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Clinical profile and deformities in leprosy patients: a record based study

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ABSTRACT

Background: Leprosy is a chronic disease caused by *Mycobacterium leprae*, infectious in some cases, and affecting the peripheral nervous system, skin and certain other tissues. Even though leprosy was declared eliminated as a public health problem in India on December 2005, new cases of leprosy continue to appear. Hence a study on clinical profile and deformities in all leprosy cases registered in the last 5 years was done to know the current status of leprosy in this area

Methods: This was a retrospective record-based study of leprosy cases done at Government Medical College, Manjeri, for a period of 5 years from October 2014 to September 2019.

Results: 42 cases from the record were included in the study. Maximum cases belonged to the age group of 31 to 40 and males were more than females. 81% of the patients were multibacillary leprosy (MB) and 8 cases belonged to paucibacillary (PB) leprosy. Four child cases were registered as PB cases. Mostly encountered clinical diagnosis was borderline tuberculoid leprosy (23 out of 42) and two had type 1 reaction. Seven patients had deformity of which two had grade 2 deformity and rest had grade 1 deformity.

Conclusions: One patient who presented with grade 2 deformity and type 1 reaction was from tribal area indicating low awareness about leprosy among them. More number of cases in the multibacillary group and presence of child cases and deformities reinforces the need for strict surveillance to eradicate leprosy.

Keywords: Leprosy, Deformities, Clinical profile, Multibacillary, Paucibacillary

INTRODUCTION

Leprosy is a chronic granulomatous disease caused by *Mycobacterium leprae* and it mainly affects the skin and peripheral nervous system. India continues to account for 60% new cases reported globally each year. The World Health Organisation (WHO) Expert Committee on Leprosy at its seventh meeting in 1997 defined a case of leprosy as follows;⁴

"A case of leprosy is a person having one or more of the following features and who has still to complete a full course of treatment".

- Hypopigmented or reddish skin lesion(s) with definite loss of sensation.
- Involvement of the peripheral nerves, as demonstrated by definite thickening with loss of sensation.
- Skin smear positive for acid-fast bacilli.

The disease is classified into five types according to immunological status. They are tuberculoid, borderline tuberculoid, mid-borderline, borderline lepromatous, and lepromatous leprosy.⁵ Cardinal features of leprosy and the presence and number of bacilli determine the type of disease.⁶ For treatment purpose, the disease is broadly

classified into paucibacillary (PB) and multibacillary (MB) leprosy by WHO. PB leprosy comprises cases with 1 to 5 skin lesions, single nerve trunk involvement, and AFB negativity. MB leprosy includes cases with more than 5 skin lesions, two or more nerve trunk involvement, and acid-fast bacilli (AFB) positive cases.⁷

Nerve damage is the most characteristic feature of the disease and the common clinical manifestations are due to sensory loss, followed by motor loss. Long nerves of the hands and feet are affected first, which later get firm, hard and fibrosed. Due to these deformities the disease is associated with considerable social stigma even now. Deformity is the visible alteration in the form, shape or appearance of the body due to impairment produced by the disease. In leprosy, deformity may be so insidious and painless and obvious only in late stages. Multi bacillary leprosy and presence of reaction increases the risk of developing deformities. Hero graded deformity as Grade 0-no deformity, Grade1- no visible deformities (only anesthesia) and Grade 2- visible deformity.

Due to the efforts of National Leprosy Eradication Programme (NLEP), the prevalence of leprosy in India has reduced from 57.8 of 10,000 population in 1983 to 0.66 of 10,000 in 2016. However, India continues to account for 60% new cases reported globally each year.² Even though leprosy was declared eliminated as a public health problem in India on December 2005 new cases of leprosy continue to appear.¹² We aimed to study the clinical pattern of leprosy and the deformities registered for a period of 5 years to know about the current status of leprosy elimination in our area.

METHODS

Study design

This study was retrospective descriptive record-based study.

Inclusion criteria

All new cases registered in the Leprosy Centre Government Medical College, Manjeri from October 2014 to September 2019.

Exclusion criteria

Patients on treatment and relapse cases were excluded.

Methodology

The study was conducted in the Department of Dermatology and Venereology, Government Medical College Manjeri after receiving clearance from the Institutional research and institutional ethics Committees. It was a record-based study of 5 years and 42 newly registered cases during the period were included in this study after due permission from Hospital Superintendent,

through Head of the Department. Data collected from the leprosy register of Leprosy Centre, Government Medical College, Manjeri, during that period. The leprosy centre record followed the classification proposed by Ridley and Jopling (1966) and Indian Association of Leprologists (IAL) classification (1981), subdividing leprosy to tuberculoid (TT), borderline tuberculoid (BT), mid (BB), borderline lepromatous borderline lepromatous (LL), indeterminate (HD-I) and pure neuritic (PN).^{5,7} For treatment purpose leprosy was grouped into MB and PB as per WHO guidelines. Data entered as per age, sex, occupation, presenting complaints, presence or absence of reaction at the time of presentation, number of skin lesions, number of nerves thickened, AFB smear result, clinical diagnosis, WHO classification, type of deformity and grading of deformity.

Descriptive statistics were produced for demographic, clinical, and laboratory characteristics for this study sample of patients. Quantitative variables were expressed as mean values and standard deviations, qualitative variables were summarized as counts and percentages. Data analysis was performed using Microsoft Excel and R software (R version 3.6.1 (2019-07-05).

RESULTS

Study included 42 patients and maximum number of patients (16) belonged to the age group of 31 to 40 years (33.3%). Minimum age observed was 8 yrs. and maximum age was 66. Four patients belonged to pediatric age group (9.52%). Mean of age was 34.1 and the standard deviation noted was 13.9 (Table 1). 29 patients were male (69%) and 13 patients were female which constituted 31% of the study population. Review of occupation of the patients showed more than half of study population (22 patients) was manual laborers (52.4%). Next larger group included 9 home makers (21.4%). Students constituted 16.7% (7 patients) others were (9.5%) which included employees in government and private sector including workers from health sector. (Table 2).

Table 1: Age distribution.

Age in years	Frequency	Percentage (%)
≥10	1	2.4
11-20	6	14.3
21-30	9	21.4
31-40	14	33.3
41-50	7	16.7
51-60	3	7.1
61-70	2	4.8
Total	42	100

Analysis of presenting complaints of the 42 cases showed 33 (78.6%) presented with skin lesions and seven patients (16.7%) came with other complaints and 2 patients (4.8%) presented with symptoms of reactions and its

complications (Table 3). Most of the study group had less than or equal to 5 skin lesions which constituted 73.8% (31 patients) and rest 11 patients (26.2%) had more than 5 skin lesions (Figure 1). Review of records for the number of thickened nerves showed 20 patients had multiple nerve thickening (47.6%) and single nerve was thickened in 13 patients (31%). In 9 patients there was no nerve thickening (21.4%) (Table 4). Out of the 42 cases only 6 were smear positive (14.3%) and 36 cases (85.7%) were smear negative (Table 5).

Table 2: Occupation.

Occupation	Frequency	Percentage (%)
Student	7	16.7
Home maker	9	21.4
Manual labor	22	52.4
Others	4	9.5
Total	42	100

Table 3: Presenting complaints.

Presenting complaints	Frequency	Percentage (%)
Skin lesion	33	78.6
Reaction	2	4.8
Others	7	16.7
Total	42	100

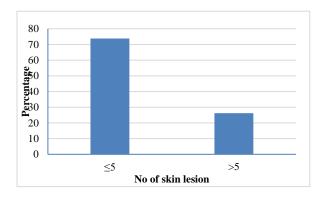


Figure 1: Number of skin lesions.

Table 4: Nerve thickening.

Number of nerves	Frequency	Percentage (%)
No nerve	9	21.4
Single	13	31
Multiple	20	47.6
Total	42	100

Table 5: AFB smear.

AFB	Frequency	Percentage (%)
Positive	6	14.3
Negative	36	85.7
Total	42	100

Clinical diagnosis evaluation of study group showed larger number (23 patients) belonged to borderline tuberculoid (54.8%) and only one patient was pure neuritic (2.4%). Other observations were tuberculoid tuberculoid 3 patients (7.1%), mid borderline 6 (14.3%), borderline lepromatous 5 (11.9%) and lepromatous lepromatous (4 cases) 9.5% (Table 6). WHO classification of the cases for treatment purpose showed most of the cases (34) belonged to MB (81%) and 8(19%) cases belonged to PB (Table 7).

Table 6: Clinical diagnosis.

Clinical diagnosis	Frequency	Percentage (%)
TT	3	7.1
BT	23	54.8
BB	6	14.3
BL	5	11.9
LL	4	9.5
PN	1	2.4
Total	42	100

Table 7: WHO classification.

WHO classification	Frequency	Percentage (%)
PB	8	19
MB	34	81
Total	42	100

Table 8: Lepra reaction.

Lepra reaction	Frequency	Percentage (%)	
Absent	40	95.2	
Present	2	4.8	
Total	42	100	

Table 9: Presence of deformity.

Deformity	Frequency	Percentage (%)
Present	7	16.7
Absent	35	83.3
Total	42	100

Table 10: Grading of the deformity.

Grade of deformity	Frequency	Percentage (%)
0	35	83.3
1	5	11.9
2	2	4.8
Total	42	100

Two patients had lepra reaction at the time of presentation (4.8%) and both had type 1 reaction (Table 8). Most of the patients had no deformity (35 out of 42 cases) constituting 83.3% and seven had deformity

(16.7%) (Table 9). Grading of the deformity as per WHO scoring showed grade 0 in 35 (83.3%) and 5 patients (11.9%) had grade 1 deformity and two had grade 2 deformity (4.8%) (Table 10).

DISCUSSION

Leprosy being a chronic disease is one of the public health problems due to the social stigma and due to the disability associated. In this study, age, sex group distribution are in accordance with the epidemiology of leprosy reported in literature. 1,13-16 The age of the patients varied from 8 to 66 years, similar to the observation by Thakkar et al.¹⁷ Maximum number of patients belonged to the age group of 31-40 years followed by 21-30. Similar pattern is observed in others studies also. 18-20 There were 4 children (9.5%) out of the 42 patients indicating an active transmission of the disease as leprosy detection in children below 15 years old is a strong indicator of recent transmission by active sources of infection.²¹ Male to female ratio was 2.23:1 and general pattern of male preponderance as found by several others.^{22,23} The higher preponderance in male indicates their more vulnerability because of greater mobility and increased opportunities for contact in big population.²⁴

Occupational grouping showed its occurrence was more in manual laborers. The second main group of patients was home makers reinforcing the need of more effective ways to increase the awareness among these groups and thereby enabling the health care system to detect cases early. Even though most of the patients were with 5 or less number of skin lesions nearly half of them had multiple nerve thickening. This may be the reason for more of MB cases in the study group. Increase in MB cases may also be due to late identification of leprosy cases and is an eye opener to strengthen the control measures. Nerve involvement was seen in 33 patients (78.57%). This proportion is higher than a study from Dakar and in the study by Kadam et al which showed 68.49% and 50% respectively. ^{16,25}

The mostly encountered clinical diagnosis was borderline tuberculoid. Several studies by Thakkar et al, Sharma et al, Shenoi et al, Nadkarni et al and Moorthy et al observed that maximum cases occur in the borderline group. 17,26-29 All the 4 child cases were paucibacillary that may be due to the effectiveness of active surveillance in schools leading to early detection. Two cases of borderline tuberculoid leprosy had type 1 lepra reaction at the time of presentation. Type 1 lepra reaction in borderline cases is an indicator of unstable immune status of border line leprosy. 1

In our study grade 1 deformity was more common similar to that reported in a study from West Bengal³⁰. MB leprosy cases were having higher percentage of deformities than PB patients. It is similar to the results of a study conducted by Chhabra et al and Dhanaselvi et al.^{31,32} Two cases had grade 2 deformity and one of them

had type 1 lepra reaction. The same patient was from tribal colony and had claw hand at the time of presentation. Claw hand was the commonest deformity secondary to type 1 lepra reaction noted in the study from West Bengal.³⁰ Presence of index multibacillary case with type 1 reaction and deformity in tribal colony should be addressed for an active surveillance in that area. Grade 2 deformity noted was 4.8%, higher than national and state average. This is an indicator for active community awareness about leprosy for early detection and treatment to prevent the deformity and to prevent the spread of disease.

CONCLUSION

Although leprosy is eliminated in India, new cases are being continuously reported in all the areas. Our study shows the current status of leprosy in a tertiary care hospital in Kerala, India. A rise in the proportion of multibacillary cases, which is also observed in other parts of the country, is a matter of concern in this study also. More number of MB cases and presence of child cases indicate continued transmission suggesting the need for continuation of community based surveillance. Presence of deformity especially grade 2 deformity should be addressed due to the stigma and the potential of leprosy to cause permanent and progressive disability. More health awareness is needed in special groups like tribal colonies to avoid late presentation with complications.

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institutional ethics committee

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