



Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/16422
DOI URL: <http://dx.doi.org/10.21474/IJAR01/16422>



RESEARCH ARTICLE

RISING TREND OF HANSEN'S DISEASE: A 5 YEAR RETROSPECTIVE STUDY IN A TERTIARY CARE HOSPITAL

Dr. Ruchita Gadhe¹, Dr. Sunita Gajbhiye², Dr. Sangeeta Bhalavi³, Dr. Sunanda Shrikhande⁴ and Dr. Jayesh Mukhi⁵

1. Junior Resident, Government Medical College, Nagpur, Maharashtra, India.
2. Associate Professor, Government Medical College, Nagpur, Maharashtra, India.
3. Associate Professor, Government Medical College, Nagpur, Maharashtra, India.
4. Professor and Head (Dept. of Microbiology, GMC, Nagpur), Government Medical College, Nagpur, Maharashtra, India.
5. Associate Professor (Dept. of Dermatology, Venerology and Leprosy, GMC, Nagpur), Government Medical College, Nagpur, Maharashtra, India.

Manuscript Info

Manuscript History

Received: 10 January 2023

Final Accepted: 14 February 2023

Published: March 2023

Key words:-

Leprosy, Hansen's disease,
Multibacillary, Paucibacillary

Abstract

Introduction: Leprosy or Hansen's disease is caused by *Mycobacterium Leprae*. It is a chronic granulomatous and infectious disease primarily affecting the skin and peripheral nerves. Case detection rates are still high indicating active transmission. This study was conducted to analyze the trends in leprosy over a period of five year in a tertiary care hospital, Central India.

Methods and Materials: Slit skin smear were taken as per standard protocol from patients attending outpatient Department of Dermatology (Venerology and leprosy) from a tertiary care hospital in Central India. Medical records of clinically diagnosed Hansen's patients were collected retrospectively between January 2018 to December 2022.

Results: A total 2166 cases of slit skin smear positive for acid fast bacilli was seen in 37.30%. A slow but steady rise in leprosy cases has been noted. In the year 2022, there were maximum number of new cases detected which were 244 accounting for 48.03%. Males 492 (60.89%) outnumbered females 316 (39.11%). The majority of the participants 486 (60.15%) were between the ages of 21 to 40. Maximum number of cases 669 (82.79%) found to have bacteriological index between 1+ to 3+. Of newly diagnosed leprosy cases, 378 (46.79%), had MI between 1 to 25. Multibacillary patients constituted 436 (53.96%) while 372 (46.03%) were paucibacillary patients.

Conclusion: The leprosy programs have brought down the cases but pockets of active transmission exist in some areas. Early case detection, early institutional visit, enhancing active health education and interventions for leprosy are forwarded to eliminate disease. Detection of high number of cases signifies increased burden of Hansen's diseases in this area even in the post elimination era.

Copy Right, IJAR, 2023, All rights reserved.

Corresponding Author:- Dr. Ruchita Gadhe

Address:- Junior Resident, Government Medical College, Nagpur, Maharashtra, India.

Introduction:-

Mycobacterium leprae is the pathogen responsible for Hansen's disease or leprosy, it was discovered in 1873 by GA Hansen and it is transmitted through droplet contact.¹ Leprosy is one of the few infectious diseases with a long incubation period that affects both the skin and peripheral nerves.² The National Leprosy Control Programme was launched in 1954 in India and converted to National Leprosy Eradication Programme in 1983 with objective to eliminate leprosy. Up until 1940, there was no cure for the illness. India adopted multi drug therapy in 1982, and with its assistance, the country eliminated leprosy in December 2005.³

As per Annual New Case Detection Rate (ANCDR) in India prevalence rate was observed as 0.41 per 10,000 population in 2020-21. New case detected in Maharashtra from January 2021-October 2021 were 8639 with prevalence rate of 0.69.⁴ According to the World Health Organization (WHO) weekly epidemiological report of 2020, mentioned that out of 202,189 new cases reported globally, 114,451 (57%) are contributed by India.⁵ India has the highest leprosy burden, according to data on global leprosy rates. Although the disease is widespread across the nation, its distribution is not even.¹

As there is still widespread ignorance of the disease, inadequate active case detection, exclusion of cases from the private sector, and a high level of stigma in the community, the actual number of those affected by the disease is likely to be much greater than statistics.⁷ Paucibacillary cases may have role in transmission, multibacillary cases have higher potential of spreading disease. Due to insidious onset and asymptomatic nature of diseases in these patients, diagnosis is delayed further.⁸ This study aims to describe the trends of newly detected leprosy patients in a tertiary care hospital in the period ranging from 2018 to 2022.

Material and Methods:-**Study design**

5 years retrospective study between January 2018 to December 2022 was undertaken.

Study population

Detail records were obtained of all patients with the clinical manifestation of Hansen disease registered in department of Dermatology, Venereology and Leprosy in tertiary care hospital, central India. Patients who were diagnosed previously and taking treatment were excluded from this study. A total of 2166 patients samples received in Microbiology laboratory during study period.

Procedure:-

Slit skin smear examination for acid-fast bacilli was routinely used in the laboratory setting for all the clinically suspected cases to confirm the diagnosis of leprosy. Smear were made from three sites- ear lobe, eyebrow, active lesion. These smears were then stained with modified Ziehl-Neelsen stain and examined under oil immersion to look for acid-fast bacilli (AFB) both intra and extra-cellular and reported as positive or negative for AFB.^{9,10,11}

Patients were classified according to Ridley Jopling classification and treated accordingly.¹² As per the World Health Organization (WHO 2002) the diseases were classified as multibacillary or paucibacillary type.¹³ Age, gender, type of leprosy, bacteriological index and morphological index was noted in this study.

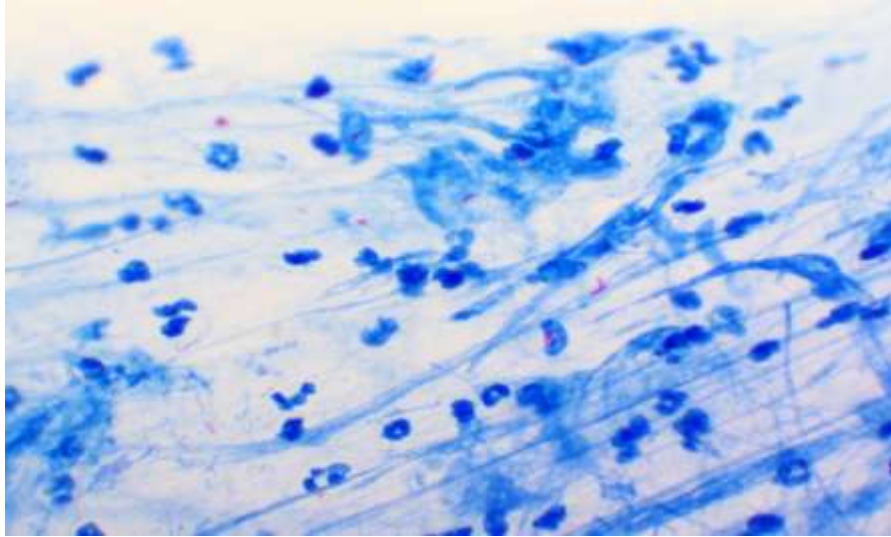


Fig 1:- Acid fast bacilli seen in slit skin smear of leprosy.

Table 1:- Ridley's logarithmic scale for Bacteriological Index¹²

Bacteriological index	Number of bacilli in 100 oil-immersion field
6+	Many clumps of bacilli in an average field (over 1000)
5+	100-1000 bacilli in an average field
4+	10-100 bacilli in an average field.
3+	1-10 bacilli in an average field.
2+	1-10 bacilli in 10 fields.
1+	1-10 bacilli in 100 fields

Morphological index¹²

Morphological index is the percentage of solid uniformly stained bacilli in a stained smear.

The following criteria were used for calling the bacilli solid rods are

- Uniform staining of the entire organism
- Parallel sides
- Rounded ends, and
- Length 5 times that of the width.

Results:-

Year wise distribution of cases

A total of 808 new leprosy cases were reported over the course of the five-year study. Table 2 displays the distribution by year. From the year 2018 through 2022, a slow but steady rise in leprosy cases has been noted. In the year 2022, there were maximum number of new cases detected which were 244 accounting for 48.03%.

Gender wise distribution of cases

Table 3 shows that of the 808 cases, 492 (60.89%) were male and 316 (39.11%) were female. In the current study, a male majority of leprosy cases was found.

Age wise distribution

As a result of retrospective analysis on different age groups, maximum numbers of leprosy cases 486 (60.15%) were found between the age group of 21-40 years (Table-3). Next age groups who are more prone to affect with the disease were the people with age of above 40 years which is 17.33%. The least percentage with 1.3% of the population developing the disease were with less than 10 years of age group.

Bacteriological index (BI)

From the table 4, it is observed that among 808 cases, 669 (82.79%) had BI between 1+ and 3+. Whereas, 139 (17.20 %) had BI greater than 3+.

Morphological index (MI)

Table 5 shows that majority of newly diagnosed leprosy cases, 378 (46.79%), had MI between 1 to 25. Least number of cases 79 (9.77%) had MI of greater than 50.

WHO classification

From the table 6, Multibacillary type leprosy was the most frequent clinical form observed affecting 436 (53.96%) cases, while paucibacillary type leprosy affected 372 (46.03%) cases.

Table 2:- Year-wise distribution of new leprosy cases (n=2166).

Year	Total samples received	Positive cases (%)
2018	536	210 (39.17)
2019	437	153 (35.01)
2020	278	126 (45.32)
2021	407	172 (42.26)
2022	508	244 (48.03)
Total	2166	808 (37.30)

Table 3:- Age and gender wise distribution of new leprosy cases (n= 808).

Age	Male	Female	Total Positive (%)
1-10	8	3	11(1.37)
11-20	100	51	151 (18.68)
21-30	170	102	272 (33.67)
31-40	118	96	214 (26.48)
41-50	82	58	140 (17.33)
>50	14	6	20 (2.47)
Total (%)	492(60.89%)	316(39.11%)	808 (100)

Table 4:- Bacteriological index of new leprosy cases (n=808).

Bacteriological index	Number (%)
1+	290 (35.89)
2+	218 (26.98)
3+	161 (19.93)
4+	73 (9.03)
5+	49 (6.06)
6+	17 (2.11)
Total	808 (100)

Table5:- Morphological distribution of new leprosy cases (n=808).

Morphological index	Number (%)
0	166 (20.54)
1-25	378 (46.78)

26-50	185 (22.89)
>50	79 (9.77)
Total	808 (100)

Table 6- Types of leprosy cases according to WHO classification (n=808)

Gender	Multibacillary type	Paucibacillary type
Males	223	269
Females	213	103
Total (%)	436 (53.96%)	372 (46.03%)

Discussion:-

Leprosy is still elusive despite the diligent efforts of several organizations and individuals.¹⁴ Leprosy diagnosis and classification are crucial for effective, prompt case management and disability prevention.

Annual new case detection was analysed year wise. A total of 808 (37.30%) new leprosy cases were registered during the period of 2018 -2022. Similar findings observed in a study conducted by Kilikdar et al.⁶ who observed 34.66% cases diagnosed as smear positive for acid fast bacilli. Maximum number of cases were 244 (48.03%) in the year 2022. (Table2)

In the present study, 492 (60.89%) were males and 316 (39.11%) were female patients (Table 3). This finding was near to the study conducted by Thimmappa et al.¹⁵ who found 56% were males and 44% were females. Another study conducted by Dimri et al.¹⁶ found males constituted 62.8% of all leprosy cases. This can be explained as a fact that males go for outdoor work more compared to females hence have the higher chance of getting the infection. Male preponderance may also be due to difference in health seeking behavior of men and females are slow to self-report.¹⁷ More stringent screening and targeted strategies are necessary if the objective of increasing the detection of female cases is to be accomplished.⁸

The percentage of children affected in our study was 1.37 % (Table 3). Similar finding observed in a study conducted by Manthant al.¹⁸ who reported 1.91% of children. In the current study, 486 (60.15%) of cases were found to be affected between the age group of 21-40 years. A study conducted by Thyvalappillet al.² and Jindal et al.¹⁴ also found that the major age range impacted was between 20 to 40 years old. Thus, the age incidence observed in the present study correlates well with that of the other studies. This male predominance can be attributed to more of outdoor activities in search of livelihood leading to a higher chance of them contracting the infection and better opportunities for health care.¹

In the current study, 669 (82.79%) patients had bacteriological index between 1+ and 3+ (Table 4). Similar findings observed in a study conducted by Kauret al.¹⁹ and Patil et al.¹² which showed that majority of leprosy cases lies in between the BI of 1+ to 3+. These indices help to assess the state of patients at the beginning of treatment and to assess the progress.¹² The 1+ bacteriological index denotes low bacillary load and better prognosis, while high BI (5+ & 6+) having high bacillary load, highly infectious and are more likely to transmit the diseases in community.

In the present study, cases found to have morphological index between 1 to 25 were 378 (46.79%) (Table 5). A study conducted by Patil et al.¹² had near about similar findings with 43.75% smear positive cases. MI of <25 indicates low viable bacilli, low infectivity, and better response to treatment.¹²

Majority of the new leprosy cases in our study had multibacillary (MB) type 436 (53.96%), as opposed to 372 (46.03%) paucibacillary cases (Table 6). Patients with these multibacillary forms of the disease are considered the major source of infection. MB predominance has also been reported in studies conducted by Suma et al.¹ as 53% and Mohite et al.²⁰ as 53.6% respectively. A significant observation was a greater number of multibacillary leprosy cases, which is due to delay in diagnosis and initiation of treatment.

In spite of all the initiatives taken by the National leprosy eradication programme (NLEP), a decline in the occurrence of new leprosy cases in India has not occurred over the last decade. The possibility of acquiring leprosy for individuals within the family is 5-10 times higher for multibacillary patients, and 2-3 times higher with paucibacillary patients than for people not living in such households.²¹ These undiagnosed cases and subclinical infections in contacts contribute a considerable proportion of all new leprosy cases. Case detection campaigns and contact tracing programme would unquestionably reduce this disease burden.¹

Conclusion:-

Although leprosy has been eliminated at the national level, areas of endemicity exist where the transmission continues to be high. Our study showed the rising trend of leprosy in a tertiary care hospital. In order to continue elimination, contact screening and referral activities must be stepped up in the community. The number of MB cases has increased in comparison to PB cases. It also highlights the need for early diagnosis and appropriate treatment at the field level to prevent the further spread.

Bibliography: -

1. Suma Nalamada et al. Incidence and clinical profile of leprosy in a tertiary care hospital in Hyderabad, Telangana. *International Journal of Contemporary Medical Research* 2018;5(10).
2. Joy B, Radhakrishnan K. Current trends of leprosy in a tertiary care centre in North Kerala: A 10-year observational retrospective study. *Indian J Lepr.* 2019; 91:175-83.
3. Rattan R, Tegta GR, Sharma A, Chauhan M. A 10-year retrospective analysis of Hansen's disease patients in an urban leprosy centre of Himachal Pradesh. *International Journal of Community Medicine and Public Health.* 2017 Jul;4(7):2470.
4. NLEP Annual Report 2020-2021 Central Leprosy Division, Directorate General of Health Services, Ministry of Health and Family Welfare Government of India, Nirman Bhavan, New Delhi. 2021.
5. Rao PN. Leprosy: The challenges ahead for India. *Journal of Skin and Sexually Transmitted Diseases.* 2021 Oct 14;3(2):106-10.
6. Kilikdar M, Gedam D, Pisey A, Ambhore N, Karykate R. Leprosy Profiles in Post Elimination Stage: Experience at A Tertiary Care Hospital. *National Journal of Integrated Research in Medicine.* 2018 Mar 1;9(2).
7. Kabir H, Hossain S. Knowledge on leprosy and its management among primary healthcare providers in two districts of Bangladesh. *BMC Health Serv Res.* 2019;19(1):787.
8. Geetharani, G. & Pavithra, G. & Sathesh, P (2018). Clinico-epidemiological study of untreated multibacillary leprosy patients visiting a tertiary care hospital in Madurai. *Indian Journal of Leprosy.* 90. 197-206.
9. Croft RP, Smith WC, Nicholls P, Richardus JH. Sensitivity and specificity of methods of classification of leprosy without use of skin smear examination. *Int J Lepr.* 1998; 66:445-50.
10. Groenen G, Saha NG, Rashid MA, Hamid MA, Pattyn SR. Classification of Leprosy Cases under Field Conditions in Bangladesh: I, Usefulness of Skin-Smear Examination. *Lepr Rev.* 1995; 66:26-33.
11. Srinivas D, Rao PN, Lakshmi TS, Suneetha S. Bacterial index of granuloma and its relevance compared to BI of skin smears. *Lepr Rev.* 2002; 73:79-80.
12. Patil AS, Mishra M, Taiwade P, Shrikhande S. A Study of Indices in Smear Positive Leprosy in Post-Elimination Era: Experience at a Teaching Tertiary Care Centre. *MAMC J Med Sci* 2020; 6:211-5.
13. Report of the third meeting of the WHO technical advisory group on the elimination of leprosy. WHO/CDS/CPE/CEE/2002; Geneva: WHO; 2002.
14. 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 Oct 1;81(4):173-9.
15. Thimmappa RM, Deshpande SS, Maheshwarappa Y, Ramesh RY. A clinical study of new cases of Hansen's disease at a tertiary health care centre in post elimination era. *Int J Res Dermatol* 2021; 7:418-22.
16. Dimri D, Gupta A, Singh AK. Leprosy continues to occur in hilly areas of North India. *Dermatology Research and Practice.* 2016 Jan 24;2016.
17. Swarnakumari G, Narasimha Rao TV, Ngeswaramma S, Vani T, Rammohan CH, Neenavathu RN. A study of clinical profile of leprosy in post leprosy elimination era. *IOSR J Dent Med Sci.* 2015 Nov; 14:04-12.
18. Mathan R, Devan KM. Incidence and Clinical Profile of Leprosy in a Tertiary Care Hospital: A Retrospective Study. *Int J Sci Stud* 2016;4(3):178-179.
19. Kaur S, Kumar B, Gupta SK. Fine needle aspiration of lymph nodes in leprosy: A study of bacteriologic and morphologic indices. *Int J Lepr.* 1977 Oct 1; 45:369-72.

20. Mohite RV, Durgawale PM. Evaluation of national leprosy eradication programme in Satara District, Maharashtra. Indian J Lepr 2011; 83:139-43.
21. World Health Organization. World Health Organization Expert Committee on Leprosy. World Health Organ Tech Rep Ser, 2012; 968: 1-61.