

# A retrospective study of disability profile of live leprosy patients in a district of Maharashtra

Jayashree D Naik<sup>1</sup>, Sandesh V Kamble<sup>1</sup>, Swapnil R Jain<sup>1</sup>, Madhuri P Mathurkar<sup>1</sup>, Jitendra R Dolare<sup>2</sup>, Vivek Patil<sup>1</sup>

<sup>1</sup>Department of Community Medicine, Government Medical College, Miraj, Maharashtra, India.

<sup>2</sup>State Epidemic Medical Officer, Joint Director Health Services, Pune, Maharashtra, India.

Correspondence to: Swapnil R Jain, E-mail: sjvicky85@gmail.com

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## Abstract

**Background:** Globally, by 2000, leprosy was eradicated; however, it still persists to be the major reason of peripheral neuropathy, disability, and disfigurement in few developing countries. The problem of disabilities assumes increasing importance not only in terms of evolving better methods of treatment, correction of deformities, and rehabilitation of the disabled but also with regard to better medical management of patients under antileprosy therapy.

**Objective:** To assess sociodemographic characteristics of live leprosy patients with disability, to determine grade and pattern of disability in them, and to find association between them.

**Materials and Methods:** This was a retrospective descriptive–analytic study, which included records of all registered live leprosy patients with disability from 1971 to 2014. The records of diagnosed patients were obtained from Office of ADHS leprosy, Sangli, Maharashtra, India.

**Result:** A total of 1,213 patients with deformities were analyzed, among which 62.73% were male and 37.27% female subjects, and 37.5% were in geriatric age group. Majority of the patients [1,176 (96.9%)] belonged to multibacillary (MB) group. Frequency of disability was more in MB leprosy than in paucibacillary patients. Grade 1 disability (loss of sensations) was seen in majority [663 (54.7%)] of cases. Most common disability among study subjects was anesthesia of palm.

**Conclusion:** Proportion of disabilities in the leprosy patients was higher, which might have been because of delay in referring to health-care centers, incomplete treatment course, and having no access to medical centers in the past.


**KEY WORDS:** disability, leprosy, multibacillary, paucibacillary, deformity, claw hand

## Introduction

Leprosy also known as Hansen's disease, named after a Norwegian physician Gerhard Henrik Armauer Hansen who identified the causative organism in 1873, is a skin and nerve infection caused by *Mycobacterium leprae*. From the time

of biblical era, the disease sustains to be a chief reason of peripheral neuropathy, disability, and disfigurement.<sup>[1]</sup> It accounts for about 66.21% of the worldwide prevalence in the South East Asian region and 71% of all freshly identified cases at the end of first quarter of 2013.<sup>[2]</sup> Globally, in 2011, 219,075 fresh leprosy cases were recorded, of whom 127,295 were in India. Of these freshly detected cases in India, about 3% show grade 2 disability, pertaining to the occurrence of visible (and often permanent) deformity. It has been established that, in 2015, grade 2 disability owing to leprosy will be seen in nearly 500,000 people living in India.<sup>[3]</sup>

The WHO's three-grade disability grading system (0, 1, and 2) is being used for numerous years and has been established to be a good basis for estimating the extent of the problem and organizing activities of physical rehabilitation at both the individual and community levels.<sup>[4]</sup> In 2009, the WHO

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launched the Enhanced Global Strategy for Further Reducing the Disease Burden due to Leprosy for 2011–2015, under which the target became to reduce the number of new cases of leprosy with G2D per 100,000 total population (G2DR) by at least 35% between the end of 2010 and the end of 2015.<sup>[6]</sup> Stoppage of disabilities starts with early detection of leprosy, recognition, and treatment of difficulties such as neuritis and reactions, finding of at-risk patients of emerging secondary disability, and well-timed intervention.<sup>[4]</sup>

The National Leprosy Control Program was launched in 1954 in India and converted to National Leprosy Elimination Program (NLEP) in 1983 with the objective to eliminate leprosy.<sup>[2]</sup> A Simplified Information System (SIS) introduction for NLEP appropriate for the General Health Service officials aided in rationalizing data generation, reporting, and monitoring of the program.<sup>[6]</sup> This study has been under taken with aim to assess sociodemographic characteristics of live leprosy patients with disability, to determine grade and pattern of disability in them, and to find association between them.

## Materials and Methods

This was an analytical study that included already diagnosed live leprosy patients with disability. The records of diagnosed patients from year 1971 to 2014 were obtained from Office of Additional District Health services (ADHS) leprosy Sangli, Maharashtra, India, after prior permission. Only live leprosy cases were included in study. Obtained secondary data of patients were reviewed, and relevant information was collected. The types of leprosy [multibacillary (MB) and paucibacillary (PB)] and grades of disabilities according to the WHO protocol were determined.<sup>[4]</sup>

## Results

A total 1,213 patients with deformities/disabilities were analyzed, among which 62.73% were male and 37.27% female subjects. Majority (60.69%) were aged between 19 and 60 years, while only 0.58% were less than or equal to 14 years of age. Majority of patients [1,176 (96.9%)] belonged to MB group, while 37 (3.0%) were PB cases. Among all patients, majority [871 (71.8%)] were from rural area, while only 28.2% were belonging to urban area. Majority (88%) of the cases were cured at the time of study period [Table 1].

Grade 1 disability (loss of sensations) was seen in 663 (54.7%) cases, while grade 2 disability (deformity) was seen in 550 (45.3%) cases. Age group of patients, sex, and residence was significantly associated with grades of disability, while type of leprosy was not significantly associated with grades of disability. Disability was more severe in MB leprosy than in PB patients, although it was not significant. Prevalence of disability (both grades 1 and 2) was more in male than in female subjects and was significantly associated with male sex [Table 2].

Hands were the most common site involved, followed by feet and eyes; disability of any type was proportionately more in female when compared with male subjects although difference was not statistically significant. Anesthesia in palm was the most commonly involved disability: 78.5% among disabilities of all types. But, anesthesia sole was the most common involved disability among disability in feet; with regard to disabilities in eyes, lagophthalmos was the most common one, i.e., present in 69% of cases. Claw hand was seen in 432 (35.6%) of cases [Table 3]. Table 4 clearly depicts that disability in all sites was more common in MB than PB subjects.

## Discussion

Majority of patients [1,176 (96.9%)] belonged to MB group, while 37(3.0%) were PB cases, similar to that well-documented in previous study by Jain *et al.*,<sup>[2]</sup> where majority of patient [173 (56.9%)] belonged to MB group, while 131 (43.1%) were PB cases, whereas Chaitra *et al.*<sup>[7]</sup> in their study among children under 14 years of age revealed that, majority (75%) of the children formed the PB group, making the remainder 25% MB. Majority (60.69%) cases were aged between 19 and 60 years, but Jain *et al.*<sup>[2]</sup> found that majority of cases (36.8%) belonged to 15–30 years. Probably, a relatively long incubation period of leprosy may be one of the causes for higher occurrence of leprosy in latter part of life in this study. Among all patients, majority [871 (71.8%)] were from rural area, which is similar to the study by Asia *et al.*,<sup>[8]</sup> where 61.7% were from rural areas [Table 1].

Severity of disability was more in MB than in PB cases as well-documented in previous studies by Asia *et al.*<sup>[8]</sup> and Schipper and Lubbers.<sup>[9]</sup> Our study concludes that frequency of disability in leprosy patients was more in MB cases but there was no significant association between type of leprosy and grades of disability, while Sarkar *et al.*<sup>[10]</sup> found that patients with more than five skin lesions also showed more disability than patients with  $\leq 5$  lesions. These findings were also statistically significant ( $P < 0.001$ ). There was a significant relation between disabilities and type of leprosy ( $P < 0.05$ ), but no relation was observed between disabilities and gender or residential areas in a study in Iran by Rad *et al.*<sup>[11]</sup> Moreover, in a study by Chavan *et al.*,<sup>[12]</sup> it was found that disability rate was higher in MB leprosy patients ( $P < 0.001$ ). Age was not significantly associated with grade of disability in the study by Sarkar *et al.*,<sup>[10]</sup> which is in contrast to our study. Grade of disability was more significantly associated with male sex in current study, similar to that reported by Sarkar *et al.*<sup>[10]</sup> This study showed that majority of patients showed grade 1 disability [loss of sensations; 663(54.7%)] cases, while grade 2 disability (deformity) was seen in 550 (45.3%) cases, which is contradictory to that reported by Asia *et al.*<sup>[8]</sup> In their study, they found that grade 2 disability (deformity) was seen in majority [95 (58.4%)] of cases and grade 1 deformity (loss of sensations) was seen in 67 (41.3%) cases [Table 2].

**Table 1:** Distribution of live leprosy patients with disabilities according to study variables

Study variables	Category	Type of leprosy		Total
		Multibacillary (%)	Paucibacillary (%)	
Age at the time of diagnosis (years)	0–14	7 (0.58)	0 (0)	7 (0.58)
	>14–19	14 (1.15)	1 (0.08)	15 (1.23)
	>19–60	706 (58.19)	30 (2.47)	736 (60.69)
	>60	449 (37.01)	6 (0.49)	455 (37.5)
Gender	Male	743 (61.25)	18 (1.48)	761 (62.73)
	Female	433 (35.69)	19 (1.58)	452 (37.27)
Residence	Urban	334 (27.5)	8 (0.7)	342 (28.2)
	Rural	842 (69.4)	29 (2.4)	871 (71.8)
Case status	Active	142 (12.1)	3 (8.1)	145 (12.0)
	Cured	1,034 (87.9)	34 (91.9)	1,068 (88.0)
Total		1,176 (100)	37 (100)	1,213 (100)

Figures in parenthesis denote percentages.

**Table 2:** Association between grade of disability and study variables

Study variable	Category	Grade of disability		Total	$\chi^2$	P
		Grade 1	Grade 2			
Type of leprosy	Multibacillary	639 (54.3)	537 (45.7)	1,176 (100)	1.604	0.2053
	Paucibacillary	24 (64.9)	13 (35.1)	37 (100)		
Age at the time of diagnosis (years)	0–14	1 (14.3)	6 (85.7)	7 (100)	16.07	0.001
	>14–19	4 (26.7)	11 (73.7)	15 (100)		
	>19–60	428 (58.15)	308 (41.85)	736 (100)		
	>60	230 (50.5)	225 (49.5)	455 (100)		
Gender	Male	434 (57.0)	327 (43.0)	761 (100)	4.638	0.031
	Female	229 (50.7)	223 (49.3)	452 (100)		
Residence	Urban	91 (26.6)	251 (73.4)	342 (100)	1.512	0.000
	Rural	572 (65.7)	299 (34.3)	871 (100)		
Total		663 (54.7)	550 (45.3)	1,213 (100)		

Figures in parenthesis denote percentages.

In this study, disability of any type was proportionately more in female when compared with male subjects although the difference was not statistically significant. Most common disability among study subjects were claw hand (60%) in the study by Jain *et al.*,<sup>[2]</sup> while in our study, anesthesia in palm was the most commonly observed disability (78.5%) among disabilities of all types [Table 3] but anesthesia sole was the most common involved disability among disabilities in feet. With regard to disabilities in eyes, lagophthalmos was most common one (6.9%), while Sarkar *et al.*<sup>[10]</sup> found that, in eyes, 1.2% showed lagophthalmos. In addition, contradictory findings were seen in the study by Chavan *et al.*,<sup>[12]</sup> in which ulcer was the most common type of grade 2 disability (61.54%), which was significantly higher in female subjects ( $P < 0.05$ ). Hands and feet disabilities were found in 38.10%, while none showed eye-related disability. In line to aforementioned

findings, in the study by Jain *et al.*,<sup>[13]</sup> it was found that the most common deformity seen was insensitivity in hand and ulcers in foot. Other deformities commonly noted were claw hand (20.8%), absorption of digits of foot and hand and lagophthalmos. The study carried out by Sharma *et al.*<sup>[14]</sup> had also shown similar results. Inadequate care of anesthetic hands and feet by patient and/or lack of knowledge, awareness, and health education regarding protection of anesthetic limbs from constant injury during cooking, washing, and further household work can result in ulcer formation. Thus, people should be provided health education regarding care of deformities.

### Strength

This is an important study that provides information on grades of disability among leprosy patients along with association of some sociodemographic factors. As it was a

**Table 3:** Nature of disability found in different sites of studied live leprosy patients and gender ( $n = 1,213$ )<sup>a</sup>

Nature of disability in different sites	Female ( $n = 452$ )	Male ( $n = 761$ )	Total ( $n = 1,213$ )	$\chi^2$	$P$
Disability in eyes				1.211	0.5722
°Lagophthalmos	43 (9.5)	41 (5.3)	84 (6.9)		
°Low vision	1 (0.2)	0 (0)	1 (0.1)		
°Red eye	4 (0.8)	5 (0.6)	9 (0.7)		
Disability in hands				7.807	0.0989
°Anesthesia palm	365 (80.7)	588 (77.2)	953 (78.5)		
°Ulcer hand	1 (0.2)	2 (0.2)	3 (0.2)		
°Absorption finger	6 (1.3)	4 (0.5)	10 (0.8)		
°Claw hand	187 (41.3)	245 (32.1)	432 (35.6)		
°Others	2 (0.4)	0 (0)	2 (0.1)		
Disability in feet				6.717	0.1516
°Anesthesia sole	334 (73.8)	547 (71.8)	881 (72.6)		
°Ulcer foot	50 (11.0)	75 (9.8)	125 (10.3)		
°Absorption foot	6 (1.3)	9 (1.1)	15 (1.2)		
°Foot drop	131 (28.9)	154 (20.2)	285 (23.4)		
°Others	2 (0.4)	1 (0.1)	3 (0.2)		

Figures in the parentheses indicate column-wise percentages.

<sup>a</sup>Multiple response.

**Table 4:** Nature of disability found in different sites of studied leprosy patients and type of leprosy ( $n = 1,213$ )<sup>a</sup>

Nature of disability in different sites	Paucibacillary ( $n = 37$ )	Multibacillary ( $n = 1,176$ )	Total ( $n = 1,213$ )
Disability in eyes			
°Lagophthalmos	0 (0)	84 (7.1)	84 (6.9)
°Low vision	0 (0)	9 (0.7)	9 (0.7)
°Red eye	0 (0)	8 (0.6)	8 (0.6)
Disability in hands			
°Anesthesia palm	27 (72.9)	926 (78.7)	953 (78.5)
°Ulcer hand	0 (0)	4 (0.3)	4 (0.3)
°Absorption finger	0 (0)	10 (0.8)	10 (0.8)
°Claw hand	11 (29.7)	421 (35.7)	432 (35.6)
°Others	0 (0)	2 (0.1)	02 (0.1)
Disability in feet			
°Anesthesia sole	28 (75.6)	853 (72.5)	881 (72.6)
°Ulcer foot	3 (8.1)	122 (10.3)	125 (10.3)
°Absorption foot	6 (16.2)	15 (1.2)	21 (1.7)
°Foot drop	0 (0)	280 (23.8)	280 (23.1)
°Others	0 (0)	2 (0.1)	2 (0.1)

Figures in the parentheses indicate column-wise percentages.

<sup>a</sup>Multiple response.

record-based study, there were no chance of recall bias, and a more number of leprosy patients were studied. Consent of the subject of the record was not needed, and it was easier to get information from large numbers of cases.

### Limitation

Few patients enrolled in the study were before introduction of multidrug therapy. So these data do not accurately reveal current health services related to leprosy. As records were available only for few study variables, many of the factors associated with disability in leprosy patients could not be studied in detail. Quality of records was out of control of the researcher; so, misclassification of leprosy cases could be a possibility in the study. A more careful investigation to assess the disability status of leprosy patients requires the patients to be followed up for a long period from the time of diagnosis to several years after completing the treatment course; so, lack of follow-up was another limitation.

### Conclusion

To conclude, early detection and proper monitoring of new cases are required to facilitate effective management, disability limitation, and rehabilitation. The chances of acquiring disability in leprosy patients increase as the severity of leprosy increases such as MB patients. The family member of newly diagnosed patient should be screened regularly for leprosy. This would allow earlier institution of therapy and reduce morbidity and deformity. Awareness about the signs and symptoms and lepra reaction among the patients can help reduce the incidence of disability among the leprosy patients.

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### References

1. Msyamboza KP, Mawaya LR, Ngaomo D, Kubwalo HW, Liabunya M, Manjolo S, et al. Burden of leprosy in Malawi: community camp-based cross-sectional study. *BMC Int Health Hum Rights* 2012;12:12.
2. Jain S, Mishra MK, Gupta SK, Jain V, Balpande L. A retrospective study of epidemiological trends of leprosy in an urban leprosy centre of Madhya Pradesh. *Natl J Community Med* 2014;5(1):114–7.
3. Richardus JH. Leprosy remains an important public health challenge in India. *Indian J Med Res* 2013;137(5):878–9.
4. WHO. *WHO Expert Committee on leprosy: Eighth Report*. TRS-968. Italy: WHO, 2012.
5. Alberts CJ, Smith WC, Meima A, Wang L, Richardus JH. Potential effect of the World Health Organization's 2011–2015 global leprosy strategy on the prevalence of grade 2 disability: a trend analysis. *World Health Organ Bull* 2011;89(7):487–95. Available at: <http://www.who.int/bulletin/volumes/89/7/10085662/en/> [last accessed on 25 October 2015].
6. Dhillon GPS, Barkakaty BN. National Leprosy Eradication Programme in India: Achievements and deficiencies. *Health Administrator* 18(2):4–7.
7. Chaitra P, Bhat RM. Postelimination status of childhood leprosy: report from a tertiary-care hospital in south India. *BioMed Res Int* 2013;2013:328673.
8. Asia AJ, Tapre V, Asia AA. Epidemiological profile of disability in patients with leprosy in a tertiary care centre. *Int J Sci Res Publ* 2015;5(8):1–3.
9. Schipper A, Lubbers WJ. Disabilities of hand, feet, and eyes in newly diagnosed leprosy patients in Eastern Nepal. *Lepr Rev* 1994;65(3):239–47.
10. Sarkar J, Dasgupta A, Dutt D. Disability among new leprosy patients, an issue of concern: an institution based study in an endemic district for leprosy in the state of West Bengal, India. *Indian J Dermatol Venereol Leprol* 2012;78:328–34.
11. Rad F, Ghaderi E, Moradi G, Salimzadeh H. The study of disability status of live leprosy patients in Kurdistan province of Iran. *Pak J Med Sci* 2007;23(6):857–61.
12. Chavan LB, Patel P. Epidemiology of disability in incident leprosy patients at supervisory urban leprosy unit of Nagpur city. *Natl J Community Med* 2011;2(1):119–23.
13. Jain PK, Tripathi D, Singh CM, Srivastava DK, Sharma A, Bansal M. A study of high disability rate among leprosy affected persons in Gwalior district. *Indian J Community Health* 2011;23(2):90–2.
14. Sharma P, Kar HK, Beena KR, Kaur H, Narayan R. Disabilities among multibacillary leprosy patients; before, during and after multi drug therapy. *Indian J Lepr* 1996;68:127–36.

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