



Original Research Article

A clinicoepidemiological study of familial leprosy

Shashikiran A R¹, Laxmi B Horatti², Dilip Kumar N R^{3,*}¹Dept. of Dermatology, iSkin Clinic, BTM Layout, Bengaluru, Karnataka, India²Dept. of Dermatology, Bowring and Lady Curzon Hospital, Bengaluru, Karnataka, India³Dept. of Dermatology, Akash Institute of Medical Sciences, Bengaluru, Karnataka, India

ARTICLE INFO

Article history:

Received 22-06-2021

Accepted 25-06-2021

Available online 04-09-2021

Keywords:

Leprosy

Familial leprosy

Childhood leprosy

Conjugal leprosy

ABSTRACT

Background: Hansen's disease (also known as leprosy) is an infection caused by *Mycobacterium leprae* which can affect the skin, mucous membranes and nerves. It is known to spread among and infect family members. There are very few published studies pertaining to family leprosy conducted in India and worldwide.

Aim: To find the prevalence of familial leprosy and to know the clinicoepidemiological patterns of these cases.

Settings and Design: Observational study.

Material and Methods: This was a descriptive study conducted for a period of five years from 2013-2018. The study population included all new documented cases of leprosy visiting our out-patient department during the study period. All the patients were diagnosed as leprosy on histopathological confirmation or by the presence of cardinal signs of leprosy according to the world health organization (WHO) definition. The data collected was analysed by simple descriptive statistics. Permission to conduct the study was taken from institutional ethical committee. Consent was taken from index case and family members.

Results: A total of 302 new leprosy cases with 18 index cases (n=18) whose family members were affected, accounting for the prevalence of 5.96 %. Total number of family members with documented leprosy (old or newly detected) was 26. So, the total number of leprosy cases were 44 (index cases + family members). Out of the 18 families, 4 families had more than one person who was affected. 8 cases (18.18%) of Childhood leprosy were noted. Among the index cases 4 cases (22%) of paucibacillary leprosy were seen and 14 cases (78%) of multibacillary leprosy was seen. Among the family members, 18 cases of paucibacillary leprosy were seen and 8 cases of multibacillary leprosy were seen. Conjugal leprosy was seen in 10 families accounting for the prevalence of 3.31%.

Conclusion: Our study intends to emphasize the importance of examining the close contacts of a case of leprosy, especially the family members in whom the incidence of leprosy could be very high. By way of identifying leprosy cases early in its course we may be able to prevent deformities to a great extent.

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1. Introduction

Hansen's disease (also known as leprosy) is an infection caused by *Mycobacterium leprae* which can affect the skin, mucous membranes and nerves. It is one of the oldest known

infective diseases, and was known to affect family members (Danielssen & Boeck 1848) even before the discovery of *Mycobacterium Leprae* by Hansen in 1874. Apart from droplet infections, Leprosy is also known to have genetic predisposition.^{1,2} The prevalence of Leprosy in India is very high, estimating half of world's cases to occur.³ According to a study, the prevalence of familial Leprosy in India was

* Corresponding author.

E-mail address: drdilip57@gmail.com (D. Kumar N R).

5.44%.⁴ There are very few published studies pertaining to family leprosy conducted in India and worldwide. In this study our primary objective was to determine the prevalence of familial leprosy and clinicoepidemiological features of familial leprosy.

2. Materials and Methods

This was a descriptive study conducted for a period of five years from 2013-2018 and patients were followed up for 2 years in a tertiary care centre in Karnataka. The aim of the study was to know the prevalence of familial leprosy and to know the clinicoepidemiological patterns of these cases. The study population included all new documented cases of leprosy visiting our out-patient department (OPD) during the study period. All the patients were diagnosed as leprosy on histopathological confirmation or by the presence of cardinal signs of leprosy according to the world health organization (WHO) definition.

The following definitions were used in this present study. Index case was the leprosy patient who presented to our OPD with Complaints. Family member was defined as person who lived under same roof together with index case. A detailed history with a standard proforma including patients age, sex, demographic details, clinical features, complications were collected. All the family members of the index case were called to OPD and detailed history (including of past history of leprosy treatment) and clinical examination was done. Any suspected leprosy case in family members were further investigated using skin biopsy for histopathological examination and Slit skin smear examination for confirmation of leprosy. The demographic details and clinical features of family members were collected only if they had histopathology suggestive of leprosy or if they met the WHO definition of leprosy. The socioeconomic status, type of residence including number of rooms in house were noted. The type of leprosy was classified using Ridley Jopling method, Indian system of classification and WHO classification. The data collected was analysed by simple descriptive statistics. Permission to conduct the study was taken from institutional ethical committee. Consent was taken from index case and family members.

3. Results

During this 5-year period a total of 302 new leprosy cases were detected in our tertiary centre. There were 18 index cases (n=18) whose family members were affected, accounting for the prevalence of 5.96%. Total number of family members with documented leprosy (old or newly detected) was 26. So, the total number of leprosy cases were 44 (index cases + family members) (Figure 1). The details of these cases are summarised in Table 1.

Borderline tuberculoid leprosy was the most common type seen in the study with 18 cases (40.9%) followed by borderline lepromatous with 16 cases (36.36%), 6(13.63%) cases of lepromatous leprosy, 2(4.54%) cases of tuberculoid leprosy, 2 (4.54%) cases of pure neuritic leprosy.

Out of the 18 families, 4 families had more than one person who was affected. 8 cases (18.18%) of Childhood leprosy (Figure 2) were noted (defined as age less than 15 years according to international federation of anti-leprosy Association 2001). Male: female ratio was 1.7:1. Important demographic and clinical data are mentioned in Table 2.

Among the index cases 4 cases (22%) of paucibacillary leprosy were seen and 14 cases (78%) of multibacillary leprosy was seen. Among the family members, 18 cases of paucibacillary leprosy were seen and 8 cases of multibacillary leprosy were seen. Conjugal leprosy (Figure 3) was seen in 10 families accounting for the prevalence of 3.31%. Fourteen cases of the index case belong to lower socioeconomic status. Eighteen family members were sleeping in the same room as their index cases. Out of the 44 cases, 13 cases (29.54%) had complications of leprosy.



Fig. 1: Familial leprosy



Fig. 2: Childhood Leprosy

Table 1: Demographic details of familial leprosy.

Family No	Index Case	Age	Sex	Type	Complication	Contacts	Age	Sex	Type	Complication
1	Wife	36y	Female	BT		Husband 1	45y	Male	BL	
2	Husband	55y	Male	BL	ENL	Wife 1	46y	Female	BT	
						Daughter2	34y	Female	BT	
						Son 3	32y	Male	BL	ENL
						Son 4	29y	Male	PNH	
3	Wife	36y	Female	BT		Husband 1	39y	Male	BL	
4	Brother	11y	Male	BT		Brother 1	8y	Male	BT	
5	Mother	37y	Female	LL	PCH	Son 1	13y	Male	BL	ENL
6	Husband	52y	Male	BL	ENL	Wife 1	40y	Female	BT	
7	Mother	37y	Female	LL		Son 1	13y	Male	BL	
8	Father	35y	Male	LL		Son 1	8y	Male	BT	
9	Husband	55y	Male	BL	PCH	Wife 1	47y	Female	BT	
						Son 1	19y	Male	BT	LO
10	Mother	50y	Female	BL		Son	17y	Male	BL	
11	Father	35y	Male	LL	ENL	Son 1	8y	Male	BT	
12	Husband	38y	Male	LL	ENL	Wife1	30y	Female	BT	
13	Husband	55y	Male	BL		Wife 1	46y	Female	BT	
						Son 2	34y	Male	BT	
						Son 3	31y	Male	BL	
						Son 4	28y	Male	PNH	LO
14	Brother	13y	Male	BT		Sister1	11y	Female	TT	
15	Husband	52y	Male	BL	ENL	Wife 1	50y	Female	BT	
16	Husband	55y	Male	BL		Wife 1	49y	Female	BT	
						Son 1	22y	Male	TT	
17	Mother	50y	Female	BL	ENL	Son 1	16y	Male	BL	
18	Husband	38y	Male	LL		Wife1	34y	Female	BT	

BT- Borderline Tuberculoid Leprosy; BL- Borderline Lepromatous Leprosy; LL- Lepromatous Leprosy; ENL- Erythema Nodosum Leprosium; PCH- Partial Claw Hand.

Table 2: Clinical data of Familial Leprosy

Total No. of cases	302
Index cases	18
Family members	26
Total No. of Leprosy cases	44
Total No. of TT (%)	4.55
Total No. of BT (%)	40.91
Total No. of BL (%)	36.36
Total No. of LL (%)	13.64
Total No. of PNL (%)	4.55
Total No. of complications in index cases	8
Total No. of complications in family members	4
No. of childhood leprosy	18.18
Male	29
Female	17
Male:Female	1.7:1
Index paucibacillary cases %	22.22
Family paucibacillary cases %	69.23
Index Multibacillary cases %	77.78
Family Multibacillary cases %	30.77
Conjugal leprosy	3.31

TT- Tuberculoid Leprosy; BT- Borderline Tuberculoid Leprosy; BL- Borderline Lepromatous Leprosy; LL- Lepromatous Leprosy; PNL- Pure Neuritic Leprosy.



Fig. 3: Conjugal Leprosy

4. Discussion

Leprosy is a chronic granulomatous disease caused by mycobacterium leprae known to mankind since thousands of years. It is prevalent in countries like Brazil, China and India. Since droplet infection is the most common source of infection overcrowding, low socioeconomic conditions and close contacts with the infected individuals makes familial leprosy possible. In our study the prevalence of familial leprosy was 5.96% similar to Nair et al (5.44%), Shen et al (14.2-22%), Deps et al (18.2%).⁴⁻⁶

Borderline tuberculoid leprosy was the most common type of leprosy seen in our study, but among the index cases, 14 cases (78%) belonged to multibacillary category suggesting the higher chances of family members being affected. Majority of these patients were living in houses with one or two rooms which again increased the chances of droplet infections. In our study male to female ratio was 1.7:1. In both index cases and family members males were more commonly affected. This could be due to more common outdoor exposure of males due to the nature of their occupations. A total of 8 children were affected in our study out of which 4 cases were having exposure with multibacillary leprosy patients and 2 children had contact with paucibacillary leprosy patients. These children contracted infection mostly from their parents. This is in accordance with many previous published studies where children with leprosy had contact with multibacillary cases more commonly than paucibacillary cases.⁷

Even though Lepra reactions in children is uncommon, our study had 2 cases of childhood leprosy with Erythema nodosum leprosum (ENL). ENL has been reported in 0 to 3.1% of all the cases of childhood leprosy.⁷ All the children included in our study were males, which is in concordance with the previous studies done.^{8,9} The reason for occurrence of leprosy more commonly in male children is unknown.

Conjugal leprosy was seen in 10 families in our study with prevalence of 3.31%. Conjugal leprosy, though reported to be uncommon has a prevalence between 0.33 % to 7.8%.^{10,11} The average duration of contact with the spouse was 16.6 years before contracting the disease. Conjugal leprosy is an enigma in the epidemiology of leprosy. Prolonged intimate exposure among the couple is a definite risk factor for transmission of leprosy yet, the prevalence of conjugal leprosy is not as high as it were expected to be.

5. Conclusion

Due to the combined efforts of many dermatologists, the incidence and prevalence of leprosy have dropped to a great extent over the past few decades. But we must still have an eye out for possible leprosy cases which could be missed if thorough examination is not done. Our study intends to emphasize the importance of examining the close contacts of a case of leprosy, especially the family members in whom the incidence of leprosy could be very high. By way of identifying leprosy cases early in its course we may be able to prevent deformities to a great extent. So, active surveillance of the at-risk contacts (family members) has to be carried out and should be subjected to detailed examination.

6. Source of Funding

No external funding was received to carry out this work.


7. Conflict of Interest

None declared.

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Dilip Kumar N R, Assistant Professor  <https://orcid.org/0000-0003-1959-0787>

Author biography

Shashikiran A R, Consultant Dermatologist

Laxmi B Horatti, Assistant Professor

Cite this article: Shashikiran A R, Horatti LB, Kumar N R D. A clinicoepidemiological study of familial leprosy. *IP Indian J Clin Exp Dermatol* 2021;7(3):261-265.