

Original article

Deformity and disability index in patients with leprosy

Muhammad Luqman Ahmad, Muhammad Saleem Khan, Ijaz Hussain, Atif Hasnain Kazmi

Department of Dermatology Unit I, King Edward Medical College/Mayo Hospital, Lahore.

Abstract *Background* Leprosy continues to be a serious challenge in most of the developing countries, contributing significantly to the physical and social disability of the patients afflicted.

Objectives The aim of this study was to estimate the disability rate in patients of leprosy.

Patients and methods This study of deformities and disabilities in leprosy was conducted on 100 diagnosed cases of leprosy (70 males and 30 females), aged 9-70 years. Forty one percent of the cases (32% males and 9% females), were found to have various deformities and disabilities. The deformity and disability rate was higher in males than in females and it was positively associated with increasing age and duration of the disease. The disability rate was much higher in patients with multibacillary leprosy (42.5%) than in paucibacillary leprosy (23.7%), the highest being in lepromatous leprosy patients (68.5%).

Results Hands were affected most frequently (32%) followed by feet (30%) and eyes (16%). The most commonly found deformities and disabilities were anesthesia of hands and feet, claw hands, resorption of toes and plantar ulcers. According to WHO disability grading, 59% of the patients had no disability, 10% had grade 1 and 31% had grade 2 disability.

Conclusions Disability assessment is very important not only to evaluate the effectiveness of the leprosy control programs but also for the patients whose important worry is the stigmatizing deformities caused by the disease. The earlier detection of sensory loss might reduce these secondary deformities.

Key words Leprosy, disability.

Introduction

Leprosy is a chronic infectious granulomatous disease of human beings caused by *Mycobacterium leprae*. It presents with a spectrum of clinical features ranging from tuberculoid (TT) to borderline tuberculoid (BT), mid-borderline (BB), borderline lepromatous (BL) and lepromatous leprosy (LL).¹ The predilection of *M. leprae* for cooler parts of the body results in a characteristic

clinical picture with the skin, nasal mucosa, testes, eyes and superficial nerves being the major organs affected.² If it were not for disabilities, leprosy would not receive as much attention as it does. Approximately 25% of the patients, who are not treated at an early stage of the disease, develop various deformities and disabilities which can leave a permanent mark on the patients resulting in strong social stigma.²⁻⁴

Two types of deformities are encountered in leprosy patients; primary deformities are due to direct involvement of the tissues

Address for Correspondence

Dr. Muhammad Luqman Ahmed,
E-366/B, St#11, Block B, Nishat Colony,
Lahore Cantt.
Ph# 042 5745637

and peripheral nerves with *M. leprae* causing sensory loss and/or motor paralysis while secondary deformities occur as a result of damage to the anesthetic parts of the body.⁵

The disability rate is much higher in patients with multibacillary leprosy than in paucibacillary leprosy, in males than in females and it increases with increasing age and duration of the disease.⁵ Early diagnosis of leprosy and treatment with multidrug therapy (MDT) is the most effective means of preventing disabilities⁶ as chemotherapeutic measures will never restore the function of peripheral nerves once they have been damaged by the disease.^{7,8} Leprosy is still one of our major health problems. A considerable number of patients are not diagnosed at an early stage of the disease and many of those who are diagnosed, keep away from leprosy centres because of fear, shame and stigma associated with the disease. That is why deformities and disabilities are common in leprosy patients.

This study was planned to assess various aspects of deformities and disabilities in leprosy in our patients.

Patients and methods

This study was conducted at Rawalpindi Leprosy Hospital, Rawalpindi and Leprosy Centre, Mayo Hospital, Lahore. One hundred, retrospective and prospective, diagnosed cases of leprosy were included in the study.

Patients of any age and either sex, suffering from any type and duration of the disease, were enrolled. Diagnosis was based on a detailed history, clinical examination, slit skin smear examination for AFBs and histopathological

Table 1 WHO Disability Grading (1988) [5]

Grade	Hands and Feet	Eyes
Grade-0	No anesthesia No visible deformity or damage	No eye problems due to leprosy No evidence of visual impairment
Grade-1	Anesthesia present No visible deformity or damage	Eye problems due to leprosy present but vision not severely affected
Grade-2	Visible deformity or damage present	Severe visual impairment

examination of skin biopsies.

Every patient had a physical examination and assessment which entailed examination of face, hands and feet. The eye examination involved tests for corneal sensation and closure of eyes. The hands were examined for anesthesia, ulceration, contractures, resorption of digits, claw hand, wrist drop and muscle weakness. The feet were examined and information recorded about plantar sensations, claw toes, foot ulcers, resorption of digits, foot drop and contractures.

Various deformities and disabilities found in each patient were recorded on a specially designed pro forma and grading of disabilities was done according to WHO disability grading criteria (**Table 1**).⁵

Chi-square test at 95% confidence interval was used for statistical evaluation. A *p* value of <0.05 was considered significant.

Results

One hundred leprosy cases were enrolled in the present study. There were 70 males and 30 females. Their

ages ranged between 9 and 70 years with an average of 39.7 years.

Out of 100 cases, 41 were found to have various deformities and disabilities. Hands were involved in 32%, feet in 30% while eyes were affected in 16% cases. The older the patient, the more frequent were disabilities, 41-60 years age group was the most affected. Males were more commonly affected (32 out of 70) with deformities and disabilities than females (9 out of 30) [$p < 0.05$].

The deformity and disability rate increased with the increasing duration of the disease. Patients, who had the disease for more than 10 years, were maximally affected (83.3%).

The frequency of deformities and disabilities in different types of leprosy, are given in **Table 2**. It was the highest in LL group (68.5%). Multibacillary cases (42.5%) were more frequently affected with deformities and disabilities than paucibacillary cases (21.4%).

Different deformities and disabilities of hands, feet and eyes are depicted in **Table 3**. Hands were affected in 32 cases (26 males and 6 females). Anesthesia, claw hands, weakness and resorption of fingers were most frequently noticed deformities and disabilities in hands. Thirty patients (24 males and 6 females) had feet involvement in the form of anesthesia, resorption of toes, ulcers, weakness, contractures, claw toes and foot drop. Eye involvement was present in 16% of cases with corneal anesthesia, blurring of vision, madarosis and lagophthalmos being the

Table 2 Deformities/disabilities and types of leprosy (n=100)

Type of leprosy	No. of cases	Disabled n (%)
Tuberculoid	4	0
Borderline tuberculoid	38	9 (23.7%)
<i>Total paucibacillary cases</i>	42	9 (21.4%)
Midborderline	5	1 (20.0%)
Borderline lepromatous	18	7 (38.9%)
Lepromatous	35	24 (68.5%)
<i>Total multibacillary cases</i>	58	32 (42.5%)

Table 3 Deformities/disabilities of hands, feet and eyes (n = 100)

Deformity/disability	Male	Female	Total
<i>Hands</i>			
Anesthesia	21	2	23
Claw hand	17	1	18
Weakness	9	3	12
Resorption of fingers	6	1	7
Contractures	4	1	5
Ulceration	3	0	3
Wrist drop	1	0	1
<i>Feet</i>			
Anesthesia	22	4	26
Resorption of toes	10	3	13
Weakness	8	4	12
Ulcers	6	2	8
Claw toes	3	0	3
Foot drop	2	0	2
<i>Eyes</i>			
Corneal anesthesia	6	2	8
Blurring vision	6	1	7
Madarosis	4	2	6
Lagophthalmos	4	1	5
Ectropion	3	0	3
Marked visual loss	2	0	2

most frequently encountered findings. Hands and feet were affected more frequently as compared to eyes ($p < 0.05$).

Miscellaneous deformities and disabilities noted in 10 patients (8 males 2 females), included hanging ear lobes (6%), collapsed nose (5%), nasal septal perforation (2%) and leonine facies (1%).

Table 4 Disability/deformity grading in paucibacillary (PB) and multibacillary (MB) patients (n = 100)

Grade	PB	MB	Total
0	34	25	59
1	4	6	10
2	4	27	31
Total	42	58	100

Table 4 shows the proportion of grade 0, 1 and 2 disabilities among 41 disabled leprosy patients. Grade 2 disabilities were found more frequently (31 out of 100) than grade 1 disabilities (10 out of 100). The difference is statistically significant ($p < 0.05$). Multibacillary patients had more grade 2 disabilities than paucibacillary patients.

Discussion

Deformities and disabilities constitute a very important aspect of leprosy. Much of the fear, shame and social stigma associated with the disease, is related to the mutilating deformities that it causes. The objective of the present study was to determine the magnitude of various deformities and disabilities in our leprosy patients.

The study was conducted in one hundred, diagnosed cases of leprosy (70 males and 30 females). 41% of the cases (32% males and 9% females) had one or more deformities and disabilities. There has been wide variation in the reported rates of deformities and disabilities in various studies ranging from 7.6% in Cameroon and 23.4% in Nigeria to 48.7% in Burma and 80% in Taiwan.⁶

The results of present study (41%) are comparable to that reported by Iyere (38.8%) in Nigeria⁹ and Schipper *et al.*⁵ (36.9%) in Eastern Nepal.

Goucheng *et al.*⁴ reported higher disability rates (57%) in their study, while lower rates have been reported in various other studies.^{5,6,10} Perhaps the assessments were made in different situations or criteria of disability grading and samples used for studies were different.

The disability rate is more in older age groups. In the age groups 41-60, >60 and 21-40, the prevalence of deformities and disabilities was very high (54.54%, 44.44% and 35.84%, respectively). This is similar to the results of Ponnighaus *et al.*⁶ This might be due to chronicity of the disease, late diagnosis and treatment and lowered immune status in the older age group.

In the present study, the disability rate in males is higher (45.7%) than in females (30%). This agrees with the data of Iyere⁹ and Htoon.⁸ The increased disability rate in males is probably related to their outdoor working routine and exposure to various environmental insults resulting in injuries to hands and feet, which if neglected, can lead to various complications.

Our data suggests that patients with lepromatous type of leprosy were more prone to develop deformities and disabilities than those with borderline type. The difference of disability rate between PB and MB leprosy is statistically significant ($p < 0.05$). The findings are similar to those reported by Goucheng *et al.*⁴ and Tiendrebeogo *et al.*¹¹

It was observed that the disability rate increased with increasing duration of the disease. Patients having the disease for more than ten years, had much higher disability rate (83.3%) than those with disease duration of less than a year (25%).

This observation is consistent with that of Htoon⁸, Ponnighaus⁶ and Goucheng *et al.*⁴

Hands were affected most frequently (32%) followed by feet (30%) and eyes (16%). These findings are consistent with those of Tiendrebeogo *et al.*¹¹

Anesthesia of hands and feet, claw hand, resorption of toes and foot ulcers were the most frequently detected deformities and disabilities in our study. In another study conducted in Nigeria, Iyere⁹ found sensory loss of palms and soles, claw hands and plantar and palmar ulcers as the most frequently observed deformities.

Eye involvement was observed in 16% of cases. Corneal anesthesia was the most common disability detected followed by blurring of vision, madarosis, lagophthalmos and ectropion. In other studies by Schipper *et al.*⁵ and Goucheng *et al.*⁴ lagophthalmos was seen more frequently as compared to corneal insensitivity and blurring of vision.

Different facial deformities were also observed in this study, like collapsed nose, hanging ear lobes, nasal septal perforation and leonine facies. All these deformities were present in cases of lepromatous leprosy. The incidence of facial deformities was low as compared to hands and feet and corresponded to the observation made by Goucheng *et al.*⁴

According to WHO disability grading criteria, 59% of the patients had no disability, 10% had grade 1 and 31% had grade 2 disability. Grade 2 disabilities were more frequently observed than grade 1 ($p < 0.05$).

Grade 2 disabilities were more common in multibacillary (46.5%) than paucibacillary

group (9.5%), while grade 1 disabilities in both groups were comparable (10.3% and 9.5% respectively). The increased grade 2 disability rate in multibacillary group is likely to be due to prolonged duration of the disease in this group, late diagnosis, inadequate treatment and poor self-care on part of the patients. Schipper *et al.*⁵ also found higher grade 2 disability rate in MB (37.2%) than PB patients (14%).

The present study shows that a fairly large number of leprosy patients in our population have some sort of deformity or disability. The possible reasons include delay in diagnosis and treatment, poor compliance with treatment and poor self care by patients. Therefore, efforts must be directed towards early diagnosis of the disease, adequate management and proper health education of these patients in order to minimize the incidence of deformities and disabilities. Moreover, stress should be given towards appropriate rehabilitation of patients who get deformed or disabled as a result of leprosy.

Conclusion

Deformities and disabilities are fairly common in our leprosy patients. Deformity and disability rate is higher in males than in females and it increases with increasing age of the patients and duration of the disease. Anesthesia of hands and feet, claw hand, resorption of toes and foot ulcers are the most frequently detected deformities and disabilities. Proportion of grade 2 disabilities is much higher than grade 1 disabilities.

References

1. Bryceson A, Pfaltzgraff RE, eds. *Leprosy, 1st edn*. New York: Churchill Livingstone; 1990.
2. Gilbody JS. Aspects of rehabilitation in leprosy. *Int J Lepr* 1992; **60**: 608-40.
3. Ladhani S. Leprosy disabilities: The impact of multidrug therapy (MDT). *Int J Dermatol* 1997; **36**: 561-72.
4. Goucheng Z, Wenzhong L, Lingbin Y. An epidemiological survey of deformities and disabilities among 14257 cases of leprosy in eleven countries. *Lepr Rev* 1993; **64**: 143-49.
5. Schipper A, Lubbers WJ, Hogeweg M. Disabilities of hands, feet and eyes in newly diagnosed leprosy patients in Eastern Nepal. *Lepr Rev* 1994; **65**: 239-47.
6. Ponnighaus ITA, Boerrigter G, Fine PEM, Rusel J. Disabilities in leprosy patients as ascertained in a total population survey in Koronga District, Northern Malawi. *Lepr Rev* 1990; **61**: 366-74.
7. Smith WCS, Brakel WH. Research needs related to disabilities and rehabilitation. *Int J Lepr* 1996; **64**: S52-4.
8. Htoon MT. Disabilities among rural leprosy patients in Myanmar. *Int J Lepr* 1994; **62**: 126-9.
9. Iyere BB. Leprosy deformities: Experience in Molai Leprosy Hospital, Maiduguri, Nigeria. *Lepr Rev* 1990; **61**: 171-9.
10. Lechat MF. Predicting trends. *Int J Lepr* 1996; **64**: S38-43.
11. Tiendrebeogo A, Toure I, Zerbo PJ. A survey of leprosy impairments and disabilities among patients treated by MDT in Burkine Faso. *Int J Lepr* 1996; **64**: 15-25.

