

Original Research Article

Epidemiological and clinical profile of leprosy patients at a tertiary care center in Moradabad: a retrospective study

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ABSTRACT

Background: Leprosy remains an important public health challenge in India despite achieving elimination status at the national level. Delayed diagnosis contributes to disability, deformity and continued transmission. This study assessed the epidemiological and clinical profile of leprosy patients attending a tertiary care center in Moradabad, Uttar Pradesh.

Methods: A retrospective record-based study was conducted among 186 clinically diagnosed leprosy patients attending the Department of Dermatology, Venereology and Leprology of a tertiary care teaching hospital over a two-year period. Data regarding demographic characteristics, clinical features, nerve involvement, disease classification, bacteriological status, lepra reactions, disability grading, treatment status and outcomes were analyzed using SPSS version 25.0.

Results: Most patients belonged to the 21–40 years age group (43.6%) and were from lower socioeconomic and educational backgrounds. The mean duration of symptoms was 11.8 ± 7.4 months. Peripheral nerve involvement was observed in 78.5% of patients and sensory loss in 90.3%. Multibacillary disease accounted for 59.1% of cases and slit-skin smear positivity was observed in 59.1%. Lepra reactions occurred in 29.0% of patients, predominantly Type I reactions. Grade 0 disability was present in 58.1% of patients, while visible deformities were identified in 17.2%, with claw hand being the most common deformity. Most patients were receiving multidrug therapy and 69.9% demonstrated clinical improvement.

Conclusions: The predominance of multibacillary disease, extensive nerve involvement and disability suggests delayed diagnosis and ongoing transmission. Strengthening early case detection, public awareness, surveillance and treatment adherence may reduce disability and improve leprosy control outcomes.

Keywords: Disability, Epidemiology, Lepra reaction, Leprosy, Multidrug therapy, Multibacillary leprosy

INTRODUCTION

Leprosy, also known as Hansen's disease, is a chronic granulomatous infectious disease caused by *Mycobacterium leprae* that primarily affects the skin, peripheral nerves and eyes. The disease manifests as a clinical spectrum determined by the host immune response, ranging from tuberculoid to lepromatous forms.

If left untreated, leprosy can lead to progressive nerve damage, deformities, disabilities and profound psychosocial consequences.¹

The introduction of multidrug therapy (MDT) and implementation of national leprosy control programs have significantly reduced the global burden of leprosy. India achieved the World Health Organization (WHO) target of elimination of leprosy as a public health problem at the

national level in 2005. However, elimination does not signify eradication of the disease and India continues to account for a substantial proportion of newly detected leprosy cases worldwide. Persistent transmission, delayed diagnosis, occurrence of multibacillary disease, childhood cases and grade 2 disabilities continues to pose significant challenges in the post-elimination era.³ Several studies conducted across India have demonstrated that leprosy remains an important public health concern.

A clinico-epidemiological study from Eastern India reported a predominance of multibacillary disease and highlighted the continued burden of leprosy among patients attending tertiary care facilities.¹ A community-based case-control study identified various epidemiological determinants influencing disease occurrence and transmission in endemic regions.²

Hospital-based studies from different geographical regions of India, including Tamil Nadu, North India, Himachal Pradesh and other tertiary care centers, have consistently reported a high proportion of multibacillary cases, male predominance and delayed presentation of patients.⁴⁻⁷ These findings indicate continued disease transmission, inadequate awareness and delay in seeking medical care. Furthermore, disability remains a major concern, as it reflects delayed diagnosis and contributes significantly to social stigma and reduced quality of life.

A retrospective analysis of institutional records demonstrated a considerable burden of disability among leprosy patients despite the availability of effective treatment.⁸ Long-term epidemiological studies have further emphasized the persistence of leprosy in endemic and post-elimination settings. Studies from Guyana and Delhi documented sustained case detection over extended periods, highlighting the need for continuous surveillance, early diagnosis and timely intervention to prevent disability and interrupt disease transmission.^{9,10} Uttar Pradesh is a densely populated region with diverse socioeconomic and demographic characteristics.

Moradabad serves as an important referral center for surrounding districts; however, recent data regarding the epidemiological and clinical characteristics of leprosy patients attending tertiary care institutions in this region remain limited.

Evaluation of demographic characteristics, clinical spectrum, bacteriological profile and disability status among patients presenting to a tertiary care center can provide valuable information regarding the current trends of leprosy and help formulate effective public health strategies for disease control and prevention.

Therefore, the present study was undertaken to assess the epidemiological and clinical profile of leprosy patients attending a tertiary care center in Moradabad, Uttar Pradesh, India.

Objectives

General objective

To evaluate the epidemiological and clinical profile of leprosy patients attending a tertiary care center in Moradabad, Uttar Pradesh, India.

Specific objectives

To study the demographic characteristics of leprosy patients, including age, sex and place of residence. To determine the distribution of leprosy across the Ridley–Jopling and WHO classifications. To assess the proportion of paucibacillary and multibacillary cases. To evaluate the clinical manifestations and patterns of nerve involvement among patients. To determine the prevalence of lepra reactions and associated complications. To assess the frequency and severity of disability among diagnosed patients. To analyze trends and patterns of leprosy cases presenting to the tertiary care center during the study period.

Specific aim

To describe the current epidemiological profile of leprosy patients presenting to a tertiary care hospital in Moradabad. To characterize the clinical spectrum of leprosy and associated complications in the study population. To identify the burden of disability and indicators of delayed diagnosis among patients. To generate region-specific data that may aid in strengthening leprosy surveillance, early detection and disability prevention programs.

METHODS

This retrospective observational study was conducted in the department of dermatology, venereology and leprology (DVL), Teerthanker Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India. The study included patients diagnosed with leprosy between February 2024 and August 2025 (approximately 18 months). Data were obtained from hospital medical records. As the study involved a retrospective review of existing records without any direct patient interaction, the requirement for informed consent was waived in accordance with institutional policy and applicable ethical guidelines.

The study was reported in accordance with the strengthening the reporting of observational studies in epidemiology (STROBE) guidelines for observational studies. A total of 186 patients diagnosed with leprosy during the study period were included using convenience sampling. The diagnosis of leprosy was established based on the presence of one or more of the following cardinal signs: hypopigmented or erythematous skin lesion(s) with definite loss or impairment of sensation, peripheral nerve involvement demonstrated by definite nerve thickening

associated with sensory impairment and/or a positive slit-skin smear examination for acid-fast bacilli (AFB). The study included patients aged 18–60 years of either sex with a clinical diagnosis of leprosy, irrespective of the clinical subtype according to the Ridley–Jopling classification. Patients who had been previously diagnosed with leprosy, were already receiving treatment and were attending follow-up visits during the study period were excluded from the analysis.

The primary outcome of the study was to describe the clinical and epidemiological profile of patients with leprosy. Data extracted from the hospital records included sociodemographic characteristics such as age, sex, occupation, religion, socioeconomic status or income, educational status and family history of leprosy. Clinical variables collected included the duration of disease, number of skin lesions and evidence of peripheral nerve involvement, including sensory and/or motor impairment. Disease-related variables comprised the Ridley–Jopling classification, WHO classification into paucibacillary (PB) and multibacillary (MB) disease, slit-skin smear status and bacteriological index (BI). Information regarding lepra reactions and disability, including the type of lepra reaction (Type I or Type II), disability grade and presence of deformities, was also recorded. In addition, treatment-related variables such as the treatment regimen administered, treatment status and clinical outcome were documented.

Data were entered into Microsoft Excel and analyzed using the Statistical Package for the Social Sciences (SPSS) software version 25.0. Descriptive statistics were used to summarize the study data. Categorical variables were expressed as frequencies and percentages, while continuous variables, where appropriate, were presented as mean±standard deviation (SD) for normally distributed data or median with interquartile range (IQR) for non-normally distributed data.

RESULTS

A total of 186 patients with leprosy were included in the study. The sociodemographic characteristics of the study population are presented in Table 1. The highest proportion of patients belonged to the 21–30 years age group (22.6%), followed by the 31–40 years (21.0%) and 41–50 years (19.4%) age groups. Patients aged ≤20 years constituted 9.7% of the study population.

Regarding educational status, 25.8% of patients had completed primary education, while 22.0% were illiterate. Only 3.2% of patients were graduates or had attained higher educational qualifications. Occupationally, homemakers (17.2%) and laborers (15.6%) represented the largest groups, followed by farmers (12.9%) and unemployed individuals (12.9%). A higher proportion of cases occurred among males than females, indicating a male predominance. Most patients belonged to lower and middle socioeconomic strata.



Figure 1: A 53 years old female patient with lepromatous leprosy demonstrating classical leonine facies characterized by diffuse infiltration and thickening of the facial skin, loss of lateral eyebrows (madarosis), depressed nasal bridge (saddle-nose deformity) and prominent facial furrowing. These findings are characteristic of advanced multibacillary disease with longstanding involvement of the skin and adnexal structures.



Figure 2: Clinical photograph of an 18 years old boy with lepromatous leprosy showing diffuse, symmetrical erythematous infiltrated papules and plaques over the face. Similar lesions were present symmetrically over the trunk and limbs, consistent with generalized cutaneous involvement in lepromatous leprosy.

The clinical and disease-related characteristics of patients are summarized in Table 2. The mean duration of

symptoms at presentation was 11.8 ± 7.4 months and the mean number of skin lesions was 4.6 ± 1.3 . Peripheral nerve involvement was observed in 78.5% of patients. Sensory impairment was present in 90.3% of cases, whereas motor weakness was documented in 19.9%. The ulnar nerve was the most commonly involved peripheral nerve, followed by the common peroneal and posterior tibial nerves.

According to the WHO classification, 59.1% of patients were classified as MB and 40.9% as PB. Within the Ridley–Jopling spectrum, borderline tuberculoid leprosy (25.8%) and lepromatous leprosy (19.9%) were the most frequent clinical types, while mixed and other borderline forms together accounted for 58.1% of cases. Slit-skin smear positivity was observed in 59.1% of patients. Regarding bacteriological index (BI), 40.9% of patients had a BI of 0, whereas positive BI grades were observed in the remaining patients, with BI 3+ being the most common positive category (15.1%).

Lepra reactions were identified in 29.0% of patients. Type I reactions (18.3%) were more common than Type II reactions (10.8%). Disability assessment showed that 58.1% of patients had Grade 0 disability, whereas 41.9% had varying degrees of disability. Deformities were

present in 17.2% of patients. Among patients with deformities, claw hand was the most frequent manifestation (37.5%), followed by madarosis (28.1%), foot drop (25.0%) and trophic ulcers (18.8%). Regarding treatment status, 66.7% of patients were receiving ongoing multidrug therapy (MDT), while 33.3% had completed treatment. Defaulter/relapse cases accounted for 11.3% of patients, whereas isolated relapse was uncommon (0.5%). With respect to treatment outcomes, 30.1% of patients were classified as cured and 69.9% as improving, indicating a favourable clinical response to MDT.

Several demographic and clinical covariates were evaluated in the study, including age, sex, educational status, occupation, socioeconomic status, duration of disease, nerve involvement, bacteriological status, disability grade and lepra reactions. The majority of patients belonged to economically disadvantaged groups and presented with peripheral nerve involvement and sensory impairment. Multibacillary disease predominated and a substantial proportion of patients exhibited lepra reactions and disability at presentation. These findings highlight the continued burden of advanced disease and neurological complications among patients attending the tertiary care center.

Table 1: Socio-demographic characteristics of study participants (n=186).

Variable	Category	N (%) (n=186)
Age group (in years)	≤20	18 (9.7)
	21–30	42 (22.6)
	31–40	39 (21.0)
	41–50	36 (19.4)
	51–60	27 (14.5)
	>60	24 (12.9)
Education level	Illiterate	41 (22.0)
	Primary (≤5th)	48 (25.8)
	Middle School	31 (16.7)
	High School	29 (15.6)
	Intermediate	18 (9.7)
	Graduate & above	6 (3.2)
	Missing	13 (7.0)
Occupation	Labourer	29 (15.6)
	Farmer	24 (12.9)
	Homemaker	32 (17.2)
	Student	18 (9.7)
	Service	21 (11.3)
	Business	14 (7.5)
	Unemployed	24 (12.9)
	Others	24 (12.9)

Table 2: Clinical profile, lepra reactions and disability among patients (n=186).

Variable	Category	N (%) / Mean ± SD
Duration of symptoms (in months)	Mean ± SD	11.8 ± 7.4
Number of skin lesions		4.6 ± 1.3
Nerve involvement	Yes	146 (78.5)

Continued.

Variable	Category	N (%) / Mean $\pm$ SD
Sensory loss	No	40 (21.5)
	Yes	168 (90.3)
	No	18 (9.7)
Motor weakness	Yes	37 (19.9)
	No	149 (80.1)
Type of lepra reaction	No Reaction	132 (71.0)
	Type I	34 (18.3)
	Type II	20 (10.8)
Disability grade	Grade 0	108 (58.1)
	Grade I	46 (24.7)
	Grade II	32 (17.2)
Presence of deformity	Yes	32 (17.2)
	No	154 (82.8)

Table 3: Types of deformities, treatment status and outcomes (n=186).

Variable	Category	N (%)
Type of deformity†	Claw hand	12 (37.5)
	Foot drop	8 (25.0)
	Trophic ulcer	6 (18.8)
	Lagophthalmos	4 (12.5)
	Wrist drop	2 (6.2)
	Madarosis	9 (28.1)
	Wartenberg sign	4 (12.5)
Treatment status	Completed	62 (33.3)
	Ongoing	124 (66.7)
Defaulter/relapse	No	164 (88.2)
	Defaulter	21 (11.3)
	Relapse	1 (0.5)
Outcome	Cured	56 (30.1)
	Improving	130 (69.9)

†????????????????

DISCUSSION

Knowledge and understanding of the epidemiological profile of leprosy remain essential for assessing disease burden, monitoring transmission trends and facilitating effective public health planning. Although substantial progress has been achieved through the implementation of multidrug therapy (MDT), leprosy continues to pose a public health challenge in India. The persistence of new case detection despite declining prevalence indicates ongoing transmission in several endemic regions.^{13,19} The present study was undertaken to evaluate the epidemiological and clinical profile of leprosy patients attending a tertiary care centre in western Uttar Pradesh, a region where contemporary data remain relatively limited. In the present study, the highest proportion of patients belonged to the 21–30 years age group, followed by the 31–40 years and 41–50 years age groups. The predominance of disease among young and middle-aged adults is consistent with previous Indian studies. Mahajan et al, reported that the majority of newly detected patients

were in the economically productive age groups, reflecting continued transmission within the community.¹³

Similarly, Singh et al observed that most patients presenting to a tertiary care centre belonged to the active working-age population.¹⁴ These findings are epidemiologically important because leprosy-related morbidity and disability in this age group can result in significant social, occupational and economic consequences.

A male predominance was observed in our study. Similar gender distributions have been reported in previous studies from India.^{14–16} The higher proportion of male patients may be attributed to greater occupational exposure, increased social mobility and better access to healthcare services. In addition, underreporting among females due to sociocultural barriers and reduced healthcare-seeking behaviour may contribute to the observed gender disparity.¹⁹ The educational and occupational characteristics of the patients further highlight the association of leprosy with socioeconomic

disadvantage. A substantial proportion of patients were either illiterate or had only primary-level education, while labourers, farmers, homemakers and unemployed individuals constituted major occupational groups. These findings are consistent with the continued concentration of leprosy among economically vulnerable populations and emphasize the influence of social determinants on disease occurrence, delayed diagnosis and healthcare access.¹⁹ Peripheral nerve involvement was present in the majority of patients, with sensory impairment being the most common neurological manifestation. The ulnar nerve was the most frequently affected nerve, followed by the common peroneal and posterior tibial nerves. Nerve involvement is a hallmark of leprosy and is responsible for much of the disability associated with the disease.¹⁸ Polycarpou et al emphasized that immune-mediated nerve damage remains central to the pathogenesis of leprosy and is the principal cause of long-term morbidity.¹⁸ The high prevalence of nerve involvement observed in our study underscores the importance of early diagnosis and timely initiation of MDT to prevent irreversible neurological impairment.

MB leprosy constituted the majority of cases in the present study, while PB disease accounted for a smaller proportion. Similar observations have been reported by Singh et al and Sonkar et al who documented a predominance of MB disease among patients attending tertiary care centres.^{14,15} The higher frequency of MB cases may reflect delayed diagnosis, referral bias and the tendency of tertiary care facilities to receive more advanced disease. According to the revised national leprosy eradication programme (NLEP) guidelines, accurate classification of patients into PB and MB categories remains critical for determining appropriate treatment and monitoring outcomes.¹⁷

Within the Ridley–Jopling spectrum, borderline tuberculoid leprosy was the most common subtype observed in our study. This finding is in agreement with several hospital-based studies from India that have reported borderline forms as the predominant clinical presentation.¹⁴⁻¹⁶ The immunological instability characteristic of borderline disease contributes to its clinical heterogeneity and predisposition to reactional episodes.¹⁸

Leprea reactions were observed in a considerable proportion of patients, with Type I reactions occurring more frequently than Type II reactions. Reactional states remain a major cause of acute nerve damage and disability in leprosy.¹⁸ Sonkar et al similarly reported that Type I reactions were more common than Type II reactions among affected patients.¹⁵ The relatively high frequency of reactions in our study may be explained by the tertiary care setting, which often receives referrals of patients with complicated or severe disease. Disability continues to represent an important indicator of delayed diagnosis and disease burden. In the present study, a substantial proportion of patients had disability at

presentation, while deformities such as claw hand, foot drop, trophic ulcers and madarosis were also observed. Similar findings have been reported by Bishnoi et al who documented deformities and trophic complications among patients presenting with advanced disease.¹⁶ The occurrence of disability reflects ongoing challenges in early case detection and highlights the need for regular neurological assessment, patient education and timely intervention to prevent permanent functional impairment.¹⁸ With respect to treatment outcomes, a proportion of patients had completed treatment and were classified as cured, while the remainder were improving on ongoing MDT. The effectiveness of MDT in reducing disease burden, preventing relapse and interrupting transmission has been well established.^{19,20} Continued adherence to treatment protocols and close follow-up remain essential for achieving optimal outcomes and minimizing complications.¹⁷

From a public health perspective, surveillance and reporting remain crucial components of leprosy control programmes. Despite considerable progress, underreporting and delayed diagnosis continue to impede elimination efforts in several regions of India.¹⁹ Cases managed outside government health facilities may not always be captured adequately, leading to underestimation of the true disease burden. Strengthening surveillance systems, promoting early case detection, ensuring complete notification from all healthcare sectors and maintaining high-quality MDT services are essential for sustaining progress toward leprosy elimination goals.^{17,19}

This study provides a comprehensive overview of the epidemiological and clinical profile of leprosy patients in western Uttar Pradesh, including demographic, clinical, neurological, reactional, disability, treatment and outcome parameters. However, its retrospective design may be subject to incomplete records and information bias. Being a single-centre, tertiary care-based study with convenience sampling, the findings may not be fully generalizable and may overrepresent severe cases. Additionally, the descriptive design precluded assessment of causal associations and predictors of outcomes. Further multicentric prospective studies with larger sample sizes are needed to evaluate epidemiological trends, determinants of disability, delayed diagnosis and long-term treatment outcomes.

This retrospective, record-based study was limited by the accuracy and completeness of hospital records, with the possibility of missing data and information bias. As it was conducted at a single tertiary care center using convenience sampling and a relatively small sample size, selection bias may have occurred, limiting the generalizability of the findings. The observational design also precluded assessment of causal relationships. Larger prospective multicentric studies with longitudinal follow-up are needed to validate these findings.

CONCLUSION

This study demonstrates that leprosy continues to predominantly affect individuals in the economically productive age group, with a high burden among those from lower socioeconomic and educational backgrounds. The predominance of multibacillary disease, peripheral nerve involvement and disability at presentation suggests delayed diagnosis and ongoing transmission in the community.

MDT yielded favourable treatment outcomes, confirming its effectiveness; however, defaults and relapses highlight the need for improved counselling, adherence and follow-up. Strengthening community awareness, active surveillance, contact screening and healthcare worker training can facilitate earlier diagnosis and reduce disability. Enhanced notification systems and comprehensive MDT coverage are essential for effective disease control. The findings may help guide targeted interventions and leprosy control strategies, while further multicentric prospective studies are needed to better understand disease trends and outcomes.

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REFERENCES

1. Agrawal N, Saha TR, Barua JK, Banerjee G, Chatterjee K, Halder S, et al. Clinico-epidemiological study of leprosy in a tertiary care hospital of Eastern India. *Int J Res Dermatol*. 2023;9:96-102.
2. Karotia D, Kishore J, Kumar A. Epidemiological determinants of leprosy in a high endemic district of India: A community based case control study. *Indian J Lepr*. 2022;94:69-80.
3. Singal A, Sonthalia S. Leprosy in post-elimination era in India: Difficult journey ahead. *Indian J Dermatol*. 2013;58:443-6.
4. Geetharani G, Pavithra G, Sathesh P. Clinico epidemiological study of untreated multibacillary leprosy patients visiting a tertiary care hospital in Madurai. *Indian J Lepr*. 2018;90:197-206.
5. Adil M, Amin SS, Mohtashim M, Mushtaq S, Alam M, Priya A. Clinico-epidemiological study of leprosy from a North Indian tertiary care hospital. *Int J Res Dermatol*. 2018;4:518-21.
6. Jindal N, Shanker V, Tegta GR, Gupta M, Verma GK. Clinico-epidemiological trends of leprosy in Himachal Pradesh: a five-year study. *Indian J Lepr*. 2009;81:173-9.
7. Gupta R, Sinha R, Pradhan S. Clinico-epidemiological profile of leprosy in post-elimination era: a hospital-based study. *Indian J Lepr*. 2019;91:197-205.
8. Rathod SP, Jagati A, Chowdhary P. Disabilities in leprosy: an open, retrospective analysis of institutional records. *An Bras Dermatol*. 2020;95:52-56.
9. Kurup R, Haynes U, Mentore G. A study on trends and patterns of leprosy in Guyana during a ten-year period, 2007–2016. *Indian J Lepr*. 2018;90:207-16.
10. Tiwary PK, Kar HK, Sharma PK. Epidemiological trends of leprosy in an urban leprosy centre of Delhi: a retrospective study of 16 years. *Indian J Lepr*. 2011;83:201-8.
11. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Lancet*. 2007;370(9596):1453-7.
12. IBM Corp. IBM SPSS Statistics for Windows, Version 25.0. Armonk (NY): IBM Corp.; 2017.
13. Mahajan VK, Sharma NL, Rana P. Trends in detection of new leprosy cases at two centres in Himachal Pradesh, India: a ten-year study. *Indian J Lepr*. 2003;75:17-24.
14. Singh AL, Vagha SJ, Agarwal A. Current scenario of leprosy at tertiary care level hospital of rural central India. *Indian J Dermatol Venereol Leprol*. 2009;75:520-2.
15. Sonkar VK. A clinico-epidemiological study of leprosy in a tertiary care centre. *Int J Curr Adv Res*. 2018;7:14350-53.
16. Bishnoi S, Verma A, Nijhawan M, Bagri M, Nijhawan S, Sharma A. Leprosy. *Gulf J Dermatol Venereol*. 2019;26:1-5.
17. Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India. National Leprosy Eradication Programme (NLEP): Revised classification and treatment protocol effective April 1, 2025. New Delhi: Ministry of Health and Family Welfare. 2025.
18. Polycarpou A, Walker SL, Lockwood DNJ. New findings in the pathogenesis of leprosy and implications for the management of leprosy. *Curr Opin Infect Dis*. 2013;26:413-9.
19. Pandey A. Current perspectives on leprosy as a public health challenge in India. *Res Rep Trop Med*. 2015;6:43-8.
20. Talhari S, Grossi MA, Oliveira MLW, Gontijo B, Talhari C, Penna GO. Hansen's disease: a vanishing disease. *Mem Inst Oswaldo Cruz*. 2012;107(1):13-6.
21. Rees RJW, Young DB. The microbiology of leprosy. In: Hastings RC, editor. *Leprosy*. 2nd ed. New York: Churchill Livingstone. 1994: 49-83.

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