

# Clinical profile of newly diagnosed leprosy patients with special references to deformities and disabilities



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## ABSTRACT

**Background:** After leprosy was declared eliminated as a public health problem in India on December 2005, the focus has shifted to the prevention of disability and deformities. This indirectly measures the effectiveness of health education and awareness. **Aims and Objectives:** This study was conducted to assess the clinical profile and different patterns of disabilities and deformities among newly diagnosed leprosy patients. **Materials and Methods:** A cross-sectional study was conducted for a period of 1 year on newly diagnosed leprosy patients attending a tertiary care hospital in Kerala. 32 patients included in the study were examined and disabilities observed were graded using WHO disability grading system. The variables are mentioned as numbers and percentages. **Results:** 50% of the subjects had different grades of deformity/disability (6.25% had Grade 1 disability while 43.75% had Grade 2 disability). The mean duration of disease in patients with and without deformities was 44.19 and 20.5 months, respectively, which was statistically significant ( $P=0.025$ ). A positive family history of Hansen's disease was present among 5 (15.63%) patients. The different disability/deformity observed were ulcers, scars, muscle weakness, and redness of eyes. Feet were the most commonly affected site. **Conclusion:** Proper health education and awareness activities that will promote early recognition of symptoms and reporting are crucial to decrease deformities.

**Key words:** Newly diagnosed leprosy patients; Deformities; Disability; WHO disability grading

## INTRODUCTION

Leprosy, also known as Hansen's disease, is a chronic granulomatous disease caused by *Mycobacterium leprae*. The disease is mainly transmitted through respiratory droplets. It affects people of all age groups and races. The incubation period ranges from 2 to 10 years.<sup>1</sup> Leprosy has a wide range of clinical manifestations and affects almost all organs but primarily affects the skin and peripheral nerves. Clinical presentation varies from insignificant self-healing skin lesions to more severe widespread disease.

The National Leprosy Eradication Program of India took several measures to eliminate the disease from the country since 1983. Leprosy was declared eliminated as a public health problem in India on December 2005, after attaining a prevalence rate of 0.95/10,000 population.<sup>2</sup> However, the disease is far from being eradicated and new cases of leprosy continue to present with varying degrees of deformities and disabilities from all sections of economic and social status. The present study was conducted to study the clinical profile of newly diagnosed leprosy patients regarding deformities and disabilities in a tertiary care hospital in Kerala.

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## Aims and objectives

1. To study the clinico-epidemiological profile of newly diagnosed leprosy patients
2. To know the pattern of disabilities and deformities in different categories of leprosy and find out its association with various epidemiological features.

## MATERIALS AND METHODS

This hospital based cross-sectional study was conducted from January 1<sup>st</sup>, 2013 to December 31<sup>st</sup>, 2013 on newly diagnosed leprosy patients attending the leprology clinic in a tertiary care hospital. Institutional Ethics Committee approval was obtained for conducting this study.

After obtaining an informed written consent, the relevant history and examination findings were recorded in a structured pro forma. Disabilities observed were graded using the WHO disability grading for hands, feet, and eyes as per the operational guideline given in Global Strategy for Further Reducing the Leprosy Burden and Sustaining Leprosy Control Activities (plan period 2006–2010).<sup>1</sup> A diagnosis was made based on clinical examinations and confirmed by slit-skin smear. Skin biopsy was also performed from representative skin lesion and also from anesthetic areas in patients with no skin lesion. Cases of leprosy who were already on treatment, relapse cases, and defaulters and patients not willing to give consent were excluded from the study. The variables are mentioned as numbers and percentages.

## RESULTS

Totally 32 patients were studied. Relevant history taking, detailed clinical examination, slit-skin smear, and skin biopsy were performed in all the enrolled patients. The age group most frequently affected was between 21 and 40 years. The youngest subject was a 5-year-old boy and the oldest subjects were three 65-year-old men. Among the 32 patients, there were 23 males (72%) and 9 females (28%) with male-to-female ratio of 2.6:1. Maximum patients with deformities also belong to the age group of 21–40 years. There were 16 patients (50%) who presented with deformity and disability and males comprise 75% of the patients with disabilities and deformities. There were 13 manual laborers (40.63%) and they constitute the majority of case with deformity and disability (62.5%).

There were 13 patients (40.63%) with borderline tuberculoid leprosy, followed by lepromatous leprosy (n=8) (25%). Seven patients (21.87%) had borderline lepromatous leprosy and there were two patients (6.25%) each having

tuberculoid and pure neuritic leprosy. There was no patient having indeterminate or mid-borderline leprosy. Patients with lepromatous leprosy comprised the majority of cases with deformity and disability.

Grade-1 disability characterized by loss of sensation either in the hands or feet were seen in two patients, while 14 patients had Grade 2 (visible deformity) disability in the eyes, hands, and feet. The different types of deformity observed were as shown in Table 1.

The time interval between noticing of symptoms and seeking treatment was more than 1 year in 21 patients (65.63%) and only 11 (34.37%) patients presented within 1 year of noticing symptoms. Only three patients (18.75%) came for treatment within 1 year of noticing symptoms among the patients with disabilities while eight patients without disabilities presented within 1 year of noticing symptoms (P=0.14 and Chi-square value is 2.22). The mean duration of disease in patients with deformities was 44.19 months while those without deformities reported after a mean delay of 20.5 months which was statistically significant (P=0.025).

The involvement of the peripheral nerve is as shown in Table 2. Majority of the patients (n=13) without disability or deformity had no peripheral nerve involvement whereas only one case among the patients with disabilities and deformities had no clinically palpable thickening of peripheral nerves.

Motor weakness was found in 11 patients due to involvement of the ulnar nerve (54.54%), posterior tibial nerve (54.54%), common peroneal nerve (9%), and facial nerve (9%). There were two patients who presented with type-1 lepra reaction, one patient with type-2 lepra reaction and one patient had both type-1 and type-2 lepra reaction. All those four patients had Grade 2 disability with motor palsy.

**Table 1: Deformities/disabilities of hands, feet, and eyes**

Deformity/disability	Males	Females	Total
<b>Hands</b>			
Anesthesia	4	4	8
Scar	2	1	3
Ulcer	2	0	2
Visible clawing of hands	1	0	1
Weakness of muscles supplied by ulnar nerve	6	0	6
<b>Feet</b>			
Anesthesia	8	4	12
Scar	3	2	5
Ulcer	1	0	1
Foot drop	1	0	1
Loss of fanning of toes	4	2	6
Glove and stocking anesthesia	3	1	4
<b>Eyes</b>			
Lagophthalmos	1	0	1
Redness of eyes	2	0	2

**Table 2: Peripheral nerve involvement among patients**

Nerves	Ulnar nerve	Common peroneal nerve	Radial cutaneous nerve	Superficial peroneal nerve	Greater auricular nerve	Ulnar cutaneous nerve	Sural nerve	Posterior tibial nerve	Supra-clavicular nerve	Infra-orbital nerve
No of patients	11	10	9	8	5	3	3	3	1	1

## DISCUSSION

Among the 32 patients included in this study, maximum patients (n=20) were diagnosed to have borderline leprosy with 13 being borderline tuberculoid and 7 being borderline lepromatous leprosy. Similar findings are observed by other studies conducted by Tilva et al.,<sup>3</sup> and by Reyila et al.,<sup>4</sup> where maximum patients belonged to the borderline spectrum and comprise 39.68% and 51.3% of their patients, respectively.

There were eight patients with lepromatous leprosy (25%) and two patients had tuberculoid leprosy (6.25%). There were two cases of pure neuritic leprosy (6%). Both of the patients with neuritic leprosy had Grade 2 disability with sensory impairment and motor weakness. A higher incidence of paralytic deformity was also observed among pure neuritic type of leprosy by Reyila et al.,<sup>4</sup> and Kollerli et al.<sup>5</sup>

The most commonly affected age group was between 21 and 40 years. Maximum patients with deformities also belonged to this age group. This may be due to increased chance of acquiring infection and also sustaining trauma as they are the working age group. This was in concordance with the studies by Gupta et al.,<sup>6</sup> and Kumar et al.<sup>7</sup>

There were two children (6.25%) out of the 32 patients who both had a household contact with lepromatous leprosy. This indicates an active transmission of the disease and that the type of disease in the contact and proximity to the child are important factors determining the infection transmission.<sup>8</sup>

There were 23 (72%) males and 9 (28%) females with a male-to-female ratio of 2.56:1. This is in concordance with the general pattern of male preponderance established in other studies.<sup>6,7,9</sup> This may be due to more exposure increasing the opportunity for contact among male population and easier accessibility to seek treatment than females.<sup>10</sup> The under reporting in females may be due to sociocultural factors such as strong traditions, the low status of women, their limited mobility, illiteracy, and poor knowledge of leprosy.<sup>11-13</sup>

Among the patients with deformities and disabilities, seven (43.75%) had primary education and three (18.75%) were illiterate. This is in conformity with a study by Kumar et al.,<sup>7</sup> which established that majority of leprosy affected patients

had no formal education. Higher prevalence of deformities among manual workers observed in our study is akin to other studies,<sup>7,9,14</sup> due to higher chances of exposure and therefore, increased risk of infection.

In this study, the time gap between noticing of symptoms and seeking treatment was more than 1 year in 21 patients (65.63%) and only 11 (34.37%) patients presented within 1 year of noticing symptoms. A statistically significant higher incidence of deformity was seen in patients who reported late for treatment. Self-monitoring, simply ignoring the symptoms, and multiple visits to traditional medicine were identified as important factors contributing to delay in diagnosis and treatment.

The ulnar nerve was the most frequently affected nerve and observed among 11 patients. The incidence of Grade 2 deformities increases significantly in patients with three or more peripheral nerve enlargement.<sup>4,5</sup> In this study, four patients presented with lepra reaction (12.5%) and all those patients had Grade 2 disability with motor palsy. This shows that reaction greatly increases the risk for the development of disabilities and deformities.

Half of the study population were found to have various grades of deformity/disability according to the WHO disability grading for the eyes, hands, and feet. Grade 1 disability was seen in two patients (6.25%) while 14 patients (43.75%) had Grade 2 (visible deformity) disability. This is in contrast to the finding by Rathod et al.,<sup>15</sup> where 21.25% of their patients had Grade 1 deformity and 6.31% had Grade 2 deformity.

In this study, relatively few patients had leprosy-related eye problems. The feet were the most commonly affected site of disability followed by the hands in contrast to that observed by Rathod et al.<sup>15</sup> In the present study, there were two patients with superciliary madarosis and seven patients with ear lobe infiltration. However, visible facial impairments due to leprosy such as loss of eyebrows, enlarged ear lobes, and collapse of nose are not included in the current grading system nor are they mentioned in the WHO Expert Committee report.<sup>16</sup> Expansion of the grading system with a category for “facial impairments” may be useful.

### Limitations of the study

Small number of cases included in the study.

## CONCLUSION

This study demonstrated that leprosy is still far from eliminated in the country and is evident from the two childhood leprosy cases that active transmission of the disease continues to occur. The high incidence of Grade 2 disability is an alarming figure in this post-elimination era.

Proper health education and awareness activities that will promote early recognition of symptoms and reporting are crucial to prevent deformities. Information and education on disease presentation and availability of medical care will help in changing the perception and health-seeking behavior. Active case surveys may be needed to significantly reduce transmission. This will ultimately lead to reduction in disease burden and also prevent permanent deformity.

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**CLD**- Literature survey, prepared first draft of manuscript, implementation of study protocol, data collection, data analysis, manuscript preparation, and submission of article; **SG**- Concept, clinical protocol, manuscript preparation, editing, and manuscript revision; **CLB**- Design of study, statistical analysis, and interpretation; **RR**- Review manuscript; **LR**- Literature survey and preparation of figures; **PB**- Coordination and manuscript revision.

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