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Original Article

Clinico–epidemiological profile of patients of Hansen's disease in a tertiary care centre in West Bengal

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Abstract

Objective To determine clinical patterns of Leprosy, to evaluate post disease complications, to establish clinico-bacteriological correlation, to analyse the demographic profile of the study group and to determine the changing trend in pattern in the disease if any.

Methods Ours was a cross sectional study and patients between 15 to 60 years of age, attending Dermatology, Venerology and Leprosy clinic, diagnosed with leprosy between April 2018 to March 2019, were included in study by convenient sampling and their demographic profile, history, general and dermatological examination were recorded and slit skin smear, biopsies were performed before arriving at final diagnosis.

Results Borderline tuberculoid (BT) was found to be the most common clinical type (57%), multibacillary leprosy was more prevalent than paucibacillary leprosy with ratio of 3:2, and type 1 reaction was more common in Borderline Tuberculoid and type 2 reactions in Lepromatous Leprosy. 76% patients had nerve involvement at the time of presentation, and 47% had visible deformities.

Conclusion In conclusion, when slit skin smear is not decisive and facilities for PCR are not accessible, a constellation of clinical and histological symptoms revealed to be crucial in the diagnosis of leprosy.

Key words
Hansen's infection; Borderline tuberculoid; Reactions; Deformities.

Introduction

Leprosy, also called Hansen's disease, is brought on by bacteria Mycobacterium leprae and mostly affects the peripheral nerves, as well as the skin, muscle, eyes, bones, testes, and other internal organs. Leprosy is one of the most feared and stigmatised diseases since it results in a variety of physical and psychological impairments. Despite being declared eliminated (PR< 1/10,000 population) since December 2005, there have been significant changes in the disease's pattern of leprosy over the past ten years, and it still has a prevalence more than 1/10000 in Dadra and Nagar Haveli, Chhattisgarh, Bihar, Maharashtra, and West Bengal.[1] By continuous increase and decrease in number of cases indicative of insufficient care and delayed diagnosis of leprosy, the Burdwan district has demonstrated a distinct pattern in terms of New Case Detection and Grade-II deformity. The current study's objectives were to analyse clinical and epidemiological patterns of patients with Hansen's infection at an Urban Leprosy Center (ULC) in Burdwan district of West Bengal over the course of a year beginning

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in April 2018 and to interpret this data in light of various epidemiological variables like age, sex, type of disease, deformity, etc.

Subjects and Methods

Our study was an institution based cross sectional study, initiated after clearance from Institutional Ethics Committee and all cases of Leprosy between age 15 to 60 years (confirmed by history, skin and nerve examination, slit skin smear along with biopsy except pure neuritic cases) who attended Department of Dermatology, Burdwan Medical College Hospital for a period of one year between April 2018 to March 2019, selected by convenient sampling were included. Patients who had taken Multi Drug Therapy (MDT) were considered as old patients (relapse, reinfection, defaulter etc.), whereas patients who were not diagnosed with or taken any therapy were included as new patients. After obtaining written informed consent from patients, their name, age, sex, detailed history, general survey, findings of general and dermatological examinations were noted, and provisional diagnosis was made. They were categorized clinically by Ridley Jopling classification & also bacteriologically. Apart from Lepromatous Leprosy (LL), Borderline Lepromatous Leprosy (BL), Borderline Borderline Leprosy (BB), Borderline Tuberculoid Leprosy (BT), and Tuberculoid Leprosy (TT), two more categories, Indeterminate leprosy (I) and Pure neuritic leprosy (P) were included. Where diagnosis was doubtful, diagnostic tests like biopsy, skin smear etc. were done. After collection of all data, the analysis of data by different statistical method was done by IBM SPSS Statistical software and results were presented by bar charts and diagrams.

Then various parameters like prevalence of different types of Leprosy, prevalence of multibacillary and paucibacillary Leprosy, frequency and extent of nerve involvement, prevalence of deformity and its grade, demographic parameters of the study population, reaction patterns and its association with types of leprosy, post HI complications (trophic ulcer, post HI neuropathy etc.), clinico-bacteriological correlation and changing pattern of the disease were analysed.

Results

The age of study population ranged between 15 to 60 years with highest prevalence among the 15 to 29 years age group and the mean age of study group was 36.26 years with sex ratio of 2.58:1 (Male:Female). Out of 129 patients, 90 belonged to rural background (70%) while the rest 39 belonged to suburban and urban areas (30%). According to occupation, 77 (60%) were manual worker and 52 (40%) were others. According to modified BG Prasad scale, most of the patients (48%) were from socio-economic class IV and 37% were from socio-economic class III.

The distribution of cases according to types of Leprosy based on classification by Ridley Jopling, is given in **Table 1**.

The distribution of cases based on NLEP (National Leprosy Eradication Programme)/ Ridley Jopling classification is given in **Table 2**.

Out of 93 males, most were of BT type (55%) followed by LL & BL with 16% and 15% respectively whereas 7% patients were of pure neuritic type. Out of 36 females, most were of

Table 1

Ridley-Jopling type	*TT*	*BT*	*BL*	*LL*	*Histoid*	*PN*	*Indeterminate*
No. of cases (n=129)	6(5%)	74(57%)	18(14%)	20(15%)	3(2%)	6(5%)	2(2%)

Table 2

NLEP / RJ classification	*New*	*Relapse*	*Reinfection*	*Defaulter*	*Persisters*
TT	6	0	0	0	0
BT	55	12	4	2	1
BL	13	4	0	1	0
LL	16	1	0	3	0
Histoid	3	0	0	0	0
PN	3	2	0	1	0
Indeterminate	1	1	0	0	0

Table 3

Reaction type	*TT (n = 6)*	*BT (n = 79)*	*BL (n = 18)*	*LL (n = 20)*	*Total no of patients*
Type-1	4	23	5	0	31 (24%)
Type-2	0	0	5	15	20 (16%)

Table 4

No of visible deformities	*Trophic Ulcer*	*Clawing (hand & foot)*	*Foot drop*	*Toe deformity & resorption*	*Wrist drop*	*Facial deformities*
69 (53%)	43	9	2	9	1	5

BT type (62%) followed by LL & BL with 14% and 13% respectively whereas 8% patients were of tuberculoid type.

52 cases (40%) were pauci-bacillary and 77 (60%) were multibacillary (71 slit skin smear positive cases and 6 pure neuritic type). Out of 74 BT patients, only 30 patients (40.54%) had positive slit skin smear whereas BL and LL patients showed 100% slit skin smear positivity. The distribution of patients according to reaction type in various spectrum is given in **Table 3**.

The distribution of cases according to disability is given in **Table 4**.

43 patients had a positive history of overcrowding and amongst them 22 had multibacillary (MB) leprosy and 21 had paucibacillary leprosy.

Discussion

The male to female sex ratio in the present study is similar to the study conducted by Jayanta Kumar Barua *et al.*[2] All studies showed male preponderance like ours **(Table 5)**. The most common age-group in our study is comparable to other studies conducted previously. The low attendance of female patients may be due to social and cultural restrictions or due to fear of stigma.

In our study, 60% were manual workers (i.e., farmers, manual labourers, day-labourers, rickshaw-pullers, van-pullers, hawkers, carpenters etc.). Study conducted in a tertiary care centre of West Bengal[7] showed that 28.7% of study population were manual workers. In a meta-analysis by Julia Moreira Pescarini *et al.*,[8] there was a positive, but not statistically significant, association between leprosy and occupation. A study published in American Journal of Dermatology[9] showed that leprosy was more commonly seen in low socio-economic group.

Table 5

Studies	*Sex ratio (M:F)*	*Age group (in years)*
Present study	2.58:1	15-29
Sushil Kumar K *et al.* [3]	1:1.1	3rd decade
Sejal Thakkar *et al.* [4]	1.7:1	17-40
Vipul Vora *et al.* [5]	1.83:1	20-40
Barua *et al.* [2]	2.3:1	11-70
Singh AL *et al.* [6]	2.08:1	30-40

In the present study WHO type of leprosy was to be significantly associated with socioeconomic class with MB type being more common in Category B class. (X2- 8.903; df- 1; p= 0.003).

In our study, 43 patients (34%) had history of overcrowding and 85 patients (66%) did not have a history of overcrowding. 32 patients (25%) had history of contact and among them 15 had multibacillary and 17 had paucibacillary leprosy. In a study by Ojha KS *et al*;[10] it was found that almost 40% had a positive history of contact and almost 84.5% patient had a history of overcrowding. In another study by B.N. Reddy *et al.*[11] only 25.9% gave the history of contact and is comparable to the present study.

It is evident from **Table 6** that the commonest type of leprosy found in our study is same as that of most of the studies conducted in India. The relative prevalence of BT in our study is nearly same as that of the study conducted by Barua *et al*.[2] This concordance in results can be explained by same geographical area included in both studies.

Based on NLEP classification, new cases were found to be the most common type (75%) followed by relapse (16%) and defaulters (5%). Reinfection cases were 3% and 1% were Persisters. In a study by Barua *et al*;[2] it has been found that most cases were new (94.2%), 3.8% were defaulters and 1.9% were having a relapse after completion of treatment. In another study by Singh AL *et al*;[6] defaulters were 8.45%. These variations in relapse and defaulter percentage might be due to false history by the patients about their previous treatment and inadequate documentation of previous treatment.

Based on slit skin smear reports, most patients were multibacillary (60%). In a study by Barua *et al*;[2] 70.2 % cases were multibacillary depending on the slit skin smear report which is in accord with our study. Clinico-pathological correlation was noted in most cases. Out of total 129 patients, 31 (24%) patients showed disparity. Amongst those 31 patients 25 patients belonged to borderline spectrum. This is similar to a study done by Sejal Thakkar *et al*.[4] showing clinicopathological correlation in 60% of patients with maximum disparity (52.9%) in the borderline leprosy. Kar *et al.*[12] in their study observed total parity in 70%. They also observed highest parity in stable poles.

In our study, Type 1 reaction was most common reaction type and also more common in Borderline Tuberculoid patients and Type 2 reaction was most common in LL patients. In a clinicodemographic study of lepra reaction by Avijit Mondal *et al.*,[13] it was found that 18.4% had lepra reactions and Type 1 reaction was seen more in BT patients (50%), whereas Type 2 reaction was in LL patients (32%). In a study by Van Brakel WH *et al.*[14] in West Nepal, it was found that on first examination, the prevalence of reversal reaction was 28% and prevalence of ENL reaction was 5.7%.

Out of 129 patients, 98 patients (76%) had nerve involvement. 65 patients (50%) had single nerve involvement and 33 patients (26%) had multiple nerve involvement. Common peroneal nerve was the most commonly involved nerve followed by ulnar and median nerves. As per Michael Donaghy's observation,[15] the proportion of patients who have one or more enlarged nerves can range from 20% to 96%. It can be seen in either the ulnar or common peroneal nerve in more than 90% of individuals with nerve enlargement.

In our study, 60 patients (47%) presented with visible deformities (WHO Gr.-2) and 69 patients (53%) did not have any visible deformity (WHO Grade -0 & 1) and various disability and deformities detected in our study is given in

Table 4. In the study by Sehgal VN *et al.*[16] it was found that the reported grade 2 & 3 disability rates in India vary from 16% to 44%. In another study done in Ethiopia by Tigist Shumet *et al.*,[17] it has been found that the prevalence of disability was about 65.9% among all patients. According to comparable research by A K Nayak *et al.*,[18] the majority of the 92 patients investigated (60.86%) had a WHO grade 0 or grade 1 deformity. 39.13% of the study population had visible abnormalities (WHO grade 2 deformity). The most prevalent deformity among individuals who had visible deformities was trophic ulcer (21.73%), followed by claw hand. This somewhat greater prevalence of obvious deformity in the current research may be the result of patients' delayed reporting since they often do not go immediately to a tertiary care institution.

Conclusion

Effective treatment in the form of MDT is well available and accepted worldwide for treatment of leprosy and we are now in the post elimination era through NLEP (National Leprosy Eradication Program). However, there are still some problems to overcome for proper implementation of this program and this result in the variation in ANCDR (annual new case detection rate) amongst different districts of this state. The most important factor deciding complications in leprosy is early diagnosis and appropriate treatment and for that, not only community health workers but also the Medical Officers of peripheral hospitals should have a proper knowledge to diagnose a case of leprosy and to prescribe a proper regime for treatment. Controversial and suspected cases should be referred to experts (Dermatologists or other MOs who has a special training in leprosy) without any delay and biopsies should be considered in selective patients who do not have a clear-cut clinical diagnosis. Reactions should be diagnosed at the earliest. Patient should get MDT as soon as possible (at the very first visit if possible) and regular supply of MDT should be ensured, and timely intervention should be done in case of neuritis with oral corticosteroid to prevent nerve damage with long term complication like deformity. Adequate follow-up during surveillance period should be ensured in each and every case so as to detect relapse early. Post treatment microbiological and histopathological assessment should be considered at least in tertiary centers to evaluate the therapeutic response. Disability limitations and rehabilitation should be ensured by deformity correction surgery, self-care kit etc.

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