Differences in Clinical studies in patients of Indeterminate leprosy and other Leprosy patients in Uttar Pradesh, India

Dr. Archana Singh
Assistant Professor, Department of Zoology, National PG College, Lucknow, Uttar Pradesh, India

DOI: 10.29322/IJSRP.9.05.2019.p8928
http://dx.doi.org/10.29322/IJSRP.9.05.2019.p8928

Abstract

Leprosy is one of the oldest human bacterial disease recognized by a Norwegian scientist Armauer Hansen working in Bergen in 1873. Leprosy is still one of the infectious diseases and major health problem of developing countries. Leprosy is caused by *Mycobacterium leprae*. *M. leprae* is pleomorphic, straight or slightly curved, rod shaped gram positive bacteria. It is strong acid fast bacilli and occur in the human host intracellularly. The present case control study was carried out with aim to study the suspected cases of indeterminate leprosy in clinically diagnosed patients in out patients department (OPD) of Gandhi memorial and associated hospitals. Department of Medicine at King George's Medical College, Lucknow. Study group consisting of 75 cases of indeterminate leprosy, 100 subjects of other groups of leprosy spectrum, i.e., tuberculoid leprosy to lepromatous leprosy (TT - LL), taken as disease control in this study. Since clinical findings is a prerequisite condition for further histopathological and immunological studies of suspected cases. The present case control study was carried out with aim to study the clinical aspects of all suspected subjects from the skin out patients department (OPD) of Gandhi memorial and associated hospitals. Department of Medicine at King George's Medical College, Lucknow.

Key Word: *Mycobacterium leprae*, indeterminate leprosy, Clinical

Introduction:

About 85% of Leprosy reported are in Asia and it is found that the majority (50% or more) of these cases are being detected at the stage when the only visible sign of the disease is a single lesion (Gupte, 1996 ; Peat et al., 1995; WHO, 1996). Although, it is well known that most of the single lesion paucibacillary (PB) cases may heal spontaneously without any specific treatment (Ekambaram & Sithambaran, 1977), a significant proportion of such cases may develop more severe disease and be at risk of developing nerve damage. Clinical criteria, e.g. single, hypo-pigmented or erythematous macules with vague margins and sensory impairment (Charles et al., 1997). Leprosy have broad spectrum of symptom. The clinical lesions, ranging from a small solitary hazy macule to widespread multiple shiny nodules. Indeed the manifestations

of leprosy are so varied and divergent that it is hard to believe that they are caused by one and the same micro-organism.

Since clinical findings is a prerequisite condition for further histopathological and immunological studies of suspected cases. The present case control study was carried out with aim to study the clinical aspects of all suspected subjects from the skin out patients department (OPD) of Gandhi memorial and associated hospitals. Department of Medicine at King George's Medical College, Lucknow.

Material and Methods:

Leprosy should be correctly diagnosed in its early treatable stage, long before irreversible damage to nerves has occurred. The diagnosis and successful treatment of early leprosy can be one of the most rewarding and gratifying experiences in clinical medicine.

a) Clinical Examination for Leprosy

After taking the patient's care history regarding the complaints, past treatment, duration family contact with leprosy and his/her work etc. suspected hazy areas must be viewed in a good light. Indeterminate leprosy in a dark skin is hypopigmented, sensory loss is present in the majority of leprosy patients and often occurs in the following order (Yawalkar, 1974).

Temperature → Light Touch → Pain & Pressure

Sensory deficit in the patches should be determined by touching the skin lightly with a wisp of cotton wool, a feather or the tip of a ball point pen. Touch the skin and ask the patient where he feels the touch. As the acuity of sensation varies from one part of the body to another the skin of contralateral side should be examined for comparison.

Heat sensation is tested with two test tubes – one containing hot water and the other cold, and pain sensation is tested by pin-prick. Because of the rich nerve supply to the skin of the face, sensory changes may be relatively less evident there than in other areas of the body (Binford, 1982).

The diagnosis of paucibacillary leprosy depends on these simple procedures. The presense of few, well demarcated chronic skin lesions associated with anaesthesis have suggested paucibacillary leprosy.

a.i) ***Examination of Nerves***

Palpation of the commonly involved peripheral and cutaneous nerves for the presence of thickening and tenderness. They are the ulnar nerve near the median epicondyle, greater auricular, lateral poplitial and the dorsal branch of the radial.

a.ii) ***Bacteriological Examination***

Skin smears should be taken from all patients suspected of having leprosy in any form (Leiker, 1983).Bacteriological examination of nasal and skin smears is essential for classifying cases whether they are multibacillary or paucibacillary. It is also essential for monitoring the progress and defining the end-point of treatment.The glass slide should be absolutely clean. They should not be reused for making smears. It may give a false positive result (Chacko, 1980).

Observations and Findings

PART I : CLINICAL FINDINGS

All patients and disease controls had insidious onset of disease. Course of disease was progressive. Twenty five of 75 (33.3%) indeterminate cases gave a history of leprosy in the family. Twelve of 75 (16%) indeterminate cases gave history of close contact with leprosy patients either at school (2 cases) or living with leprosy patients (10 cases). Two of 75 (2.6%) Idt patients gave history of having suffered from leprosy in the past 3-4 years back for which they were treated and got cured but relapsed again.

Duration of symptoms : The duration of 75 indeterminate leprosy cases ranged from 1 month to 4 years (median = 12.09 months) and in 100 leprosy types duration of symptoms ranged from 2 months to 4 years (median = 12.4 months).

The age of the indeterminate leprosy patients (n = 75) ranged from 6 to 70 years (median age 23 years). Maximum number of cases were between the age group of 16 to 25 accounting for 38.7% of the total indeterminate leprosy cases (Table 1 Fig. 1).

Table 1 : Age distribution of indeterminate leprosy cases (n = 75)

S.No.	Age group (years)	No. of cases	% of total cases
1.	5-15	19	25.3
2.	16-25	29	38.7
3.	26-35	17	22.7
4.	36-45	2	2.7
5.	46-55	5	6.7
6.	56-65	2	2.7
7.	66-75	1	1.3

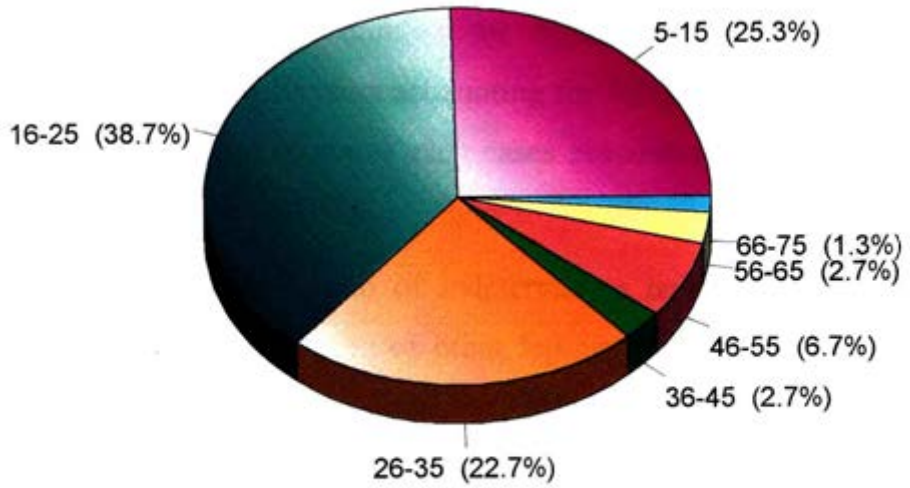

Fig. 1 : Age Distribution in Cases (Idt)

The youngest patients was 6 years male while the oldest patients was 70 years male with indeterminate leprosy.

The age distribution of other types of leprosy i.e. taken in our study as a disease control (n=100) ranged from TL (7 years to 60 years, median 25 years), BB (6 years to 50 years, median 26 years), BL (7 years to 58 years, median 26 years), LL (10 years to 65 years, median 32 years) (Table 2).

Table 2: Age distribution of different grades of leprosy patients (disease controls) individually (n=100)

Leprosy types	Age group (years)	Number	% of total types
TL (n = 20)	5-25	10	50
	26-50	9	45
	51-72	1	5
BT (n = 20)	5-25	12	60
	26-50	7	35
	51-72	1	5
BB (n = 20)	5-25	9	45
	26-50	11	55
	51-72	0	0
BL (n = 20)	5-25	9	45
	26-50	10	55
	51-72	1	0
LL (n = 20)	5-25	9	45
	26-50	6	30

	51-72	5	25

The maximum number of subjects were in case of TL, BT, BB, BL & LL between 5-25 years accounting for 50%, 60%, 45%, 45% & 45% respectively, between 26-50 years accounting for 45%, 35%, 55%, 50% & 30% and between 51-72 years in above each cases accounting for 5%, 5%, 0%, 5% and 25% respectively.

Overall male-female ratio of indeterminate leprosy cases was 3.41:1, (Table 3)The male-female ratio of other leprosy types were TL (1.8:1), BT (2.3:1), BB (1:1), BL (2.3:1) and in LL (3:1) (Table 4 Fig. 2).

Table 3 : Sex distribution of indeterminate cases (n = 75)

Sex	No. of cases	% of total cases
Male	58	77.3
Female	17	22.7

Table 4 : Sex distribution of different grades of leprosy patients (Disease controls) (n = 100)

Leprosy types	No. of cases	Male	% of total cases	Female	% of total cases
TT	20	13	65.0	7	35.0
BT	20	14	70.0	6	30.0
BB	20	10	50.0	10	50.0
BL	20	14	70.0	6	30.0
LL	20	15	75.0	5	25.0

Table 4a : Clinical findings of cases of Indeterminate leprosy

Clinical Findings	Patients (n = 75)	
	No.	%
Skin Lesions		
Macule	42	56.0
Papule	24	32.0
Maculopapular	3	4.0
Patch	3	4.0

Macule with Maculopopular lesion	2	2.7
Macule with Papule	1	1.3
Nerve involvement		
Bilateral ulnar (BU)	6	8.0
Unilateral ulnar (UU)	11	14.7
Bilateral common peroneal (BCP)	1	1.3
Bilateral U + Unilateral CP	2	2.7
Unilateral U + Unilateral GA	1	1.3
Bilateral U + Unilateral GA	2	2.7
Bilateral U + Bilateral GA	7	9.3
Bilateral U + Bilateral GA + Bilateral CP	3	4.0
Unilateral U+Unilateral GA+Unilateral CP	1	1.3
Absent	41	54.7
Hypoanaesthesia	75	100
Colour of Lesions		
Hypopigmented (H)	67	89.3
Erythematous (E)	5	6.7
Mixed type (H+E)	3	4.0
Hair Loss : Present	55/75	73.3
Absent	15/75	21.4
Anhydrosis	16/75	21.3

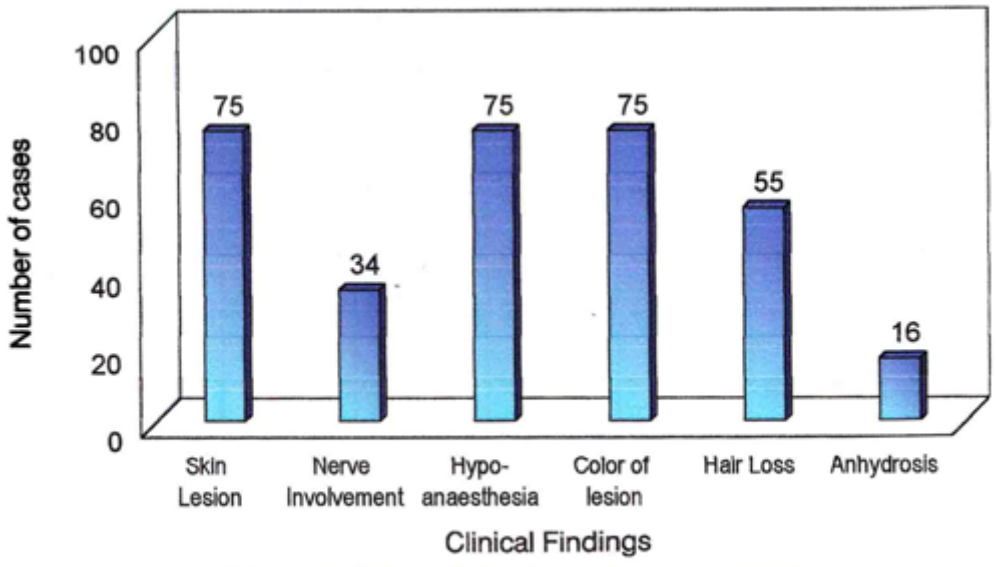

Fig. 2 : Clinical findings in cases (Idt)

Forty two of 75 (56%) indeterminate cases had macules. Twenty four of 75 (32%) cases had papules. Three of 75 (4%) cases had maculopapular lesions. Three of 75 (4%) patients had patches. Two of 75 (2.7%) patients had macule with maculopapular lesion and one other patient had macule with popular lesions (Table 4a, Fig. 2).

In case of other leprosy groups 9 of 100 cases (9%) had macular lesions. Five of 100 (5%) patients had both papule and maculopapular lesions. Three of 100 (3%) cases had plaques. Seven of 100 (7%) cases had macule with nodules. Thirty four of 100 (34%) cases had both patches and patches with macules. Only 3 of 100 (3%) cases had macules with popular lesions (Table 4 b).

Thickening of superficial nerves was detected in 34 of 75 (45.3%) Idt patients and absent in 41(54.6%) patients whereas in 100 disease controls only 78(78%) cases showed nerve involvement.

All the indeterminate patients and disease controls were hypoanaesthetic. Sixty seven of 75 (89.3%) patients had hypopigmented lesions. Five of 75 (6.7%) patients had erythematous lesions and only 3 of 75 (4%) patients had mixed type hypopigmented and erythematous lesions (Table 4a). In disease control groups 29 of 100 (29%) cases had hypopigmented.

Table 4 b: Clinical Findings Of Disease Controls (N = 100)

S.No.	Clinical findings	TT (n=20)		BT (n=20)		BB (n=20)		BL (n=20)		LL (n=20)		Total (n=100)
		no	%	no	%	no	%	no	%	no	%	
1.	**Skin Lesions**											
	Macule	4	20	4	20	-	-	1	5	-	-	9
	Papule	3	15	-	-	-	-	1	5	1	5	5
	Maculopapular	-	-	1	5	1	5	2	10	1	5	5
	Plaque	2	10	-	-	-	-	1	5	-	-	3
	Macule with nodule	1	5	2	10	-	-	3	15	1	5	7
	Path	10	50	8	40	9	45	2	10	5	25	34
	Macule with nodule	-	-	-	-	-	-	1	5	2	10	3
	Path + Macule	-	-	5	25	10	50	9	45	10	50	34
2.	**Nerve involvement**											
	Bilateral ulnar (BU)	2	10	3	15	2	10	1	5	3	15	11
	Unilateral ulnar (UU)	-	-	2	10	8	40	6	30	1	5	17
	Unilateral common peroneal (UCP)	-	-	-	-	-	-	-	-	1	5	1
	Unilateral greater auricular (UGA)	1	5	-	-	1	5	-	-	-	-	2
	Bilateral U + Bilateral CP	1	5	1	5	-	-	1	5	1	5	4

	Unilateral U + Bilateral CP	1	5	-	-	-	-	2	10	1	5	4
	Bilateral U + Unilateral CP	1	5	1	5	-	-	-	-	-	-	2
	Unilateral U + Unilateral GA	2	10	1	5	2	10	-	-	1	5	6
	Bilateral U + Unilateral GA	1	5	2	10	1	5	-	-	-	-	4
	Bilateral U + Bilateral GA	5	25	5	25	-	-	-	-	2	10	12
	Unilateral U + Bilateral GA	1	5	-	-	2	10	3	15	-	-	6
	Bilateral U + Bilateral GA + Bilateral CP	-	-	2	10	-	-	-	-	1	5	3
	Bilateral U + Bilateral GA + Unilateral CP	3	15	2	10	-	-	-	-	-	-	5
	Unilateral U + Unilateral GA + Unilateral CP	-	-	1	5	-	-	-	-	-	-	1
	Absent	2	10	-	-	4	20	7	35	9	45	22
3.	**Anaesthesia**											
	Hypoanaesthesia	20	100	20	100	20	100	20	100	20	100	100
4.	**Colour of lesions**											
	Hypopigmented (H)	10	50	8	40	7	35	2	10	2	10	29
	Erythematous (E)	6	30	6	30	10	50	12	60	14	70	48
	Mixed type (H+E)	4	20	4	20	3	15	6	30	4	20	21
5.	**Hair loss**											
	Present	12	60	11	55	8	40	16	80	18	90	65
	Absent	8	40	9	45	12	60	4	20	2	10	35
6.	**Anhydrosis**	11	55	14	70	12	60	16	80	20	100	73

(48%) cases had erythematous lesions and only 21 of 100 (21%) cases had mixed type (hypopigmented and erythematous) lesions (Table 4b).

In addition, 16 of 75 (21.3%) indeterminate cases had anhydrosis and 55 of 75 (73.3%) indeterminate cases had hair-loss (Table 4a). Other leprosy groups of 100 cases showed 73 (73%) anhydrosis and 65 (65%) hair loss (Table 4b).

Conclusion

It was concluded that correct diagnosis of indeterminate leprosy from other leprosy groups of spectrum could be made if results of clinical, histopathological, bacteriological and immunological were interpreted together. According to Sadeghi et al. (2000) lack of clinical suspicion and unfamiliarity with the histology of Idt leprosy delayed diagnosis and treatment. Leprosy should be considered in the differential diagnosis of patients presenting with unusual rheumatic and persistent cutaneous manifestations. The age of indeterminate leprosy patients ranged from 6 to 70 years (median age 23 years). Over all male female ratio

was 3.41.1. Duration of symptoms in indeterminate leprosy cases, ranged from 1 month of 4 years (median, 12.09 months).Twelve of 75 (16%) indeterminate cases gave history of close contact with leprosy patients.Forty two of 75 (56%) indeterminate patients had macules. Twenty four of 75 (32%) indeterminate cases had papules.The most interesting finding was the detection of neural involvement in 34 of 75 (45.3%) indeterminate patients and 78% disease control group, suggesting tropism of M. leprae for nural tissue. Sixty-seven of 75 (89.3%) indeterminate cases and 29% disease control group had hypopigmentation, suggesting involvement of melanocytes. Presence of anhydrosis in 16 of 75 (21.3%) Idt cases and 73% disease control group suggests involvement of sweat glands i.e. sign of autonomic nerve damage. The significant differences in clinical parameters of indeterminate and other leprosy cases suggest the requirement of histopathological and immunological studies for early diagnosis of leprosy in general and Indeterminate leprosy in particular. The early diagnosis and treatment of leprosy at indeterminate stage should be beneficial to reduce and to eradicate the leprosy from the community.

Bibiliography

1. Binford CH, Meyers WM and Walsh GP. Leprosy.*JAMA 247,2283,* 1982
2. Charles K Jab, B Baskaran, Joseph Jaya Kumar and M. Aschhoff. Histopathologic evidence to show that indeterminate leprosy may be primary lesion of disease. Int. J. Lep. and other Mycobacterial Disease 65(4): 443-449, 1997.
3. Chacko CJG (1980). In: A Manual of Leproys, R.H. Thangaraj (ed.). The Leprosy Mission, New Delhi.
4. Gupta MD. Presidential address at the XIX Biennial Conference of Indian Association of Leprologists (15-17 December, 1995, Pune). Indian J. Lepr. 68: 211-213, 1996.
5. Leiker Dl, Mc Dougall AC. Technical guide for smear examination for leprosy. pp. 7-29, Leprosy Documentation Service, Amsterdam, 1983.
6. Ekambaram V,Shithambaram M. Self healing in non lepromatous leprosy in the area of ELEP leprosy control project-Dharmapuri (Tamil Nadu). *Ind.J.Lepr*. 49:387-392,1977
7. Peat M, Brolin L, Ganapati R. An evaluation of the contribution of Swedish International Development Authority (SIDA) to leprosy control in India based on the implementation of multiple drug therapy (MDT) 1981-1993. *Ind. J. Lpr*.67:447-465,1995
8. Sadeghi P, Dupree M, Carlson JA. Delay in Diagnosis: Indeterminate leprosy presenting with rheumatic manifestations.*J.Cutaneous Medicine & Surgery* ,4; 1:26-29,2000
9. WHO. Progress towards the elimination of leprosy as a public Health Problem.WHO Weekly Epidemological Record.71(18):149-156,1996
10. WHO. Weekly Epidemological Record.14,2000
11. Yawalkar SJ. Leprosy for Practitioners, 2nd Ed. Pp.22,24,115. *Popular Prakashan, Bombay*.