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Original Article

A Clinico-epidemiological Retrospective Study of Hansen's Disease in a Tertiary Care Hospital of Northeast India

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Hansen's disease is a chronic granulomatous disease caused by *Mycobacterium leprae* with a strong immunological basis, and has an immunological background attached to it. MDT is a highly effective option available for treatment of the disease. Information about the profile of disease is of paramount importance for its proper management and finding gaps for further research. This is a retrospective study conducted in a tertiary care hospital of northeast India. Records of Hansen's disease patients from January 2011 to December 2020 were taken and analyzed retrospectively. A total of 146 cases whose complete records of treatment were available were included in the study. Leprosy was mainly distributed in the age group from 20-40 years (57.3%). Multibacillary patients were 124 (84.9%). The most common presentation of the study was plaque seen in 85% of the patients). Borderline lepromatous leprosy (27.03%) was the most common clinical and histopathological diagnosis. Clinical diagnosis of subtype of leprosy was reconfirmed by histology in 78% of the slides. 10 (6.8%) patients had claw hands, 15 (10.2%) had foot drop and 4(2.7%) had diminished vision. Type 1 reaction was the most common reaction seen in 20 patients of borderline tuberculoid and one patient of mid borderline leprosy and 12 patients had Type 2 reaction. 44/146 (30%) of these patients were migrants belonging to other states, this indicates problems in other states especially with regard to access to timely treatment and persisting foci in those areas. They need to be tackled by proper research cum intervention strategies.

Keywords: Leprosy, Deformity, MDT, Prevalence, North-east India

Introduction

Hansen's disease (HD) is one of the oldest known diseases of mankind. It is a chronic infectious disease with a long and variable incubation period caused by *Mycobacterium leprae*. Despite the fact, morbidities associated with the disease pose continuous challenges which include delay in the diagnosis and treatment, adequate response to therapy, problem of drug resistance and constant discrimination coupled with social stigma against people affected by leprosy (Rao & Suneetha 2018, Nath et al 2015). Owing to varied clinical presentations the clinical diagnosis of early cases with nascent lesions is often difficult. Here comes the role of histopathology of skin and nerve biopsy of suspected cases of HD for early diagnosis and treatment (Atram et al 2020). Post elimination of the disease also there has been a surge in the fresh cases as the variable incubation period ranging from few weeks to 30 years and cases remain "hidden" (Sengupta 2018)

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With the effective treatment of leprosy cases many goals have been laid down so far and successfully achieved in control of leprosy. The milestone achievement was global elimination of leprosy as public health problem (prevalence less than 1/10,000) in 2000 and from India in 2005. However, despite being eliminated as per WHO Global Leprosy Update 2020 there have been 202256 new cases of leprosy with 14893 childhood cases and 10816 cases of Grade 2 disability (WHO 2016). The aim of our study is to get an overview of the clinico- epidemiology of leprosy cases that are reporting to our tertiary care hospital located in Northeast of India. Such data may be relevant for planning future research cum intervention studies to deal with leprosy cases from this population at community and institutional levels.

Patients and Methods

This is a hospital based retrospective cross sectional study carried out on patients reporting to our tertiary care hospital during the period from 1st January 2011 to 31st December 2020.

Retrospective health registration records of all 146 leprosy patients in the age group from 5 years to 65 years who attended the OPD and IPD of our tertiary care hospital of Assam and were followed-up were analyzed. Broadly patients were classified according to Ridley-Jopling (1966)) and the Indian Association of Leprologists criteria (IAL 1982). Classification into paucibacillary and multibacillary groups was as per WHO criteria followed by our NLEP (NLEP Annual Report 2015-2016). Disabilities were graded as per WHO criteria (Brandsma & van Brakel 2003). The patients whose complete treatment records were available have been included in the study. The cases belonging to migrant population which were not available for regular monthly follow up were excluded from the study. A total of 15 drop out cases were identified from the population. All the cases were classified into paucibacillary (PB) and multibacillary (MB) types and were treated by standard regimens. The duration of treatment for PB was six months whereas it was 24 months for MB patients. Treatment was extended in cases having recurrence of reactions.

Data was recorded in Microsoft excel worksheet and analyzed in SPSS Software using descriptive statistics like mean, percentages and proportions.

Ethical clearance was taken from the institute ethical committee.

Results

Among these 146 leprosy patients the male to female ratio was 2.8:1. Multibacillary patients were 124 (84.9%). The youngest patient was of 5 years of age and oldest being 65 years. The most common presentation of the study was plaque seen in 124/146 (85%) of these patients. The clinical spectrum of the disease is described in Table 1. Borderline lepromatous leprosy was diagnosed in 32 (27.03%) which was the most common clinical and histopathological diagnosis. 4 (2.7%) cases were confirmed as histoid leprosy by histology. The ulnar nerve in 112 patients (76.7%) was the most commonly found thickened nerve followed by radial cutaneous nerve. Slit skin smear positivity for acid fast bacilli was 61 (42%). Most of the cases were confirmed by histopathological examination of skin and nerve biopsy specimen. Clinical diagnosis of subtype of leprosy was reconfirmed by histology in 78% cases. Rest of the 22% patients were diagnosed on clinical grounds based on the leprosy criteria as biopsy findings showed nonspecific changes.

The average BI of our cases was 3+. There were patients with recurrent reactions which required longer than usual treatment with MB-MDT to achieve bacillary negativity. As per the statistical analysis the average of these 146 patients is adding up to 36 months (Table 1).

Table 1 : Distribution of leprosy as per classification, mean initial BI, disabilities, reactions and mean duration of treatment completion (n=146).

Classification	No of cases	Initial BI (mean)	Deformity (n)	Reaction(n)		Mean duration of treatment completion in months
				Type 1	Type 2	
Pure neuritic	6(4.1%)	Nil	2	1	Nil	14
Tuberculoid	4(2.7%)	Nil	Nil	Nil	Nil	16
Borderline Tuberculoid	75(58.11)	+1	21	18	0	25
Mid-Borderline	6(4.1%)	+2	1	1	1	28
Borderline Lepromatous	32(27.03%)	+2	12	0	11	24
Lepromatous	19(10.6%)	+3	4	0	1	36
Histoid	4(2.7%)	+3	1	Nil	Nil	24
Indeterminate	Nil	Nil	Nil	Nil	Nil	Nil

Table 2 : Migrant patients from other northeastern states included in the study.

S No	Migrants from other northeastern states of India	Number of cases
1	Sikkim	13
2	Manipur	10
3	Meghalaya	6
4	Tripura	6
5	Nagaland	1
6	Arunachal Pradesh	8
7	Mizoram	Nil
	Total	Nil

Table 3 : Comparison of NLEP indicators at India and Assam levels with the present study

Leprosy indicators	India (NLEP 2019-20)	Assam (NLEP 2019-20)	Present study
Percentage of multibacillary cases males	54.28	83.76	84.9
Percentage of multibacillary cases females	39.21	30.35	28.4
Percentage of child cases	6.87	7.88	5.4

Regarding the disabilities, 10 (6.8%) patients had claw hands, 15 (10.2%) had foot drop and 4 (2.7%) had diminished vision._Reactions were noticed among a total of 32 patients-type 1 reaction was the most common, seen in 20 patients (26.6%) of borderline tuberculoid and one patient of mid

borderline leprosy and 12 patients (37.5%) had Type 2 reaction.

History of household and familial contact was present in 8.2%. The spectrum of leprosy among contacts was predominant of multibacillary type. House to house survey of close contacts was carried out by leprosy health worker as a method of contact tracing. This information was available from the retrospective records.

Discussion

Leprosy is known to be the oldest historic disease of humans. 1st International Congress of Berlin had declared it an incurable disease, but records from history with successful treatment of disease using chaulmoogra oil are evident. With the introduction of sulphones, the management of leprosy has taken a major leap. Consequently, with the use of MDT since 1982 and execution of leprosy programme the disease has been largely controlled in India. Leprosy is a disease of all age groups, and no class or strata of population are immune to it. Increased opportunities of contact with susceptible individuals and waxing waning immunity can lead to development of signs and symptoms of the disease. The greater number of multibacillary cases in the study indicates that there exists significant pocket(s) of infection in the community in this area which possibly remains hidden, undetected and undiagnosed by health services. This is likely to result in rapid transmission of infection and subsequent development of reaction and morbidities in form of deformities in the population (van Brakel & Kahwas 1996, Kumar et al 2004) In our retrospective study history of household and familial contact was present in 8.2% cases. Study conducted in India by Atram et al (2020) reported 5.8% positivity rate among close contacts which were found to be predominantly children. Such data may be partly due to sub-sub-optimal search and may also indicate many infectious cases in the community responsible for spread in the recent years. There could be other situations such as a study conducted in northern area of Teresina, Brazil 38.3% of patients gave history of contact with leprosy patient (Lustova et al 2011). India and Brazil account for the maximum burden of disease (Naghavi et al 2016). It will be appropriate not to extrapolate the data but rely on actual community-based studies to trace the sources and transmission for devising strategies for management at public health level.

Reactions in leprosy are a common phenomenon which influences the course of illness. Type 1 reactions were more common in our study, similar results were seen in study of Vashisht et al (2021). Borderline tuberculoid type was the most common form of leprosy seen in our study which was confirmed by findings of biopsy. Patients were treated with tapering doses of oral steroids along with MDT for Type1 reaction and oral thalidomide along with cap clofazimine and steroids for Type 2 reaction. From these records it was observed that out of 146 patients only 5 patients were placed on alternate regimes. The alternate regimens used were monthly and intermittent ROM due to non-tolerance of standard MDT. Non tolerance to drugs included drug reactions like dapsone hypersensitivity, elevated liver enzymes, photosensitivity, skin rashes and dyspigmentation. 3 patients developed dapsone hypersensitivity and drug reaction with rifampicin. 1 patient refused to continue MDT owing to pigmentary side effects of clofazimine. Clinical and histopathological resolution of preexisting lesions with no onset of fresh signs and symptoms of the disease was taken into consideration before stopping treatment for the patients. Patients with recurrent reactions and high bacillary index even after 2 years of treatment with MB-MDT were continued drugs till they achieved complete resolution of lesions and smear negativity. The mean duration of treatment was 36 months. There were 12 defaulters registered in the retrospective data

and 2 cases were classified as relapse patients who were restarted with the MDT regime. As standard practice in our hospital is different than NLEP, no comparison of treatment durations will be meaningful.

Till date no major study has been reported from the population of northeast India. The study mirrors the clinico-epidemiological profile of disease from states of Assam and migrant population from other eastern states of Sikkim, Nagaland, Manipur, Mizoram, Meghalaya and Arunachal Pradesh (Table 2). As per the NLEP 2019-2020 annual report, state of Assam has achieved the goal of elimination of leprosy with the Prevalence rate of less than 1 per 10,000 with only one district Sivasagar having PR more than 1 per 10,000. The various NLEP indicators of India and Assam for the year 2019-20 have been studied and tabulated in Table 3. This has been made possible by delivery of adequate and effective MDT, good coordination with the administration and integration of NLEP with NHM for funding the activities. In our study 13 cases of Hansen's disease were the residents of Sikkim, 10 from Manipur, 6 from Meghalaya and Tripura each, 1 from Nagaland and 8 from Arunachal Pradesh. However, 44/146 belonging to other states getting treatment at our center indicate problems in other states especially about access to timely treatment and persisting foci in those states and areas. They need to be tackled by proper research cum intervention strategies. These cases provide food for thought and sneak peek of the tip of iceberg in these areas as they remain hidden pockets of transmission of Hansen's disease. More multicentric population-based studies need to be carried out in future to study the trend of disease in these areas.

Comparison with key NLEP indicators about proportion of multibacillary cases and child rates indicates that our hospital data is not very different from NLEP data from Assam (Table 3). Actual field-based studies are required to understand the reasons for profile and endemicity, especially transmission dynamics of leprosy in Assam and other northeastern states.

Conclusion

Our study provides a glimpse of the leprosy situation in this area. However, community-based studies need to be carried out for active tracing of the disease and its transmission. The migrant population included in the study also provide an overview of the disease in the seven sister states. This needs to be further backed up with larger population-based studies to determine the disease activity in these areas.

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