12 | 15.6 |
| >60 years old | 20 | 26 |
| Gender | | |
| Male | 56 | 72.7 |
| Female | 21 | 27.3 |
| Occupation | | |
| Government employee | 2 | 2.6 |
| Private Employee | 12 | 15.6 |
| Farmer | 32 | 41.5 |
| Labour | 14 | 18.2 |
| Housewife | 17 | 22.1 |
| Student | 0 | 0 |
| Early Symptoms | | |
| White Spots | 4 | 5.2 |
| Red Spots | 49 | 63.6 |
| Lumps (nodules) | 1 | 1.2 |
| Ulcers/wounds/ulcers | 11 | 14.3 |
| Dry Skin | 1 | 1.3 |
| Numbness in hands/feet | 3 | 3.9 |
| Hand/foot joint pain | 6 | 7.8 |
| Tingling | 2 | 2.5 |
| Bacterial Index | | |
| Negative | 13 | 16.9 |
| +1 or +2 | 30 | 38.9 |
| +3 or +4 | 34 | 44.2 |
| Leprosy Type (Ridley Jopling) | | |
| LL | 36 | 46.7 |
| BL | 21 | 27.3 |
| BB | 8 | 10.4 |
| BT | 11 | 14.3 |
| TT | 1 | 1.3 |
| Types of Treatment | | |
| PB MDT | 7 | 9.1 |
| MB MDT | 70 | 90.9 |
| Reaction | | |
| Reversal reaction | 2 | 2.6 |
| Erythema nodosum leprosum | 15 | 19.5 |
| None | 60 | 77.9 |
| Current treatment Status | | |
| New | 10 | 12.9 |
| In Therapy | 25 | 32.4 |
| RFT | 42 | 54.5 |

risk is decreased after three years of finishing treatment.¹¹ Ranjan S (2013) reported 150 leprosy patients, with 93 people (62%) having disabilities, with the number of new patients of 57.97%.¹¹ The high proportion of disability at the initial diagnosis indicates the possibility of delay in diagnosis.¹² The Nayak study (India) in 2017 reported as many as 92 cases of leprosy disability; 74% were newly detected cases, 14% were undergoing treatment, and 12% had already completed treatment. Treatment was provided using MB MDT (91.13%) and PB MDT (8.87%). Most patients were treated with MB MDT to provide some prophylaxis effects on the development of deformity. Significant reduction in physical disability after leprosy therapy showed the effectiveness of leprosy therapy in reducing the disability of leprosy patients. Research by Van Brakel (2012) in Indonesia mentioned that there were new leprosy patients with 62% of them having disabilities, 59% in the treatment, and 39% in their five years after completion of treatment. This finding showed that the sequelae in leprosy patients can still occur after the patient is declared RFT and is not monitored by health services.¹² A total of 141 leprosy cases reported in this study comprised 64 leprosy patients without disabilities and 77 leprosy patients with disabilities. There were 10 leprosy patients with disabilities (12.9%), 25 newly detected cases (32.5%) that were patients undergoing treatment, and 42 patients (54.5%) that were patients who had completed treatment. The treatment given to leprosy patients with disabilities at our place was 70 people (90.9%) who received MB MDT regimen treatment.

The incidence of male leprosy patients is almost twice more likely to experience disability than female patients. This sex difference was associated with social behavior and reluctance to access health services.³ In India (2018), there were 123 lepers, and 82 (66.67%) were males.¹³

Table 2 Location, types of leprosy disability.

| <i>Distribution, types of leprosy disability</i> | <i>Total (n=77)</i> | <i>%</i> |
|--|---------------------|----------|
| Hand | | |
| Hypothenar muscle atrophy | 9 | 11.7 |
| Anesthesia | 4 | 5.2 |
| Joint weakness or pain | 2 | 2.6 |
| Ulcer | 3 | 3.9 |
| Claw hand | 6 | 7.8 |
| Finger deformity (absorption, mutilation, contracture) | 9 | 11.6 |
| Foot | | |
| Anesthesia | 4 | 5.2 |
| Posterior tibial thickening | 2 | 2.6 |
| Finger deformity (absorption, mutilation, contracture) | 1 | 1.3 |
| Joint weakness or pain | 6 | 7.8 |
| Ulcer | 10 | 12.9 |
| Eyes and face | | |
| <i>Madarosis</i> | 2 | 2.6 |
| Blurred Vision | 4 | 5.2 |
| <i>Nasal deformity</i> | 2 | 2.6 |
| Hands and feet | | |
| <i>Claw hand</i> and foot ulcers | 1 | 1.3 |
| <i>Claw hand</i> and drop <i>Foot</i> | 1 | 1.3 |
| Hand and foot ulcers | 1 | 1.3 |
| Deformity of hands and feet | 9 | 11.6 |
| Eyes, hands, and feet | | |
| <i>Madarosis</i> , blurred eyes, claw hand, foot ulcer | 1 | 1.3 |

The study results of leprosy patients with disabilities showed that it frequently occurred in males, with 56 people (72.7%). Physical conditions and decreased organ function in the elderly are the risk factors for progressive and irreversible disability. Nayak's study in India reported that most disabilities in leprosy patients were in the age group of 41-50 years (27.2%), and there was no disability in leprosy patients aged 1-20 years.¹³ Our study found that leprosy patients with disabilities were mostly in the age group >60 years, with a total of 20 people (26%), and no disability was found at the age of 0-9 years. The disability rate in leprosy patients is higher in patients with heavy physical work, especially works requiring extensive use of hands and feet. Brakel and Kaur (2002) stated that from the types of work, lepers who experienced the most significant disability were farmers (35%).¹² In our study, most disabilities in leprosy patients were found in those working as farmers. According to WHO, the symptoms and signs of leprosy are one or more signs, such

as hypopigmented patches on the skin or redness, loss of sensation or numbness, thickening of the nerves with sensory disturbances, skin smears revealing acid-fast bacilli.¹⁰ India reported that the initial symptom most commonly found in leprosy patients with disabilities was white spots on the skin.¹³ In our study, the most common initial complaints experienced by leprosy patients with disabilities were reddish spots in 49 patients (63.6%), with bacterial index most commonly of +3 or +4 in 34 patients (44.2%).

Multibacillary patients tend to have a more significant amount of nerve damage resulting in disability.¹⁴ One study (Hidyanara, 2018) states that patients with multibacillary leprosy (MB) tend to experience disability.³ In Lepromatous Leprosy (LL) type leprosy, peripheral nerve damage progresses slowly over the years, where extensive fibrosis replaces nerve axons. Patients with LL have a 5-12 times greater chance of disability.³ Based on this study's results, most

leprosy patients with disabilities were LL type 36 (47.7%) and BL type 21 (27.3%).

Leprosy reaction can result in peripheral nerve damage with impaired function.¹⁰ Patients without leprosy reactions also often experience disabilities because they ignore or misinterpret the symptoms, causing delays in visiting healthcare facility after significant nerve damage has occurred and developed into disabilities.¹⁴ The study found that most lepers with disabilities did not experience leprosy reactions 60 (77.9%).

Deformities in leprosy patients include anesthesia, skin dryness, muscle paralysis and atrophy, ulceration, scar formation, and secondary infection. The WHO disability assessment in 1998 was classified into three groups: grade 0 if there is normal sensation and no visible impairments; grade 1 if there is impaired sensation and no visible impairments; grade 2 if there is a decrease in function, including ulcers, atrophy and muscle weakness, contractures, and mutilations.¹⁰ From 50 leprosy patients that came to Dermatology Venereology and Leprology outpatient department in Bangalore Hospital, 37 patients (74%) had grade 2 abnormalities, and 13 (26%) had grade 1 abnormalities. The proportion of cases in grade 1 disability in the study for anesthesia was 24% (12 patients), 6% (3 patients) for lagophthalmos, 4% for corneal abnormalities, 2% for madarosis, 2% for leonine facies, 2% for early senility, and 2% for auricular defects. Meanwhile, the types of deformities of the hands in the study showed that 19 patients (38%) had more claw hands than other hand deformities. Ulcers on the hands of 50 patients, 19 (38%), 4% had finger abnormalities, 16% had finger amputation, 2% had foot abnormalities, and the drop foot was found in only one patient. Sensory function deficits were more often seen in patients of lepromatous type.¹³ Based on WHO disability

grading in this study, there were (23/29. 8%) grade 1 disability, and the majority of patients (54/70.1%) had grade 2 disability. Grade 2 disability were most commonly found on the hands (20/25.9%), with the most common types of finger deformities being resorption, mutilation, and contracture (9/11. 6%) and claw hand (6/7.8%). Followed by grade 2 disability on the feet (17/22.1%), with the most common types of disability being ulcers (10/12.9%), grade 2 disability on the hands and feet (12/15.6%) with the most common types being hand and foot deformities (9/11.6%), on the face and eyes (4/5.2%) with madarosis (2/2.6%) and nasal deformities (2/2.6%), and on the face, hands, and feet (1/1.3%).

Conclusion

There were 141 leprosy patients for January 1, 2016, to December 31, 2019, treated at the Dermatology and Venereology Department of Dr. Moewardi General Hospital Surakarta. More than half of the leprosy patients experienced deformities and disabilities (77 people). Many disabilities occur after therapy is declared completed. Most of the therapy given was MB MDT. Disability in leprosy often occurs in males with age >60 years. The initial symptoms mainly were red spots, a type of *lepromatous leprosy*, farmer occupation, the highest level of disability was in the grade 2 disability, and the location on the hand with the most type of disability was deformity of the fingers. Most leprosy patients with disability did not experience leprosy reactions. It is highly recommended to continue to follow up with leprosy patients even after completing the administration of MDT to prevent physical deformity.

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