
ORIGINAL ARTICLE**Leprosy, still a burden! A retrospective study in a tertiary health care centre over recent 5 years**

Ritu Gujarati Vishwanath¹, Prasad Naik NM^{2*}, Shankar Kunti², N Sudheer², Yashashree Dungarwal²

¹Consultant Dermatologist, RiVa Skin and Plastic Surgery Clinic, Warangal-506001 (Telangana),

India, ²Department of Dermatology Venereology and Leprosy, Osmania Medical College/General Hospital, Hyderabad-500095 (Telangana), India

Abstract

Background: Leprosy is a chronic mycobacterial infection. It presents with wide clinical variations. We come across many active and old cases in this area. *Aim and Objectives:* To analyse the clinical trend in Hansen's disease over five years in a tertiary health care centre. *Material and Methods:* This is an observational retrospective record-based study. The duration of study was five years starting from April 2015 to March 2020. It included the data of leprosy patients who were registered in the Department of Dermatology, Venereology, Leprology in a tertiary health care centre. *Results:* A total of 1183 leprosy cases were seen. Most of the patients were aged 21-30 years 382 (32.2%), youngest being six years. Males exceeded females 828 (69.9%). There were 1046 new cases (88.41%). Borderline tuberculoid was the most common presentation 440 (37.19%). Multibacillary leprosy constituted 1138 (96.1%), 33 of them were children. Deformities were seen in 84 cases (7.1%), predominantly in borderline tuberculoid spectrum 45/84 cases, (53.5%), claw hand 38 cases (3.21%) being most common. 60 (5.07%) of cases had reactions (Type 1 reaction, 1.52% < Type 2 reaction, 3.55%). *Conclusion:* Though India is in post elimination era of leprosy, multibacillary leprosy is still prevailing, being maximum in year 2019-2020, 340 (28.74%). Thirty three of them were children. This shows active transmission among our population and should be an area of concern to health care facilities and policy makers.

Keywords: Clinical trends, Hansen's disease, Leprosy

Introduction

Leprosy is one of the oldest diseases prevalent in the world. It is caused by infection due to Mycobacterium leprae with an incubation period ranging from months to years [1]. The accepted definition of leprosy as per 7th WHO Expert Committee on Leprosy (World Health Organisation, 1998) is, a person having one or more of the following features, and who is yet to complete the full course of treatment: hypopigmented or reddish skin lesion(s) with definite loss of sensation, nerve thickening with sensory impairment and skin smear positive for acid fast bacilli [2].

Leprosy is a disease of concern in developing countries including India. The National Leprosy Eradication Programme (NLEP) is the centrally sponsored health scheme of the Ministry of Health and Family Welfare, Government of India. The programme is supported by WHO, ILEP (International Federation of Anti Leprosy Associations), and few other non-governmental organizations. Due to their efforts, from a prevalence rate of 57.8/10,000 in 1983, India has succeeded with the implementation of Multi Drug Therapy (MDT) in bringing the national prevalence down to “elimination as a public

health problem” of less than 1/10,000 in December 2005 [3].

After attainment of elimination figure of <1/10,000 in December 2005, there was a quick integration of the vertical NLEP program with the general health services. A chronic disease, such as leprosy, which has a long incubation period is expected to have many individuals in the population who will be incubating the disease for many years before they become clinical cases [4]. In reassessment of leprosy situation in 2013, WHO realized that the declaration of elimination in 2000 was premature and it was hindering rather than helping leprosy control [5].

As per NLEP Annual report 2015-16, the year started with 0.88 lakh leprosy cases on record as on 1st April 2015, with Prevalence Rate (PR) 0.69/10,000. A total of 127334 new cases were detected during the year 2015-16, which gives Annual New Case Detection Rate (ANCDR) of 9.71 per 100,000 population, as against 125785 cases in 2014-15. This shows decrease in ANCDR by 0.02% from 2014-15 (9.73). Thirty four States/UTs had achieved the level of elimination i.e., PR less than 1 case per 10,000 population and Telangana was one among them [6]. A new initiative, “Triple Zero Campaign” was introduced in 2016 by ILEP and later endorsed by WHO aiming; achievement of zero transmission of disease, zero new cases of childhood disability, zero stigma and discrimination by 2020 [7]. Later, WHO launched a five year “Global leprosy strategy 2016-2020: Accelerating towards a leprosy free world” [3]. ANCDR showed a rising trend from 9.71/100000 in 2016 to 10.12/100000 in 2017[8]. NLEP attributes this high number to initiatives like Leprosy Case Detection Campaign (LCDC), Focussed Leprosy Campaign (FLC),

ASHA Based Surveillance for Leprosy Suspects (ABSULS) and SPARSH Leprosy Awareness Campaign (SLAC) [3]. Leprosy showed resurgence in many parts of world including India. It was realized that the Triple Zero goals were unattainable in near future and the targets were pushed from 2020 to 2030 [7].

According to Weekly Epidemiological Record August 2019, WHO South East Asia Region reported 71% of all global cases: 2 countries – India (120334 cases) and Indonesia (17017 cases) contributed 92% of the cases in that region. Combined, Brazil, India and Indonesia accounted for 79.6% of all the new cases detected globally. India, which had the highest burden of the disease, reported a decreasing number of new cases by nearly 15000 cases (135485 in 2016 to 120334 in 2017–2018). India has also reported reductions in the numbers of new G2D (Grade 2 Disability) cases, from 5245 to 3666, and of new paediatric cases, to less than 10000 (9227) from more than 10000 previously. This has been largely the outcome of the country's national leprosy programme conducting active case detection campaigns with the involvement of female community health volunteers, resulting in high coverage [9].

Dermatologists are generally the points of first contact for a patient of leprosy with skin lesions. Opinion of the dermatologists has been considered important in the past and will continue to be so in the future. This study, done in the Dermatology, Venereology and Leprology (DVL) department, aims at observing the clinical trends and patterns among the leprosy cases over recent past five years (starting from April 2015 to March 2020) in a tertiary health care centre.

Material and Methods

This is an observational retrospective record-based study. The duration of study was five years starting from April 2015 to March 2020. Ethical clearance was taken from the institutional committee. It included the data of patients who visited the department of DVL and were diagnosed with Hansen's disease. Patients were categorized according to age, gender, residence, Multibacillary (MB) or Paucibacillary (PB) type of leprosy, clinical spectrum, reactions and deformity. Bacteriological and morphological indices were noted along with the type of blister pack of MDT issued. It also included patients who were diagnosed outside this centre but given MDT here. All results were entered in MS Excel (2011) and statistically analysed using IBM SPSS software (Inc., Chicago, Illinois, USA).

Chi square test was applied to compare associations. P value <0.05 was considered statistically significant.

Results

A total of 1183 Hansen's disease cases were seen in five years of duration. Youngest age was 6 years and the oldest was 88 years. Maximum number of patients were aged 21-30 years 382 (32.29%) and the least between 81-90 (0.08%) (Table 1). Male patients exceeded females 828 (69.9%).

Most of the patients were residents of Hyderabad and Rangareddy district. Very few of the cases were migrants from Andhra Pradesh, Bihar, Maharashtra, Orissa, Karnataka and Delhi 20/1183

(1.69%). There were 1046 new cases (88.41%) and 137 old cases. Majority of them were MB 1138 (96.1%) cases (Males 797 >females 341), 33 of them were children. Slit Skin Smears (SSS) were negative in 610 (51.56%) of cases (413 males and 197 females). Bacteriological Index (BI) was between 3.1 and 4 in 189 (15.97%) of SSS positive patients (Table 2). Morphological index was 1-5 among majority of cases (Table 3).

Table 1: Age distribution among cases

Age in years	Number of patients	Percentage (%)
1-10	9	0.76
11-20	163	13.77
21-30	382	32.29
31-40	278	23.49
41-50	184	15.55
51-60	106	8.96
61-70	55	4.64
71-80	5	0.42
81-90	1	0.08
Total	1183	100

Table 2: Bacteriological indices

Bacteriological index	Number of patients		Percentage (%)
0	610		51.56
0.1-1	18		1.52
1.1-2	82		6.93
2.1-3	105		8.87
3.1-4	189	Borderline Lepromatous - 67	15.97
		Lepromatous - 120	
		Histoid - 2	
4.1-5	55		4.64
5.1-6	1		0.08
Unrecorded	123 old cases		10.39

Table 3: Morphological indices

Morphological index	Number of patients		Percentage (%)
1-5	172	Midborderline-8	14.53
		Borderline Lepromatous-69	
		Lepromatous-92	
		Histoid-3	
6-10	26	Borderline Lepromatous-4	2.19
		Lepromatous-22	
>10	1	Lepromatous	0.08

Clinical Spectrum

The clinical spectrum of Hansen's disease was wide including Tuberculoid (TT), Borderline Tuberculoid (BT), Mid Borderline (BB), Borderline Lepromatous (BL), Lepromatous (LL), histoid,

indeterminate, pure neuritic cases. Borderline tuberculoid was the most common presentation 440 (37.19%) followed by LL 238 (20.11%), BL 238 (20.11%), TT 183 (15.4%) and so on (Table 4).

Table 4: Clinical spectrum among the cases

Spectrum of the disease	Subtypes	Number of patients	Percentage (%)
Tuberculoid (TT)		183	15.46
Borderline Tuberculoid (BT)		440	37.19
Mid Borderline (BB)		28	2.36
Borderline Lepromatous (BL)	Total	238	20.11
	BL	236	0
	BL with dapsone hypersensitivity syndrome	2	0
Lepromatous Leprosy (LL)		238	20.11
Granulomatous chelitis		2	0.16
Histoid		8	0.67
Indeterminate		33	2.78
Pure Neuritic		9	0.76
Released From Treatment (RFT)		4	0.33
Total		1183	

Reactions

Reactions were seen in 60 (5.07%) of cases. These included Type 1 (T1R) and Type 2 reactions (T2R). Type 1 reaction or Reversal Reactions (RR) were seen in a total of 18 cases (1.52%), predominantly in BT type 14/18 cases (77%) followed by BL and TT leprosy. Type 2 reaction or Erythema Nodosum Leprosum (ENL) was seen in 42 cases (3.55%). Most common spectrum was LL leprosy 30/42 cases (71.4%) followed by BL leprosy (Table 5).

Deformities

Various types of deformities were seen in 84 cases (7.1%). Most common was claw hand 38 cases,

(3.21%) followed by trophic ulcers 14 cases (1.18%). These were predominantly seen in BT 45/84 cases (53.5%) and TT spectrum 11/84 cases (13.09%). A few patients had more than one type of deformity (Table 6).

Childhood Leprosy

Leprosy in children is a marker of active transmission in the community. Thirty-seven (3.12%) of cases were children (33 MB and 4 PB). Males exceeded females even among children 20/37 (54.05%). Clinical spectrum was BT in majority 16/37 (43.2%) followed by TT in 12/37 (32.4%) of cases. Only two children with TT and

BT spectrum had deformity. Child cases were highest in 2016/17 (10) and least in 2018/19 (4). Maximum number of cases were seen in 2019/20, 340 (28.74%). Deformities were maximum in 2019/20.

Table 5: Types of reactions and the clinical spectrum

Type of reaction	Subtype	Number of patients	Percentage (%)
T1R (Type 1 Reaction)	Tuberculoid	1	
	Borderline tuberculoid	14	
	Borderline lepromatous	2	
	Released from treatment	1	
	Total	18	1.52
T2R (Type 2 Reaction)	Borderline lepromatous	9	
	Lepromatous	30	
	Released from treatment	3	
	Total	42	3.55
Total		60	5.07

Table 6: Types of deformities

Type of deformity	Number of patients	Percentage (%)
Claw hand	38	3.21
Trophic ulcers	14	1.18
Foot drop	10	0.84
Lagophthalmos	1	0.08
Wrist drop	1	0.08
Pigmentation	1	0.08
Deformity (type unmentioned)	19	1.6
Total	84	7.1

Discussion

According to National Leprosy Eradication Programme (NLEP) monthly progress report for the year 2014-15, total leprosy cases on record were 2045. Number of new cases detected were 2800 among which 982 were PB and 1818 were MB cases. Among the newly detected cases in children, 88 (3.14%) were MB, PB 102 (3.64%) and total 190 (6.79%). Grade II deformity was present in 189 (6.75%) of cases [6]. Involvement of warmer body areas like scalp, palms, soles, genitalia is mostly not seen. However, these are affected in MB cases as observed on prepuce in Badge *et al.* [10].

Although Telangana had a prevalence of <1/10,000 population as per NLEP annual report 2015-16, this study reports high number of cases 1183 presenting to a tertiary health care centre in five years of duration (March 2015 to April 2020). Youngest age reported was 6 years as in Patel *et al.* [11], but in contrast to 5 years as per Mushtaq *et al.* [12], 4 years as per Thyvalappil *et al.* [13], 2 years old as per Sushruth *et al.* [14]. However, total number of childhood cases were less (3.12%) when compared with other states (5.6-9.3%) (Table 7). Maximum number of patients were aged 21-30 years (32.2%) like Patel *et al.* [11] (60.3%), Thyvalappil *et al.* [13] (48.87%), Chhabra *et al.* [15] (49.3%).

Males exceeded females (69.9%) like Mushtaq *et al.* [12] (77.4%), Gupta *et al.* [16] (63.79%), Thyvalappil *et al.* [13] (70.68%). BI was negative in 610 cases (51.56%) in contrast to 74.43% in Thyvalappil *et al.* [13]. BT was the most common presentation 440 (37.19%) like (27.1%) in Patel *et al.* [11], (34.3%) in Mushtaq *et al.* [12], (60.15%)

in Thyvalappil *et al.* [13], (56.3%) in Chhabra *et al.* [15], (29.31%) in Gupta *et al.* [16].

Multibacillary cases were high in this study (96.1%) when compared to studies done in other states of India like Maharashtra, Jammu and Kashmir, Gujarat, Uttar Pradesh, Bihar, Kerala, Karnataka, Delhi and Himachal Pradesh ranging from 57-91%. It shows that the transmission is high in the community. Dermatologists and other health personnel often tend to miss the family members, neighbours, or close contacts in practice. This could further reduce the transmission.

However, number of cases presenting with reactions were less (5.7%) where other studies ranged between (10.1-37.5%) (Table 7). Type 1 reaction or reversal reactions 18 (1.52%) were predominantly seen in BT type 14/18 cases (77.7%). Type 2 reaction or ENL was seen in 42 cases (3.55%). Most common spectrum was LL leprosy 30 cases (71.4%) as in Patel *et al.* [11]. Infections, stress, MDT were a few common causes for the reaction.

Kamra *et al.* observed increased infiltration of mast cells in MB cases linking them to both reactional and nonreactional lesions [17]. Proper counselling about the reactions helped patients understand the reaction process and continue the therapy.

Various types of deformities were seen in a total of 84 cases (7.1%) which was less in comparison with studies from Jammu and Kashmir, Gujarat, Bihar, Kerala, Karnataka, Delhi, and Himachal Pradesh but was slightly higher than those in Maharashtra and Uttar Pradesh. Delay in the diagnosis due to social trauma, ignorance of patients, cost issues,

unavailability of medical facilities in rural areas and treatment irregularity were some of the causes for deformities. Proportion of grade 2 deformity was also less when compared to Rehlan *et al.*, [18] (19.03%). Most common was claw hand 38 cases (45.2%) which was comparable with (23.3%) in Chhabra *et al.* [15].

Most common clinical spectrum in childhood leprosy was BT in majority of cases in contrast to TT in Patel *et al.* [11] and Babu *et al.* [19]. Leprosy in children is an area of concern representing active dissemination of infection in the given community.

While focusing on yearly trends in various aspects among paediatric cases, it was observed that highest number of cases were reported in the year 2016/17, 10/37 (27.02%). There was increase in the proportion of female cases like that observed by Tiwari *et al.* [20], highest being in 2019/20, 6/9 (66.6%). Number of MB cases were showing variations with two peaks, one in 2016-17, 8/33 (24.2%) and the other in 2019-20, 9/33, (27.2%). Clinical pattern of leprosy was inclined towards TT and BT in all five years.

Among adults, the total number of cases were increasing gradually being maximum in 2019-20, 340/1183 (28.7%). Although majority of the cases were males, there was a gradual increase in the number of female cases ranging from 60 in 2015-16 to 100 in 2019-20. This increase could be due to increasing awareness about the disease among the family members towards leprosy. But this increase in female proportion of cases puts the children at home under a greater risk. Like the childhood cases, BT was the commonest presentation in all five years ranging from 65 in 2015-16 to 112 in

2019-20. Increase in number of MB cases and LL cases is an important area to be looked for, being highest in 2019-20. This rising trend was comparable with a five-year study done by Rathod *et al.* [21] as the proportion of MB cases showed a rising trend from 2011 onwards to 2014. Some of the reasons for the continued reporting of new cases mentioned were migration, patients first reporting to private health sectors or duplication of cases. Although migration of patients was found to be an important factor according to Dambalkar *et al.* [22], this was not a major factor in this study as migrants constituted very few cases 20/1183 (1.69%). Different studies on clinical trends were done in various states of India. With this study, we aimed to put forward the clinical trends from a tertiary care centre at Telangana.

Conclusion

Although prevalence of leprosy in this state is said to be <1 per 10,000 cases, we could detect many new cases every year in this tertiary care centre. The number of MB and childhood leprosy cases are rising. This raises an area of concern. However, there were a smaller number of patients who presented with deformities when compared to other states ($p=0.0001$). In spite of good efforts by the health care workers and other people involved in health care programmes at all levels, the burden of leprosy remains in the community. Being dermatologists, our efforts should strive towards early diagnosis and awareness among patients about their disease course, contagious nature, importance of examining the contacts, adherence to long term treatment and the effects which are left behind even after complete treatment. We must

also ensure reporting cases to the government leprosy centres as this, if not done, may affect the official national statistics.

Acknowledgements

Authors express acknowledgement to S. Narender,

Lab Technician and Dr. N. Balakrishna, HOD, Department of Statistics, AHERF, Former Scientist-E (Dy. Director), National Institute of Nutrition Hyderabad, Telangana.

References

- Anand V, Kunte R, Jathar S, Patrikar S. Evaluation of national leprosy eradication programme in Pune city of Maharashtra from 2008 to 2019 – A record based study. *Indian J Lepr* 2020;92:211-219.
- Joshi PL. Epidemiology of Leprosy. In: Bhushan K, K Hemantkumar (2nd). IAL Textbook of Leprosy. Jaypee, New Delhi 2016:34.
- Rao PN, Sujai S. Current situation of leprosy in India and its future implications. *Indian Dermatol Online J* 2018; 9(2):83-89.
- Sengupta U. Elimination of leprosy in India: An analysis. *Indian J Dermatol Venereol Leprol* 2018; 84(2):131-136.
- Smith CS, Aerts A, Kita E, Virmond M. Time to define leprosy elimination as zero leprosy transmission? *Lancet Infect Dis* 2016; 16(4):398-399.
- NLEP Annual Report 2015-2016. Central Leprosy Division, Directorate General of Health Services, Ministry of Health and Family Welfare Government of India, Nirman Bhavan, New Delhi.
- White C. 'Zero leprosy' and other endgame strategies: Rhetoric vs realism in public health campaigns. *Glob Public Health* 2020; 15(7):956-967.
- Sengupta U. Recent laboratory advances in diagnostics and monitoring response to treatment in leprosy. *Indian Dermatol Online J* 2019; 10(2):106-114.
- Weekly epidemiological record, 30 August 2019, vol. 94;35/36:389-412 [Google Scholar] https://www.who.int/wer/2019/wer9435_36/en/
- Badge SA, Gosavi AV, Ramteerthkar NA, Sulhyan KR. Lepromatous leprosy of prepuce - A case report. *J Krishna Inst Med Sci Univ* 2013;2(1):117-119.
- Patel KK, Momin AM, Mistry AA, Vaishnani JB. Study of clinico-epidemiological profile of leprosy patients at tertiary care centre of South Gujarat region. *Int J Res Dermatol* 2020; 6(3):355-360.
- Mushtaq S, Dogra N, Dogra D, Faizi N. Trends and patterns of leprosy over a decade in a tertiary care hospital in Northern India: A retrospective analysis. *Indian J Dermatol Venereol Leprol* 2020;86(2):141-149.
- Thyvalappil A, Pretty M, Anumod B, Ajaykumar S, Rajiv S, Joy B, et al. Current trends of leprosy in a tertiary care centre in North Kerala: A 10 year observational retrospective study. *Indian J Lepr* 2019; 91:175-183.
- Kamoji SG, Dastikop SV, Naveenkumar. Trends of leprosy in pre and post elimination era - A statistical and clinical update. *Indian J Clin Exper Dermatol* 2018; 4(1):26-29.
- Chhabra N, Grover C, Singal A, Bhattacharya SN, Kaur R. Leprosy scenario at a tertiary level hospital in Delhi: A 5-year retrospective study. *Indian J Dermatol* 2015;60(1):55-59.
- 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.
- Kamra HT, Munde SL, Nitin Gangane, S. M. Sharma et al. Significance of mast cell density and distribution in various histopathological lesions of leprosy. *J Krishna Inst Med Sci Univ* 2014; 3(1):57-63.
- Rehlan V, Ghunawat S, Tenani A, Mittal S, Garget VK. Trends in profile of leprosy cases reporting to a tertiary care centre in Delhi during 2006-2015. *Indian J Lepr* 2016;88:217-225.
- Babu A, Bhat MR, Jayaraman J. Childhood leprosy in the post elimination era: A vision achieved or a concern growing at large. *Indian J Paediatr Dermatol* 2018; 19(1): 26-30.
- Tiwari PK, Kar HK, Sharma PK, Gautam RK, Arora TC, Naik H et al. Epidemiological trends of leprosy in an urban leprosy centre of Delhi: a retrospective study of 16 years. *Indian J Lepr* 2011; 83(4):201-218.

-
21. Rathod SP, Mistry AS. Current scenario and challenges of urban leprosy in a tertiary care regional centre in Western India - A 5 year observational retrospective study. *Indian J Lepr* 2017; 89:1-7.
 22. Dambalkar K, Vashisht RP, Ramesh V. Problems due to migration of leprosy patients into urban areas. *Lep Rev* 1995; 66(4):326-328.
 23. Arif T, Amin SS, Adil M, Dorjay K, Raj D. Leprosy in the post-elimination era: A clinico-epidemiological study from a northern Indian tertiary care hospital. *Acta Dermatovenerol Alp Pannonica Adriat* 2019; 28(1):7-10.
 24. 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(4):173-179.
-

***Author for Correspondence:**

Dr Prasad Naik NM, Plot no 31, KGR Colony,
Badangpet, Hyderabad-500058, Telengana
Email: pras2win@gmail.com Cell: 9703544807

How to cite this article:

Gujarati RV, Naik PNM, Kunti S, Sudheer N,
Dungarwal Y. Leprosy, still a burden! A retrospective
study in a tertiary health care centre over recent 5 years.
JKrishna Inst Med Sci Univ 2023; 12(1):68-77

■ Submitted: 30-Sep-2022 Accepted: 16-Dec-2022 Published: 01-Jan-2023 ■
