Original Research Paper
Leprosy scenario at a tertiary care hospital in North India: A 5-year retrospective study

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Abstract:
Leprosy has been officially eliminated from India since December, 2005; still wide variations in prevalence rates continue to exist across the states and regions in the country.
Aims:
To determine the current clinical profile of leprosy at a tertiary care hospital in North India.
Materials and Methods:
A five year retrospective study was carried out on patients diagnosed and registered in the leprosy clinic of a tertiary care teaching hospital in North India from January 2013 to December 2017. Data regarding demographic details, clinical features, treatment started and complications was analyzed.
Results:
A total of 128 patients were registered over a 5-year period, with M: F ratio of 2.7:1. Of the total 2.34% were children (=14 years) and 89.4 % patients were immigrants from adjoining states. Multibacillary leprosy was the most common clinical type (85.15%). Borderline tuberculoid (69.53%) leprosy was the most frequent morphologic type followed by tuberculoid (10.16%), borderline lepromatous (8.59%), pure neuritic (7.03%) and lepromatous leprosy (2.34%). No case of histoid and indeterminate leprosy was reported. 18.75% patients presented in reaction (Type I in 16.4% and Type II in 2.34%). WHO grade II deformities (G2D) were diagnosed in 2.34% with claw hand being the most common paralytic deformity (1.56%).
Conclusion:
Despite statistical elimination, multibacillary disease and leprosy reactions are commonly seen as presenting manifestations, in contrast to national projected trends. It highlights the need for high quality leprosy services including good referral system for active case detection.

Introduction

Leprosy is caused by *Mycobacterium leprae*, a slow growing mycobacterium, manifesting as damage to the skin and peripheral nerves. India has achieved great success in eliminating the disease (prevalence rate being 0.66/10,000 in Sept, 2017); however, even in states/UTs that have achieved elimination, a few districts and blocks continue to have a prevalence >1/10,000. To assess the current situation of leprosy and to overcome the possible loopholes in the running program, data from referral clinics is an essential pre-requisite. The aim of study was to analyze the profile and magnitude of leprosy patients presenting to our tertiary care referral centre.

Materials And Methods

A retrospective data analysis of all leprosy cases registered at the Leprosy clinic of dermatology department of Government Medical College, Patiala from January 2013 till December 2017, was carried out. Our hospital is situated in North India and caters to the population of Punjab and adjacent states, especially Uttar Pradesh, Bihar, Haryana, Himachal, and even Nepal. Case detection was based on voluntary reporting and referral from lower centers.

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 (RJ) classification[1] and as per the criteria laid down under NLEP (National Leprosy Eradication Programme) and treated accordingly. As per WHO classification[2] the disease was classified as multibacillary (MB) if there are six or more lesions and/or more than one nerve involvement and paucibacillary (PB) if lesions are less than six in number and/or if only one or no nerve involvement.

Results

A total of 128 new cases of leprosy were registered during the study period of 5 years. The year-wise distribution of leprosy patients is shown in Table 1. There was a male preponderance with M: F ratio of 2.7:1. A

majority of the patients (44.53%) were in the middle age group (31-50 years) Table2. Only 3 (2.34%) of these patients were children. The majority of patients were immigrants (97.65%, *n* = 125), mainly from Uttar Pradesh (56.25%, *n* = 72) and Bihar (31.25%, *n* = 40). The regional distribution of patients has been depicted in Table 3. Only 2 patients (1.56%) gave a history of contact with a leprosy patient within the household.

Table 1: Year wise distribution of newly registered leprosy patients

Year	Total no. of patients (n)	M n(%)	F n(%)	MB n(%)	PB n(%)	Type 1 reaction n(%)	Type 2 reaction n(%)	G2D n(%)
2013	30	21(70.00)	9(30.00)	19(63.38)	11(36.67)	5(16.67)	1(3.33)	2(6.67)
2014	32	20(62.50)	12(37.50)	28(87.50)	4(12.50)	6(18.75)	0(0.00)	1(3.13)
2015	22	18(81.82)	4(18.18)	20(90.91)	2(9.09)	3(13.64)	0(0.00)	0(0.00)
2016	26	21(80.77)	5(19.23)	24(92.31)	2(7.69)	4(15.38)	2(7.69)	0(0.00)
2017	18	14(77.78)	4(22.22)	18(100.0)	0(0.00)	3(16.67)	0(0.00)	0(0.00)

Table 2: Age wise distribution of newly registered leprosy patients

Year	Upto 14 yrs n(%)	15-30 yrs n(%)	31-50 yrs n(%)	>50yrs n(%)
2013	2(6.67)	12(40.00)	13(43.33)	3(10.00)
2014	1(3.12)	9(28.12)	16(50.00)	6(18.75)
2015	0(0.00)	9(40.90)	8(36.36)	5(22.73)
2016	0(0.00)	14(53.85)	11(42.35)	1(3.85)
2017	0(0.00)	8(44.44)	9(50.00)	1(5.55)
Total	3(2.34)	52(40.62)	57(44.53)	16(12.50)

Table 3: Demographic profile of the patients included in the present study

State	n(%)
Uttar Pradesh	72(56.25)
Bihar	40(31.25)
Haryana	4(3.12)
Nepal	6(4.69)
Punjab	3(2.34)
Jharkhand	1(0.78)
Madhya Pradesh	1(0.78)
Tamil Nadu	1(0.78)

MB leprosy was the most common clinical type of leprosy encountered in 85.15% patients (*n* = 109). According to the RJ classification, 85.16% (*n* = 103) patients were in the borderline spectrum. Borderline Tuberculoid (BT) was the most frequent morphologic type, seen in 69.53% (*n* = 89) followed by Tuberculoid (TT) in 10.16% (*n* = 13), Borderline Lepromatous (BL) in 8.59% (*n* = 11), and Lepromatous (LL) in 2.34% (*n* = 3) patients. Additionally, special types of leprosy –Pure Neuritic Leprosy was recorded in 7.03% (*n* = 9) patients Table 4.

Table 4: Ridley Jopling and special types of cases:

Year	TT n(%)	BT n(%)	BB n(%)	BL n(%)	LL n(%)	Pure neuritic n(%)
2013	6(20.00)	19(63.33)	0(0.00)	3(10.00)	0(0.00)	2(66.70)
2014	3(9.37)	25(78.12)	0(0.00)	2(6.25)	0(0.00)	2(6.25)
2015	2(9.09)	14(63.64)	0(0.00)	2(9.09)	1(4.54)	3(13.64)
2016	2(7.69)	17(65.38)	1(3.84)	2(7.69)	2(7.69)	2(7.69)
2017	0(0.00)	14(77.78)	2(11.11)	2(11.11)	0(0.00)	0(0.00)
Total	13	89	3	11	3	9

Clinically thickened peripheral nerve enlargement was recorded in 84.37% (*n* =108) patients. The ulnar nerve was the most commonly thickened nerve seen in 75% followed by common peroneal nerves in 61%.

Biopsy records were available for all cases. BT leprosy was the most common histological diagnosis. At initial presentation to the leprosy clinic, 18.75% of the patients were seen to be in reaction. Type I reaction (T1R) was present in 16.41% (*n* = 21) and Type II reaction (T2R) in 2.34% (*n* = 3) patients. . 68% of the T1R cases was observed among BT patients, while all of the T2R were seen in lepromatous patients (BL and LL patients). The percentage of leprosy reactions during the study period has been shown in Table 1.

The overall incidence of various deformities of the hands, feet, or eyes (WHO deformity Grade II) was 2.34% (*n* = 3) detected at the time of diagnosis. Claw hand was the paralytic deformity seen in 1.56% (*n* = 2), followed by trophic ulcers in 0.78% (*n* = 1).

Discussion

The important epidemiological indicators were compared with the corresponding NLEP (India) values and Punjab state values. The comparison has been shown in Table 5.

Table 5: Comparison of present study with global ,national and Punjab state trends

Indicators(% of new cases detected)	Present Study	Global values 2017	NLEP(India) 2017	Punjab State values(2017)
Childhood leprosy	2.34%	8.49%	8.80%	17.25%
Female cases	26.56%	39.20%	37.7%	25.72%
MB cases	85.15%	59.13%	60.6%	79.55%
G2D	2.34%	5.97%	3.94%	0.00%

After reduction of prevalence rate (PR) of leprosy to <1 per 10,000 population, in April 2016 WHO launched a 5- year global leprosy strategy which set 3 main targets at global level to be achieved by 2020: i) a reduction to zero cases of G2D child cases; ii) reduction in rate of new G2D cases to < 1 case per million population; and iii) zero countries with laws that allow discrimination against leprosy. In India there is no discrimination on grounds of leprosy but we are still to achieve zero child with G2D and G2D cases <1 per million population[3].To achieve this early diagnosis and prompt treatment of all new cases of leprosy with multidrug therapy (MDT) remain the key strategies for leprosy control in India. In spite of the established fact that leprosy is least infectious disease and completely curable, the social stigma still remains a main obstacle in self reporting and early treatment. Early detection depends entirely on voluntary reporting which implies awareness of disease and treatment facilities. Our data from a tertiary care referral centre shows that an early active search for cases may be needed. MDT has brought down the PR of disease in India from 25.1 in 1991 to 0.66 per 10,000 population in March 2017. Punjab is a low endemic state in terms of prevalence, and PR is 0.19 per 10,000 populations which is far below national PR.

It is seen that though number of cases has decreased but disease burden is far more as reported by Singhal et el[4] and Prasad et al[5]. The number of new cases detected as reported by 121 countries during 2017 is 2,14,783 among which India contributed 63% (1,35,485 cases).In Punjab total of 626 cases were recorded in 2017. Leprosy cases are not uniformly distributed in our country but tend to cluster in certain areas.

In this study, the total number of new cases was 128. Majority of the patients belonged to the middle age group (31-50 years), in contrast to the finding reported by Ardeshna KP et al[3] and Jindal et al[6] where maximum patients were in age group of (15-30 years). The percentage of childhood leprosy was 2.34% which is lower than that reported by Tiwary et al[7] and Grover et al[8] (7.06%). It is lower than national value of 8.7%and global value of 8.49%. This data indicates that leprosy continues to be transmitted in the community but it is less in Punjab as compared to national and global trends.

The higher male to female ratio (2.3:1) in our series is because mostly male labourers migrate to Punjab in search of employment for earning livelihood. Such demographic effects on disease prevalence have been reported by other authors as well[9,10].

A 5.9% rate of household contact in our series is lower than that reported by Jindal et al[6] (9.2%) Further, the risk is higher if contact has the MB form of the disease. Thus, it is important to take detailed contact history and screen family members whenever possible.

The percentage of MB cases (85.15.%) in our study was significantly higher than national value of 49.57% and global value of 59.13%.The   percentage of cases from Punjab state was 79.55% The high proportion of MB cases in our study could be a sign of existence of inaccessible pockets of migratory population harboring undiagnosed leprosy for a long time.

The most frequent morphologic type in our study was BT (56.3%), which is similar to the observations made by Tiwary et al[7] (56.9%), Mahajan et al[11] and Singh et al[12].

A higher rate (78.8%) of clinico-histopathological concordance was found in our patients as compared to 52% reported by Sehgal et al.[13] and 60.6% by Kumar et al[14]. As proposed by Nadkarni et al[15], a proper selection of optimum lesion for biopsy might have been responsible for the high rate observed in our series.

The rate of reactions observed in our series was 18.75%. About 16.4% of patients presented with T1R, which was lower than reported by Kumar et al[14] (30.9%). Most of other epidemiological studies showed a lower percentage of T1R[6,12]. Most of T1R was seen in BT leprosy (65.9%) which was a consistent finding present in other studies[12,16]. T2R was seen in 2.34% patients, which is lower as compared to that reported by Jindal et al[6] (17.2%). Reactions in leprosy indicate that the patients present to health care facilities when much damage has already occurred. If detected early by trained health care workers, we could hope to prevent this morbidity associated with the disease.

Our study showed a lower incidence of WHO grade 2 deformity at presentation (2.34%) as compared to national value of (3.87%)[12]. This could be due to low rate of occurrence of T1R in our series, which significantly decreases the risk of deformities. There is need to improve early detection of reactions as well as the role of careful neurological examination in patients with T1R to help further reduce deformities.

Conclusions

The experience from our tertiary care referral centre suggests that though great strides have been made in elimination of leprosy, we still cannot celebrate. The high rate of multibacillary disease or patients presenting with reactions is a cause for concern. Its time when we need to consolidate the achievement made and intensify on the aberrations discovered.

Conflict of Interest: None

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