

## Clinical and Sociodemographic Characteristics of Recently Identified Leprosy Patients in Sangli District of Maharashtra

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### ABSTRACT

Exploring the prevalence of physical disabilities due to leprosy disease is a crucial work as it is a major sequela leading to loss of earnings, social stigma and psychological strain. This study has been carried out to evaluate the sociodemographic profile, clinical features pertaining to disabilities due to leprosy among newly detected leprosy cases in Sangli district of Maharashtra. It is a descriptive cross-sectional study carried out at tertiary health centre from 8 February 2024 to 31 December 2024. Newly detected leprosy patients from all community health centres and leprosy care centres at Sangli District were included in the study after taking informed consent. A structured questionnaire was used to get information about sociodemographic profile, clinical features, disability and treatment status. The data was procured from the National Leprosy Elimination Programme (NLEP) registry with the permission of appropriate authorities. The community level interview was also conducted to get the complete information. Demographic, socio-economic details were noted down. Detail clinical features like duration of illness, type and subtype of leprosy, type of deformities, the WHO grading and EHF scores were noted. Presence of lepra reaction and its type was documented. Non-compliance for the treatment and its reason were also recorded. Total 55 patients were enrolled for the study. Patients were classified as per WHO grading system into Grade 0, Grade 1 and Grade 2 categories. The number of multibacillary cases were alarming; suggests the changing disease pattern, latent disease in the community and delayed presentation.

**Keyword:** Disability, leprosy, deformity

### 1. INTRODUCTION

Leprosy caused by *Mycobacterium Lepae* is a potentially disabling infectious disease. Physical deformity is the main sequelae of leprosy disease. Many developing countries grapple with stigma, discrimination and socioeconomic burden due to these physical deformities<sup>1</sup>. Attributed to the overt healthcare burden, Leprosy is considered as a major public health problem.

The global Leprosy status has changed significantly over last four decades after introduction of the multidrug therapy (MDT) in 1982. The prevalence of leprosy has drastically reduced from over 5 million cases in mid 1980s to less than 2,00,000 at the end of 2016. The countries with highest number of new leprosy cases every year are India, Brazil, Indonesia and Bangladesh. Currently more than half of all new cases of leprosy in the world are diagnosed in India. The number of new cases has increased by 15.7% in 2021-22 as compare to the previous year. There were 88,278 active cases in India till January 2023<sup>2</sup>.

Maharashtra state has reported maximum number of cases (17,014) followed by Bihar (11318), Uttar Pradesh (10,312), Chhattisgarh (7422), Madhya Pradesh (7313), Jharkhand (6184), Odisha (6088) and West Bengal (5012). Taking note of this, the Government of India has launched National Strategic Plan (NSP) and Roadmap for leprosy (2023-27) on January, 30, 2023, for zero transmission of leprosy by 2027. The NSP contains implementation strategies, targets, public health approaches, and overall technical guidance to focus on zero stigma and discrimination through the National leprosy eradication programme (NLEP). Data from the Ministry of Health and Family Welfare (MoHFW), India, has reported that decline in the case detection has led to increase in patients with grade 2 disabilities. These hidden cases and a probable increase in grade 2 disabilities, may delay attainment of the goal of zero leprosy<sup>3</sup>.

Considering the high disease burden in Maharashtra and the healthcare cost associated, it becomes necessary to explore the

pattern of leprosy disease and disabilities. This exploratory study has observed the disease characteristics and the associated disabilities among the newly detected leprosy patients.

## 2. MATERIALS AND METHODS

This was a hospital and community based cross-sectional study conducted from 8 February 2024 to 31 December 2024. Newly detected leprosy patients from all community health centres and leprosy care centres at Sangli District were included in the study after taking informed consent. This study was conducted in accordance with the Helsinki declaration of 2000 and was carried out only after obtaining the Institutional Ethics Committee clearance. The data was procured from the National Leprosy Elimination Programme (NLEP) registry with the permission of appropriate authorities.

Demographic, socio-economic details were noted down. Detail clinical features like duration of illness, type and subtype of leprosy, type of deformities, the WHO grading and EHF scores were noted. Presence of lepra reaction and its type was documented. Non-compliance for the treatment and its reason were also recorded.

## 3. RESULTS

**Table no.1 – Sociodemographic variables N=55**

Sociodemographic variables		Frequency	Percentage
<b>GENDER</b>	Male	38	69.09
	Female	17	30.09
<b>AGE</b>	18-30	10	18.18
	31-60	32	58.18
	61+	13	23.63
<b>EDUCATION</b>	No formal education	7	12.72
	Up to SSC	43	78.18
	HSC	3	5.45
	Graduation and above	2	3.63
<b>RESIDENCE</b>	Urban	6	10.90
	Rural	42	76.36
	Semiurban	6	10.90
<b>OCCUPATION</b>	Unemployed	18	32.72
	Daily wages	33	60
	Self employed	2	3.63
	Salaried	2	3.63
<b>ECONOMY</b>	BPL	52	94.54
	Non-BPL	3	5.45

The total number of patients included in the study were 55, out of which 69.09% (n= 38) were males and 30.9% (n=17) were females (M: F = 2.2:1). Most of the patients belonged to the age group of 31-60 years (58%) .

78% (n=43) patients reported secondary school certificate (SSC) as their highest educational qualification. Only 2 were graduated and 7 has no formal education. Most of the patients [76% (n=42)] were from rural background. Most of the patients 33(60%) were either farmer or unskilled worker class dependent on daily wages. Maximum number of patients 52(94.5%) belonged to the economically weaker section of community.

**Table no.2 - Prevalent clinical features N=55**

Prevalent clinical features		Frequency	Percentage
<b>DETECTION MODE</b>	Active	46	83.63
	Passive	9	16.36
<b>TYPE OF LEPROSY (WHO CLASSIFICATION)</b>	Multibacillary	44	80
	Paucibacillary	11	20

<b>SUBTYPE OF LEPROSY</b>	Lepromatous	40	72.72
	Tuberculoid	5	9.0
	Borderline	6	10.9
	Indeterminate	4	7.27
<b>FIRST SYMPTOM APPEARED</b>	Skin patches with loss of sensation	52	94.54
	Numbness in hands & feet	4	7.27
	Ulcers in hands & feet	2	3.6
	Claw hand	0	0
	Foot drop	0	0
	Lagophthalmos	0	0
<b>TOTAL NO OF SKIN LESIONS</b>	Less than 5	19	34.54
	More than 5	36	65.45
<b>NERVE INVOLVEMENT</b>	Ulnar	31	56.36
	Anterior tibial	10	18.18
	Lateral popliteal	13	23.63
	Greater auricular	4	7.27
	Supraclavicular	4	7.27
	Supraorbital	10	18.18
<b>NO. OF NERVE INVOLVEMENT</b>	Less than 3	43	78.18
	More than 3	12	21.81
<b>PATTERN OF NERVE INVOLVEMENT</b>	Symmetrical	41	74.54
	Asymmetrical	3	5.45
<b>DURATION OF NERVE INVOLVEMENT</b>	Less than 12 months	38	69.09
	More than 12 months	7	12.72
<b>LEPROSY REACTION</b>	Yes	16	29.09
	No	39	70.9
<b>TYPE OF LEPROSY REACTION</b>	Type I	5	9.0
	Type II	11	20
	Mixed	0	0

All the patients were detected, diagnosed and graded as per the guidelines by National Leprosy Eradication Programme (NLEP) and WHO. Most patients 46 (83.6%) were detected by healthcare professionals during community level diagnostic survey, while only 9 patients reported themselves in the leprosy and community health care centres.

As per NLEP modified WHO classification 80% (n=44) patients belonged to multibacillary type, while the remaining 20% (n=11) belonged to the paucibacillary type of leprosy. As per Ridley–Jopling classification 72.72% (n=40) patients belonged to lepromatous subtype of the leprosy.

Upon clinical evaluation, 94.54% (n=52) patients reported the skin patches with loss of sensation as their first symptom.

Two patients reported ulcer on hand or feet as their first symptom. Most patients 65.45% (n=36) had more than 5 skin lesions at their first diagnosis. Detail neurological evaluation revealed ulnar nerve involvement in 31(56.36%) patients. Most of the patients 41(74.54%) had symmetrical pattern of nerve involvement.

All patients were given Multidrug therapy (MDT) immediately once diagnostic evaluation was completed. Ready-made blister calendar packs are supplied by WHO through Govt of India to all Nationwide leprosy centres free of cost. Patients with multibacillary leprosy were provided with a daily dose of clofazimine with dapsone and rifampicin monthly. Patients with paucibacillary leprosy were provided with dapsone daily and rifampicin once a month. Apart from them steroids are used to alleviate the pain related to nerve involvement.

Total 16 (29%) patients had lepra reaction, out of them 5 patients had type I and 11 had type II reaction. Most of the patients 48 (87%) were compliant with the treatment. Only 7 patients had poor compliance either due to intolerance of drug or lack of transport facility in the area.

**Table no.3 – Clinical features related to physical disability N=55**

Clinical features related to physical disability		Frequency	Percentage
<b>WHO TYPE OF DISABILITY</b>	Grade 0	25	45.45
	Grade 1	25	45.45
	Grade 2	5	9.0
<b>EHF SCORE</b>	9-12	0	0
	4-8	10	18.18
	0-3	45	81.81
<b>ORGANS WITH DISABILITIES</b>	Eye	11	20
	Hand	10	18.18
	Foot	5	9.0
	Both hand and foot	12	21.81
	Hand foot eye	20	36.36
<b>DURATION OF DISABILITY</b>	Less than 1 year	48	87.27
	1 to 2 years	4	7.27
	3 to 5 years	1	1.8
	5 years and above	2	3.6

Evaluation of physical disability was performed and grading of disabilities was done according to WHO classification. It showed that total 25 patients had grade 0 disability, 25 patients had grade 1 disability while 5 patients had grade 2 disability. Evaluation of organs with disability showed that hand, foot and eye all three were involved in 20 patients, while both hand and foot were involved in 12 patients. Total 8 patients had paralytic deformities, out of them 3 had claw hand, while 8 had lagophthalmos. Ulceration of foot was noted in 4 patients, 2 of them has skeletal disorganisation. No patient underwent corrective surgery for the deformity.

#### 4. DISCUSSION

Leprosy continues to be a disease of poverty-stricken individuals. Most of the patients in our study were economically weaker, middle-aged males from the rural background with deficient educational status, mostly dependent on daily wages. Apart from this, social inequality, population growth, poor housing condition were also associated with high prevalence of leprosy according to previous studies<sup>22,23</sup>. Majority patients (78%) in our study barely completed secondary level of

education. Low level of education has been associated with severity of disease in most of the studies<sup>4</sup>. Almost all patients in our study were diagnosed at community level by health survey conducted by leprosy professionals. Very few patients (n=9) actively visited healthcare facility for consultation. Widespread stigma and discrimination at community level results in tendency to hide the disease symptoms<sup>13</sup>. Such masking leads to a higher number of undisclosed cases with highly infective and advanced disease.

Paucibacillary leprosy is commoner in India<sup>9</sup>. However, our study discovered alarming number of patients (80%) with multibacillary (MB) leprosy, most having symptoms more than six months. This high number of MB patients may suggest a delay in diagnosis. Multiple factors like late presentation due to stigma, difficult access to healthcare system, are responsible for the delay. Studies suggest that the delay in diagnosis among individuals with G2D was more than that for individuals with no disability, which is in line with the current study<sup>14</sup>. In our study all patients (n=5) with grade 2 disability had MB type of disease. Multibacillary leprosy patients have higher risk of deformity compared to pauci-bacillary leprosy type<sup>10,11</sup>.

Lepromatous subtype of leprosy was observed in 72% of the patients. Lepromatous form of leprosy had more association with disabilities as shown in other studies<sup>4,5,21</sup>. Most of the patients in our study had more than 5 skin lesions at the presentation. This increases their risk for neurological involvement. Previous studies have shown that such more severely affected patients are imposed to the risk of anaesthetic and paralytic deformities<sup>15,18,20</sup>. In current study more than 50% patients had anaesthetic deformities. The reason being the common subtype of lepromatous leprosy which has delayed presentation due to absence of early symptoms, leading to glove and stocking anaesthesia.

Peripheral nerve involvement has been associated with physical disability which is a serious sequel of leprosy<sup>4,7,18</sup>. Previous studies from India<sup>5,12</sup>, Bangladesh<sup>19</sup>, and Brazil<sup>17</sup> observed that patients with three or more nerve involvement are prone for disabilities. In our study 12 patients had more than 3 nerves involvement. Involvement of ulnar nerve was noted in 56% of the patients. However, most of the patients had symmetrical pattern of nerve involvement.

Although Government has active National Leprosy Eradication Programme (NLEP), its proper implementation at community level needs extended efforts. Public awareness should be stressed more as a preventive measure. Most of the patients in our study were living in a crowded kaccha houses with poor ventilation, sanitation facilities. Many were unable to follow proper hygiene practices like daily bathing due to poor water supply in their area. Most of them were also using common bathing towels. All these environmental factors increased their risk for disease transmission. Our study recorded maximum patients with grade 1 disability similar to other studies in tropical countries. Type 2 lepra reaction was observed in most patients due to lepromatous subtype of leprosy. Individuals with reactive outbreaks of leprosy are more susceptible for neural damage and further sequelae<sup>6,8,16</sup>. In this study 29% patients had a leprosy reaction. This is a significant variable for the development of disability<sup>17</sup>.

In summary, our study revealed high number of patients with multibacillary type of leprosy. This changing trend could possibly increase the risk of developing the disabilities among these patients. Very few patients reported directly to the healthcare facility, most of them were detected by an active community survey, exhibiting an iceberg phenomenon. This highlights the need to accelerate the detection of the hidden, undiagnosed leprosy cases in the community.

## 5. LIMITATIONS

This study was conducted among limited population in Sangli District of Maharashtra state of India. It was a time bound, cross-sectional study with a small sample size. The study findings may be applicable to Western part of Maharashtra state and should be interpreted with caution while generalising the findings to other parts of the country.

## 6. CONCLUSIONS

Major challenges of leprosy program in India are patient related delay, lack of awareness, indigent living conditions and social stigma. Core points focusing on early reporting of the symptoms, causes and consequences of the disability, availability of a chargeless diagnostic and treatment facility at public health centre should be emphasised during awareness campaigns. There is a need to identify specific risk factors for the development of the disability among leprosy patients

## REFERENCES

- [1] National Strategic Plan and Roadmap for Leprosy | 2023-2027
- [2] Hidyana L. de Paula, Carlos D.F.de Souza, Risk Factors for Physical Disability in Patients with Leprosy: A Systematic Review and Meta-analysis; JAMA Dermatol. doi:10.1001/jamadermatol.2019.1768.
- [3] Cristiane Moschioni, Carlos Maurício de Figueiredo Antunes, Risk factors for physical disability at diagnosis of 19,283 new cases of leprosy; Rev Soc Bras Med Trop 43(1):19-22, Jan-Feb, 2010.
- [4] Antunes DE, Ferreira GP, Nicchio MVC, Araujo S, Cunha ACR da, Gomes RR, et al. Number of leprosy reactions during treatment: clinical correlations and laboratory diagnosis. Rev Soc Bras Med Trop [Internet].

2016Nov;49(6):741–5. Available from: <https://doi.org/10.1590/0037-8682-0440-2015>

- [5] Kumar A, Girdhar A, Girdhar BK (2012) Risk of developing disability in pre and post-multidrug therapy treatment among multibacillary leprosy: Agra MB Cohort study. *BMJ Open* 2: e000361
- [6] Jacob JT, Kozarsky P, Dismukes R, Bynoe V, Margoles L, Leonard M, Tellez I, Franco-Paredes C (2008) Short Report: Five-year Experience with Type 1 and Type 2 Reactions in Hansen Disease at a US Travel Clinic. *Am J Trop Med Hyg* 79: 452-454.
- [7] Wilder-Smith EP, Van Brakel WH (2008) Nerve Damage in leprosy and its management. *Nat Clin Pract Neurol* 412: 656-663.
- [8] Meima A, van Veen NH, Richardus JH (2008) Future prevalence of WHO grade 2 impairment in relation to incidence trends in leprosy: an exploration. *Trop Med Int Health* 13: 241-246.
- [9] World Health Organisation. Global Leprosy Situation, 2005. *Weekly Epidemiol Rec*, 2005; 80: 292.
- [10] Moschioni C, Antunes CM de F, Grossi MAF, Lambertucci JR. Risk factors for physical disability at diagnosis of 19,283 new cases of leprosy. *Rev Soc Bras Med Trop*. 2010; 43: 19–22. <https://doi.org/10.1590/S0037-86822010000100005> PMID: 20305962.
- [11] Srinivas G, Muthuvel T, Lal V, Vaikundanathan K, Schwienhorst-Stich E-M, Kasang C (2019) Risk of disability among adult leprosy cases and determinants of delay in diagnosis in five states of India: A case-control study. *PLoS Negl Trop Dis* 13(6): e0007495. <https://doi.org/10.1371/journal.pntd.0007495>
- [12] Selvaraj G, Prabakar N, Muliyl J, Martin G (1998) Incidence of disabilities among multi-bacillary cases after initiation of multidrug therapy and factors associated with the risk of developing disabilities. *Indian J Lepr* 70: 11-16.
- [13] Go´mez L, Rivera A, Vidal Y, Bilbao J, Kasang C, Parisi S, et al. Factors associated with the delay of diagnosis of leprosy in north-eastern Colombia: a quantitative analysis. *Trop Med Int Heal*. 2018; 23:193–198. <https://doi.org/10.1111/tmi.13023> PMID: 29230912
- [14] Nicholls PG, Croft RP, Richardus JH, Withington SG, Smith WCS. Delay in presentation, an indicator for nerve function status at registration and for treatment outcome—the experience of the Bangladesh Acute Nerve Damage Study cohort. *Lepr Rev*. 2003; 74: 349–56. PMID: 14750580
- [15] Sarkar J, Dasgupta A, Dutt D (2012) 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* 78: 28-34.
- [16] Jardim MR, Illarramendi X, Nascimento OJM, Nery JAC, Sales AM, Sampaio EP, Sarno EN (2007) Pure neural leprosy: Steroids prevent neuropathy progression. *Arq Neuro-Psiquiatr* 65: 969-973
- [17] Gonçalves SD, Sampaio RF, Antunes CMF (2008) Occurrence of neuritis among leprosy patients: survival analysis and predictive factors. *Rev Soc Bras Med Trop* 41: 464-469.
- [18] Richardus JH, Finlay KM, Croft RP, Smith WC (1996) Nerve function impairment in leprosy at diagnosis and at completion of MDT: A retrospective cohort study of 786 patients in Bangladesh. *Lepr Rev* 67: 297-305.
- [19] Croft, RP, Richardus JH, Nicholls PG, Smith WC (1999) Nerve function impairment in leprosy: design, methodology, and intake status of a prospective cohort study of 2664 new leprosy cases in Bangladesh (The Bangladesh Acute Nerve Damage Study). *Lepr Rev* 70: 140-159
- [20] Monteiro LD, Alencar CHM, Barbosa JC, Braga KP, Castro MD, Heukelbach J (2013) Physical disabilities in leprosy patients after discharge from multidrug therapy in Northern Brazil. *Cad Saúde Pública* 29: 909-920.
- [21] Kumar A, Girdhar A, Girdhar BK (2003) Epidemiology of leprosy in urban Agra, India. *Lepr Rev* 74: 31-34.
- [22] Ponnighaus JM, Fine PE, Sterne JA, Malema SS, Bliss L, Wilson RJ (1994) Extended schooling and good housing conditions are associated with reduced risk of leprosy in rural Malawi. *Int J Lepr Other Mycobact Dis* 62: 345-352
- [23] Kerr-Pontes LRS, Barreto ML, Evangelista CMN, Rodrigues LC, Heukelbach J, Feldmeier H (2006) Socioeconomic, environmental, and behavioural risk factors for leprosy in North-east Brazil: results of a case-control study. *Int J Epidemiol* 35: 994-1000.

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