



**A CLINICO-EPIDEMIOLOGICAL STUDY OF LEPROSY IN A TERTIARY CARE CENTRE**

**Vijay Kumar Sonkar\***

M.D Skin & V.D S.N Medical College Agra

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**ABSTRACT**

A Clinico -epidemiological study of 316 patients of leprosy who sought medical advice at the OPD SN Medical college Agra, during June2016 - Dec 2017 is reported. Among all the cases, 88.6% were new cases, 7.2% were defaulters and 4.2% were having a relapse after completion of treatment. Around 37.9% of them had borderline tuberculoid type. An important finding was that prevalence of BL & LL cases before the age of 50 years is about 40.2% but beyond this age the prevalence is 11.0%. Depending on slit skin smear report 258 (81.6%) cases were multibacillary leprosy. The disease was found 3.8 times more often in males than in females and was found mainly in the age group 11-70 years. Lepra reactions were seen in 36 (11.4%) cases, of which 26 (72.2%) had type 1 reaction and 10(27.8%) type 2 reaction. Another significant finding was the occurrence of lepra reactions (both type I & II) in multibacillary type of leprosy (n=24) than in paucibacillary type. Among the 258 patients with multibacillary disease 39 (15.11%) developed deformity and most (84.2%) would have more severe and permanent deformities.

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**INTRODUCTION**

Leprosy is a chronic disease caused by Mycobacterium leprae. It is an infectious disease mainly affecting the peripheral nerves. It also affects the skin, muscles, eyes, bones, testes and internal organs<sup>[1]</sup> The National Leprosy Control Programme was launched in 1954 in India and converted to National Leprosy Elimination Programme (NLEP) in 1983 with the objective to eliminate leprosy.<sup>[1]</sup> The South East Asian region accounts for about 66.21% of the global prevalence and 71% of all new detected cases.<sup>[2]</sup> With the introduction of MDT (Multi Drug Treatment) since 1983, India has achieved the goal of elimination of leprosy in December 2005.<sup>[3]</sup> A total of 0.92 lakh cases are on record as on 1st April 2013, giving a Prevalence rate (PR) of 0.73 per 10,000 population.<sup>[4]</sup> The aim of present study was to find out the clinical presentations of leprosy patients in an urban leprosy centre (ULC) in SN Medical college Agra, from June2016 - Dec 2017, and to interpret this data with respect to different epidemiological variables like age, sex, type of disease, deformity, reaction etc.

**MATERIAL & METHODS**

For this study, case records of patients attending Leprosy OPD SN Medical college Agra, during June2016 - Dec 2017 were analysed.

\*Corresponding author: **Vijay Kumar Sonkar**  
M.D Skin & V.D S.N Medical College Agra

Their age, sex, mode of presentation, history of any household contacts, presence or absence of any deformities, history of treatment and the occurrence of any subsequent lepra reaction<sup>9</sup> was noted.

Patient with clinical signs of leprosy who had not received multi-drug therapy previously, was called a "New" case. Any patient with leprosy, who had received MDT previously but had not completed the therapy, was called a "Defaulter". When a patient developed new signs and symptoms of the disease even after receiving an adequate course of MDT, was called a "Relapse" case. Deformities when present were graded based on WHO grading system. If neither anaesthesia, nor any visible deformity was present, it was called Grade 0. Grade 1 deformity signified the presence of anaesthesia alone. Grade 2 signified presence of visible deformities like claw hand, foot drop etc. The cases were classified clinically according to Ridley and Jopling classification<sup>7</sup>. A further classification into multi-bacillary and pauci-bacillary cases was done after review of the slit-skin smear report<sup>8,11</sup>. Depending upon whether they had received treatment previously or not they were classified as a new case or as a defaulter. Cases of lepra reaction are subdivided into type I and type II cases, depending upon the clinical manifestations.

Sudden appearance of erythematous and raised plaques in pre-existing lesions or appearance of new lesions, development of neuritis while under chemotherapy was categorised as type I (reversal) reaction. Development of crops of painful erythematous papules along with fever and other systemic

manifestations was categorised as Erythema nodosum leprosum or type II lepra reaction.

**RESULTS**

Out of three hundred sixteen leprosy cases attending Leprosy OPD, 93 occurred in females and the rest in males (M:F = 3.4:1). Among these 316 patients 28 (8.8%) were clinically diagnosed as pure tuberculoid (TT) type, 120 (37.9%) as borderline tuberculoid (BT) type, 94(29.7%) as borderline lepromatous (BL) type and 14(4.4%) as pure lepromatous (LL) type. 4 (1.3%)case of mid borderline and 2(0.6%) cases purely neuritic type of leprosy was found. [Table 1].

**Table 1**

Distribution of leprosy types	
TT	28
BT	120
BB	4
BL	94
LL	68
PNL	2
Total	316

Depending on slit skin smear report 258 (81.6%) cases were multibacillary leprosy and 58 (18.4%) cases were paucibacillary leprosy.

Among the 316 patients 280 were new cases, 23 people were defaulters and 13 were relapses. All defaulter and relapse cases had a history of receiving chemotherapy. Among the thirteen relapse cases, 6 presented with pure lepromatous type and 7 with BL type of disease. 5 of the defaulter cases presented with LL type, 10 BT type and 8 with BL type of leprosy. All the patients who had relapse had multibacillary type of disease, as did the defaulters.

Among the 120 borderline tuberculoid patients, in 36(30%) cases slit skin smear report showed paucibacillary type of leprosy. The rest (70%) were multibacillary type of leprosy. All the Borderline lepromatous cases or pure lepromatous cases were multibacillary type on slit skin smear. However Six cases, which were clinically diagnosed as pure tuberculoid type of leprosy, showed multibacillary type on slit skin smear and received chemotherapy for a period of twelve months.[Table 2] Two among them was in paediatric age group.

**Table 2**

	Distribution of leprosy types						
	TT	BT	BB	BL	LL	PNL	Total
Multibacillary	6	84	4	94	68	2	258
Paucibacillary	22	36	0	0	0	0	58
Total	28	120	4	94	68	2	316

The distribution of various types of leprosy in different age groups is given in [Table 3].

**Table 3**

	Distribution of leprosy types according to age						
	TT	BT	BB	BL(MB)	LL(MB)	PNL	Total
01 -10 yrs	2	3	0	2	0	0	7
11- 20 yrs	4	13	0	11	6	0	34
21- 30 yrs	6	22	1	17	14	1	61
31- 40 yrs	5	34	2	23	18	1	83
41- 50 yrs	7	26	1	24	12	0	70
51- 60 yrs	4	12	0	8	9	0	33
61- 70 yr	0	8	0	6	5	0	19
71 & above	0	2	0	3	4	0	9
Total	28	120	4	94	68	2	316

Among the 316 leprosy cases 24 cases occurred in the paediatric age group, Among these 24 patients 4 (3.3%) were clinically diagnosed as pure tuberculoid (TT) type, 10 (41.7%) as borderline tuberculoid (BT) type, 8(33.3%) as borderline lepromatous (BL) type and 2(8.3%) as pure lepromatous (LL) type, on slit skin smear examination 16(67.7%) were found to be paucibacillary type and the rest 8 (32.3%) multibacillary type.[Table 4]

**Table 4**

Distribution of cases in paediatric age group (01-18yrs)	
TT	4
BT	10
BB	0
BL	8
LL	2
PNL	0
Total	24

All TT cases were associated with involvement of a single body region, face and neck being the most common site of involvement (n=28). On the other hand LL cases involved more than one body site, with face (n=68) being involved in all cases and trunk involved in the majority (n=56). Leg is the most commonly involved site in BL cases (n=74) followed by trunk (n=20). Upper (n=70) & lower extremities (n=50) are most commonly involved in BT cases and involvement of face & neck (n=32) is less common.

At the initial presentation 103 patients presented with various kinds of deformities. Fourty (38.8%) patients presented with anaesthesia of the involved region. Among them 20 (19.4%) had BT type and 12 (11.6%) had BL type of disease. The 12 BL case and 8 LL cases were found to be multibacillary type (19.4%) on slit-skin smear.

Sixty three (61.1%) other patients presented with more severe deformities; which ranges from trophic ulcer, claw hand, foot drop to lagophthalmos. The occurrence of these deformities and their association with various types of leprosy are given in [Table 5].

**Table 5**

	Deformities associated with types of leprosy						
	TT	BT	BB	BL(MB)	LL(MB)	PNL	Total
Grade I							
Anaesthesia	0	20	0	12	8	0	40
Grade II							
Tropic ulcer	0	7	0	8	6	0	21
Foot drop	0	6	0	6	4	0	16
Claw hand	0	8	0	5	4	0	17
Lagophthalmos	0	3	0	4	2	0	9

Presence of anaesthesia and other more severe forms of deformity are classified as grade 1 & grade 2 respectively.

During the course of chemotherapy 36 patients developed either type I (n=26) or type II (n=10) lepra reaction. Type I reaction predominantly occurred in BL cases (n=16), 24 patients out of these 26 had multibacillary type of leprosy. Ten patients developed type II lepra reaction. Eight out of these ten had LL type and two BL type of leprosy. All had multibacillary type of disease microscopically.[Table 6]

Another significant finding was the occurrence of lepra reactions (both type I & II) in multibacillary type of leprosy (n=22) than in paucibacillary type.

**Table 6**

Association of lepra reaction with type of disease							
	TT(PB)	TT(MB)	BT(PB)	BT(MB)	BL(MB)	LL(MB)	Total
Type I	0	0	2	8	16	0	26
Type II	0	0	0	0	2	8	10

## DISCUSSION

Between the months of June 2016 - Dec 2017, we received 316 patients in OPD SN Medical college Agra, with a male female ratio of approximately 3.4:1, clearly showing a male preponderance. Around 81.6% of people suffered from multibacillary leprosy. Arora et al reported 63-69% cases of multibacillary leprosy. [5] Among all the cases 88.6% were new cases 7.2% were defaulters and 4.2% was having a relapse after completion of treatment. All of the defaulter and relapse cases had a history of receiving MDT. Although the clinical presentation in such cases varied from pure lepromatous through borderline tuberculoid type, all had multibacillary type of leprosy, emphasizing the significance of both the presence of an effective immune response and the continuation of MDT for the recommended duration, for cure of the disease.

The distribution of leprosy cases in different age group follows a normal distribution curve, with few cases occurring at the extremes of age and greater number of cases occurring between 20-50 years of age.

When we compare the clinical diagnosis with microbiological one, it becomes apparent that a significant number of cases which were clinically diagnosed as BT patients have multibacillary leprosy (70.0%).

All these patients required 12 months of treatment with MDT for cure, emphasizing the role of a microscopical diagnosis in BT leprosy. On the other hand all the cases that were clinically diagnosed as BL or LL cases clinically had multibacillary type of leprosy. One intriguing finding was the presence of a small number of pure tuberculoid cases (n=6) who were multibacillary type on microscopy. One explanation could be that such cases were diagnosed early and would eventually develop into borderline tuberculoid cases unless treated.

About 12.6% and 19.9% patients presented with Grade 1 (anaesthesia) or Grade 2 deformities respectively on initial presentation; 6.6 % presented with trophic ulcer, 5.0% presented with foot drop and 5.4% with claw hand and 2.8% with lagophthalmos. 44 (13.9%) cases where deformities were present were clinically diagnosed as BT patients and 35(11.0%) cases as BL patients. TT patients did not present with any deformities. It did not show any male preponderance. Grade 1 and Grade 2 deformities<sup>10</sup> were associated with multibacillary disease in 68.2% cases and 86.4% cases respectively.

Among the 58 cases of paucibacillary leprosy only 8 (13.8%) cases developed any kind of deformity and when they did, majority (66.2%) would have only anaesthesia. On the other hand among the 258 patients with multibacillary disease 55 (21.3%) developed deformity and most (78.7%) would have more severe and permanent deformities.

This indicates that patients with multibacillary leprosy are more prone to develop permanent deformities early in the disease. Type I lepra reaction occurred twice as frequently in females (9.4%) than males (4.8%).

Whereas type II lepra reaction was more common in males (6.2%) than females (2.1%).

## CONCLUSION

This study on leprosy patients attending Leprosy OPD of S.N Medical College and Hospital Agra, corroborated several findings of other studies conducted in similar socio-economic group, which includes the distribution of disease, prevalence of deformities and their association with different types of leprosy and the association of lepra reaction with certain gender etc. This study also throws new light in showing that these deformities and lepra reaction are occurring with an increased frequency in patients with multibacillary type of disease.

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