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Original Research Article

Clinico-epidemiological study among leprosy patients at Leprosy Referal Center Buldana: a retrospective study

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ABSTRACT

Background: Leprosy has been officially eliminated from India since December, 2005; still, there are districts and blocks reporting high prevalence indicating ongoing transmission. The present study aimed at determining the current clinical profile of leprosy from a tertiary level hospital Leprosy Referral Centre (LRC) Buldana, Khamgao, Malkapur.
Methods: A retrospective, cross-sectional study was carried out on patients diagnosed and registered in the leprosy clinic of 3 LRC of Buldana district from 18 April to 31 December 2022. Data regarding demographic details, clinical features, treatment started and complications was analysed.
Results: A total of 904 patients were registered over distribution of three LRC a 6-year period, with M: F ratio of 1.3:1. 3.33% were children (≤14 years). Multibacillary leprosy was the most common clinical type (62.6%). Borderline tuberculoid leprosy was the most frequent morphologic type, seen in 44.6% followed by tuberculoid 25.33%, borderline-borderline (3.33%), borderline lepromatous (11.33%), lepromatous leprosy (8.66%), pure neuritic (2.00%), histoid and indeterminate leprosy (2.66%). 10.06 % patients presented in reaction. World Health Organization (WHO) grade II deformities were diagnosed in 0.66% with claw hand being the most common paralytic deformity.
Conclusions: Our study offers insight into the current status of the disease in an area of otherwise low prevalence. It is seen that multibacillary disease, leprosy reactions and deformities are commonly seen. Buldana has unique demography with a high degree of migrant workers, presenting to our centre (near border location) could be a possible contributing factor towards these aberrations. It highlights the need for continuation of targeted leprosy control activities and Surveillance active case detection.

Keywords: Leprosy, Grade 2 deformity, Leprosy reactions, Multibacillary disease

INTRODUCTION

Leprosy is caused by *Mycobacterium leprae*, a slow growing mycobacterium, manifesting as damage to the skin and peripheral nerves, skin, eyes, and lining of the nose (nasal mucosa).[1] The maximum incubation period reported is as long as 30 years. However, average incubation period is 5–7 years.[1]

There are several ways of classification of leprosy but most widely accepted is Ridley and Jopling classification. It has proved to be widely comprehensible and is known to give a good clinical-histological correlation, as well as to have the advantage of objectivity.[3] According to this system based on immunological, histological and microbiological parameters, leprosy patients have been grouped as: tuberculoid (TT), borderline tuberculoid (BT), borderline borderline (BB), borderline lepromatous (BL) and lepromatous (LL).

The World Health Organization (WHO), recommends categorization into paucibacillary (PB) and multibacillary (MB) based on skin lesions and/or nerve trunk involvement. There is wide variation in the clinical presentation of leprosy.[1]

Clinical diagnosis in some cases can be difficult which can lead to occurrence of resistant cases if treated inadequately. Skin biopsies play an important role in diagnosing and classifying different types of leprosy.

Leprosy was once feared as a highly contagious and devastating disease, but now we know it doesn't spread easily and treatment is very effective. However, if left untreated, the nerve damage can result in crippling of hands and feet, paralysis, and blindness. Globally, the registered prevalence of leprosy (number of cases on treatment at the end of 2021) was 133 802, and the prevalence rate was 16.9 per million population. The number of registered cases at the end of the year was 20 960 (prevalence rate 18.0) in AFR, 25 053 (24.3), in AMR, 4206 (5.5) in EMR, 81 222 (39.4) in SEAR and 2360 (1.2) in WPR.[3]

In India, the National Leprosy Eradication Programme (NLEP) is the centrally sponsored health scheme of the Ministry of Health and Family Welfare, Government of India. While the NLEP strategies and plans are formulated centrally, the programme is implemented by states and union territories (UTs). Prevalence rate of 57.8/10,000 in 1983, India has succeeded with the implementation of MDT in bringing the national prevalence down to "elimination as a public health problem" of less than 1/10,000 in December 2005 and even further down to 0.66/10,000 in 2016. By the end of March 2016, 551 districts (82.36%), out of the total 669 in districts, in India had a prevalence of <1/10,000 population which is the target of elimination as a public health problem.

India has achieved great success in eliminating the disease (prevalence rate being 0.68/10,000 in March, 2018); however, even in states/UTs that have achieved elimination, a few districts and blocks continue to have a prevalence >1/10,000.

Similarly, the Buldana district achieved elimination 0.5/10000 in 2008-09 and current 2021-22 prevalence rate 0.58/10000 population; yet, there are high endemic zones in Buldana block and Khamgao block.

Aim and objectives

Aim and objectives were to assess the current situation of leprosy and to address the possible loopholes in the running program, data from referral clinics is an essential pre-requisite. Hence, the present study was performed to analyze the profile and magnitude of leprosy patients presenting to leprosy referral center Buldhana district.

METHODS

A retrospective data analysis of all leprosy cases registered at the Leprosy Referral Center (LRC) of Buldana District from April 2017 till October 2022, was carried out. Our LRC is situated in hospital building GH Buldana, GH Khamgao and SDH Malkapur. Covering population of Buldana city, near block Shegao Sangrampur, Jalgao Jamod, Motala, Chikhali and Malkapur as well as nearby districts like Akola, Jalgao, and Washim. Case detection was based on voluntary reporting and patient referred from districts. The data was analyzed according to age, sex, residence, history of contact, type of leprosy, leprosy reactions, and deformities. Patients were classified as per Ridley Jopling classification, and as per the criteria laid down under NLEP and treated accordingly. As per WHO classification, the disease was classified as multibacillary (MB) if there are six or more lesions and/or more than one nerve involvement. Our data was compared with the national averages.

RESULTS

A total of 904 patients were registered over a 6-year period, with M: F ratio of 1.3:1. 3.33% were children (≤14 years). Multibacillary leprosy was the most common clinical type (62.6%). Borderline tuberculoid leprosy was the most frequent morphologic type, seen in 44.6% followed by tuberculoid 25.33%, borderline-borderline (3.33%), borderline lepromatous (11.33%), lepromatous leprosy (8.66%), pure neritic (2.00%), histoid and indeterminate leprosy (2.66%). 10.06% patients presented in reaction. WHO grade II deformities were diagnosed in 0.66% with claw hand being the most common paralytic deformity.

In this study highest number of cases seen in 21-30 age group 19.5% followed by 18.4% 41-50 age group and lowest seen in 81-90 age group 0.3%. and the minimum age having leprosy case is 6 year and maximum age is 85 years and mean age is 40.06 and SD=16.57 (Table 1).

Table 1: Age-wise distribution of cases.

S. no.	Age interval (years)	Observe frequency	Percentage (%) (n=904)
1	0-10	7	0.8
2	11-20	122	13.5
3	21-30	176	19.5
4	31-40	128	14.2
5	41-50	166	18.4
6	51-60	148	16.4
7	61-70	135	14.9
8	71-80	19	2.1
9	81-90	3	0.3
	Total	904	100

From Figure 1, it is observed that MB cases are higher 62.61% 566/904 and 37.38% 338/904 PB cases. i.e. infectious case are more than non-infectious cases which significantly implies that there is late diagnosis of cases (Figure 1).

Table 2 shows that child cases are only 30 in number i.e. 3.3% of total 904 cases while patient having lepra reaction (type 1 and 2) are about 10% and patients with visible deformity and having loss of anesthesia over palm and sole

are only 6 cases which is less negligible 0.66% and 43 cases i.e. 4.76% respectively.

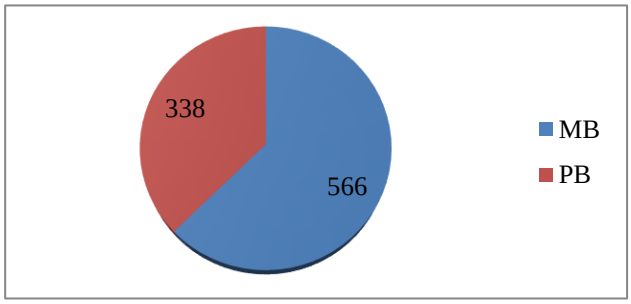

Figure 1: Cases distribution as per WHO classification.

Table 2: Showing child cases, deformity and lepra reaction cases.

Type	Child cases	Gr1 defor-mity	Gr2 defor-mity	Lepra reaction
Number	30	43	6	91
Percentage	3.3	4.76	0.66	10.06

Out of 904 male cases 509 (56.30%) and female 391 (43.25%) i.e. M: F: 1.33:1 (Figure 2).

From Table 3, it was observed that borderline tuberculoid leprosy was the most frequent morphologic type, seen in 44.6% followed by tuberculoid 25.33%, borderline-borderline (3.33%), borderline lepromatous (11.33%), lepromatous leprosy (8.66%), pure neuritic (2.00%), histoid and indeterminate leprosy (2.66%). Out of 904 cases there are 338 cases are non-infectious and 566 are infectious of which 150 cases referred for smear examination (N=150).

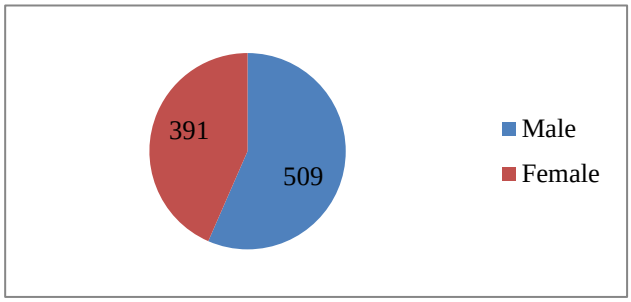

Figure 2: Gender wise case distribution.

Figure 3 shows that number of cases detected from 2017-18 to 2022-23 were declining and case detection were more among male than female 105 versus 88 in year 2017-18 to 72 versus 58 in year 2022-23.

The highest number of new cases was detected in 2017-2018, with a notable decline in 2020-2021, likely due to the COVID-19 pandemic affecting healthcare services. A resurgence in case detection was observed in the subsequent years (Figure 4).

Table 3: Case profile of patients.

Type	Number	Percentage (n=150)
TT	38	25.33
BT	70	46.66
BB	5	3.33
BL	17	11.33
LL	13	8.66
PN	3	2.00
Histoid	4	2.66
Total	150	100

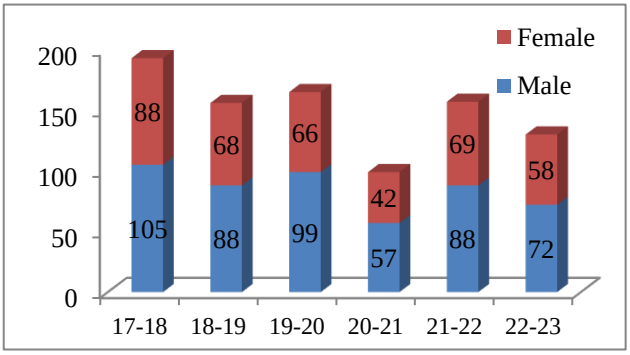

Figure 3: Year-wise cases according to gender.

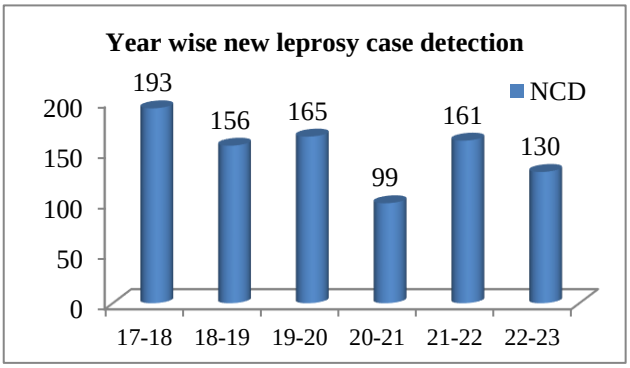

Figure 4: Year wise new case detection.

In 2017-2018 (193 cases), the highest number of new cases was recorded, indicating a potentially high burden of leprosy or improved case detection methods at the start of the period while for the 2018-2019 (156 cases), a notable decrease in new cases, which might reflect the impact of ongoing public health efforts or variations in case reporting. In 2019-2020 (165 cases), a slight increase compared to the previous year suggests variability in case detection, possibly due to changes in surveillance intensity or public health outreach programs, while in 2020-2021 (99 cases), the significant drop in new case detection coincides with the COVID-19 pandemic, which likely disrupted health services, reduced public health outreach, and limited patients' access to healthcare facilities. In 2021-2022 (161 cases), a rebound in new cases suggests a

recovery of health services and resumption of active case finding and surveillance activities post-pandemic, while in 2022-2023 (130 cases), a slight decline from the previous year indicates stabilization in case detection, reflecting a return to routine healthcare operations and potentially improved control measures.

DISCUSSION

The present study was performed to analyse the profile and magnitude of leprosy patients presenting to leprosy referral centre Buldana district from 01 April 2018 to 31 December 2022. And finding of our study was out total of 904 patients were registered over a 6-year period, with M: F ratio of 1.3:1. 3.33% were children (≤14 years). Multibacillary leprosy was the most common clinical type (62.6%). Borderline tuberculoid leprosy was the most frequent morphologic type, seen in 44.6% followed by tuberculoid 25.33%, borderline-borderline (3.33%), borderline lepromatous (11.33%), lepromatous leprosy (8.66%), pure neritic (2.00%), histoid and indeterminate leprosy (2.66%). 10.06% patients presented in reaction. WHO grade II deformities were diagnosed in 0.66% with claw hand being the most common paralytic deformity.

The findings from our study are consistent with several other studies conducted on the clinic-social profile of leprosy cases. In a study conducted at a leprosy referral center in Wardha, Maharashtra, India, the male to female ratio was reported as 1.4:1, which is similar to our finding of 1.3:1. The prevalence of multibacillary leprosy was also high in this study, accounting for 60.3% of the cases, closely aligning with our finding of 62.6%.

A study by Rao et al in Andhra Pradesh reported that 65% of the patients had multibacillary leprosy, and the most common clinical presentation was borderline tuberculoid, observed in 47% of the cases, which is consistent with our observation of 44.6%. Similarly, another study in Tamil Nadu found that multibacillary cases constituted 63.5% of their patient population, with borderline tuberculoid being the predominant morphologic type at 46%.[19]

However, there are studies with differing findings. A study conducted in the state of Gujarat found a lower prevalence of multibacillary leprosy at 55%, and the most common type was tuberculoid leprosy at 33%, contrasting with our findings where tuberculoid leprosy accounted for 25.33%.[20] Additionally, a study in Uttar Pradesh reported a higher prevalence of lepromatous leprosy at 15%, compared to our finding of 8.66%.[21]

In terms of deformities, our study observed WHO grade II deformities in 0.66% of the patients, with claw hand being the most common paralytic deformity. This is lower compared to a study in Karnataka, where grade II deformities were seen in 1.5% of the patients.[22] The lower prevalence of deformities in our study could be attributed to early diagnosis and effective management of the disease.

Our study reported that 3.33% of the cases were children (≤14 years), which is slightly lower than the 4.5% reported in a study conducted in West Bengal.[23] This could be due to differences in the demographic and health infrastructure between the regions.

CONCLUSION

Our study offers insight into the current status of the disease in an area of otherwise low prevalence. It is seen that multibacillary disease, leprosy reactions and deformities are commonly seen.

Buldana unique demography with a high degree of migrant workers, presenting to our center (near border location) could be a possible contributing factor towards these aberrations. It highlights the need for continuation of targeted leprosy control activities and Surveillance active case detection.

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