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A Cross Sectional Study of Clinical and Histopathological Correlation of Patient with Different Spectrum of Leprosy from Central West India

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ABSTRACT

Background: Hansen's disease, is a chronic, infectious disease that primarily affects the skin and the peripheral nerve. Leprosy expresses itself in different clinico-pathological forms depending on the immune status of the host; diagnosis of leprosy is based on different clinical parameters which involves detailed examination of skin lesions and peripheral nerves. Demonstration of acid –fast bacilli in slit skin smears by Ziehl- Neelsen's staining also aids in diagnosis of leprosy. A reliable diagnosis hinges around a good histopathological diagnosis and demonstration of bacilli in histopathological sections. Clinical classification gives recognition only to gross appearances of the lesions, while the parameters used for the histopathological classification are well defined, precise and also take into account the immunological manifestations which enable it to successfully bridge the pitfalls in leprosy diagnosis. Histopathology provides confirmatory information for suspect cases which can be missed in clinical practice or epidemiological studies and helps in exact typing. Histology also gives indication of progression and regression of disease under treatment.

Objective: The aim of the study is to observe the patient of various spectrum of leprosy and correlate clinical findings with histopathological findings.

Materials and Method: It is a Cross sectional observational study conducted in Dept. of Dermatology, from central west India, from April 2015 to September 2016. Person with sign and symptoms of leprosy, cases with hypopigmented lesions with definitive sensory impairment, cases with erythematous papule, plaque and nodule with sensory impairment. Person with no known history of prior leprosy treatment, and willingness to do biopsy and signing the informed consent form were included. Subjects with no skin lesions, only sensory loss or thickened nerve, not giving consent for biopsy, history of prior treatment with MDT regime complete or incomplete and

patient with lepra reactions were excluded. Prevalence of Leprosy in 2014 at Maharashtra was 0.9 per 10000. So, number of new cases is very low, that's why I had included all cases of leprosy presented to my department for this study, which was fulfilling the inclusion criteria within study duration. Hence the study sample is 70.

Results: The age of the cases included in study ranged from 5 years to 70 years (mean age 34.42 ± 16.02 years). The majority of the cases 32 (36%) were in the age group of 20-40 years (3rd and 4th decade). There were 50(70.4%) males and 21(29.6%) females with a male to female ratio of 2.4: 1.The present study showed the duration of disease ranging 1 to 72 months (mean 9.84 months). Majority of patients (63.8%) presented within 6 months of onset of disease. In this study, most common observed lesion were macule consisting 50 in number, followed by plaque (n=39). 8 cases presented with papule whereas 4patients had nodule.In our study clinical diagnosis of TT and BTH leprosy were found to be common in 20-40 years of age group accounted for 54.5% of total TT cases and 37.83%of total BTH cases respectively. All cases of clinically diagnosed BB cases were seen in 20-40 year of age group. Whereas cases of lepromatous pole of leprosy distributed equally in each age groups of, 20 to 40 yrs, 40 to 60 yrs, > 60 yrs. In this study, upper limb was found to be most common site 46 (64.8%), followed by trunk in 29 (40.8%) patients. 27(38%) cases had lesions over face and 23(32.4%) had lower limb. Most common nerve involved was ulnar nerve which was palpable in total 51 patients, among them 28 were unilateral whereas 23 cases with bilateralinvolvement. Out of 71 cases studied, most commonly observed type of leprosy was BTH presented in 52.1% of cases, followed by TT in 31%. Patient with Lepromatous pole were 9 in number accounted 12.7% of total. Rest 4.2% of cases were of BB. On histopathology, majority of patient observed were BTH contributing 60.6% of total, followed by lepromatous pole 16.9%. 11.3% of patients were found to be indeterminate type of leprosy, whereas 8.5% of patients in BB. Rest 2.8% patients were of TT. TT showed only 4.55**%** of cases positively correlate with clinical diagnosis. BB showed **33.3%** of cases positively correlate with clinical diagnosis. BTH showed **75.7%** of cases positively correlate with clinical diagnosis. Lepromatous pole showed highest correlation 88.9%.

Limitations of the study were histopathological response during treatment course couldn't be assessed as it was a cross sectional study and sample size was less.

Conclusion: Most common clinical and histopathological diagnosis was observed as borderline tuberculoid Hansen. Most common age group was 20-40 years (3rd and 4th decade). Most patients came to seek health care within 6 months of period. Overall agreement in between clinical and histopathological diagnosis was found to be 53.52%. For treatment purpose parity to be found was 89.83% in paucibacillary and 100% for multibacillary.

Keywords: Hansen disease; Histopathology; Leprosy; Spectrum of leprosy; Mycobacterial disease

INTRODUCTION

Hansen's disease, is a chronic, infectious disease that primarily affects the skin and the peripheral nerves[1]. Leprosy expresses itself in different clinico-pathological forms depending on the immune status of the host; diagnosis of leprosy is based on different clinical parameters which involves detailed examination of skin lesions and peripheral nerves. Demonstration of acid –fast bacilli in slit skin smears by Ziehl- Neelsen's staining also aids in diagnosis of

leprosy[2]. A reliable diagnosis hinges around a good histopathological diagnosis and demonstration of bacilli in histopathological sections. Clinical classification gives recognition only to gross appearances of the lesions, while the parameters used for the histopathological classification are well defined, precise and also take into account the immunological manifestations which enable it to successfully bridge the pitfalls in leprosy diagnosis. Histopathology provides confirmatory information for suspect cases which can be missed in clinical practice or epidemiological studies and helps in exact typing. Histology also gives indication of progression and regression of disease under treatment. Ridley and Jopling were the first to suggest a subdivision of leprosy on an immunological basis into five types; tuberculoid (TT), borderline tuberculoid (BT), midborderline (BB), borderline lepromatous (BL) & lepromatous (LL)(3). Later they further developed this idea and correlated clinical and bacteriological findings in each group with respective immunological and histological findings. Classification of leprosy is essential primarily for the purpose of communication at different levels and can be adjudged as satisfactory only if it can be applied without much difficulty by different groups of workers i.e. clinicians, pathologists or immunologists.

For treatment purpose leprosy is divided into paucibacillary and multibacillary. This division is based on clinical examination, like total number of lesions. But many times histology shows different spectrum. For example; if one patient has only 2-3 lesions and this knowledge, we are giving him paucibacillary treatment. But on histopathologically we found multiple foamy macrophages studded with lepra bacilli, so clinical diagnosis sometimes leads to under treatment of patient. Lepra reactions are more common in lepromatous group of patients. So, if we positively correlate histopathologically, we can predict future reaction. The present study will be carried out to assess the concordance between clinical and histopathological diagnosis in cases of leprosy using Ridley-Jopling scale.

The aim of the study is to observe the patient of various spectrum of leprosy and correlate clinical findings with histopathological findings.

MATERIALS AND METHODOLOGY

It is a Cross sectional observational study conducted in Dept. of Dermatology, from central west India, from April 2015 to September 2016. Person with sign and symptoms of leprosy, cases with hypopigmented lesions with definitive sensory impairment, cases with erythematous papule, plaque and nodule with sensory impairment. Person with no known history of prior leprosy treatment, and willingness to do biopsy and signing the informed consent form were included. Subjects with no skin lesions, only sensory loss or thickened nerve, not giving consent for biopsy, history of prior treatment with MDT regime complete or incomplete and patient with lepra reactions were excluded.

Patients fulfilling criteria complete history was taken from each patient including age, gender, occupation, duration of disease, familial history, history of similar complaint in neighborhood, previous treatment history, presence of symptoms suggestive of reactions, and the presence of concurrent disease, other skin diseases, allergic diseases, systemic problems. Biopsy was done after clinical examination of patients. Repeat biopsy was done if first one was not conclusive. Haematoxylin and Eosin stained sections of skin biopsies of all the cases of leprosy were examined

for epidermal atrophy, epithelioid granulomas, distribution of lymphocytes, histiocytes & foam cell, infiltration of nerves, blood vessels and adnexa, and grenz zone

Photographic documentation of subjects in sitting or standing in upright posture were taken [camera model – canon Power shot SX40HS, camera mode - ―A‖ mode for aperture setting, ISO value 1600, Aperture 3.5, No flash light]. Skin biopsies were carried with 4mmx4mm punch after infiltrating the area with 2% xylocaine. The specimen was fixed in 10% formalin. Following fixation for 12-24 hours, the tissues were processed and embedded in paraffin and serial sections of 4-5 microns thickness were obtained. Egg albumin was used to fix sections on a glass slide and later stained with Haematoxylin & Eosin for histopathological evaluation, and with Modified Fite-Faraco to see the bacilli.

Results were interpreted in these points were used to classify the histopathology slides. Diagnosis was made on considering all features observed and presence of most common features (Table 1).

Histopathological diagnosis	Features
Indeterminate	Mild perivascular and peri adnexal lymphocytic infiltrate, occasional perineural infiltrate
TT	Epithelioid cells ++, giant cells +/-, histiocytes/foamy macrophages -,lymphocytes ++±/+,clear sub epidermal zone -, erosion of epidermis (+), acid-fast bacilli in granuloma (BI)0/1
BTH	Epithelioid cells ++, giant cells ++/-, histiocytes/foamy macrophages -, lymphocytes ++±/+,clear subepidermal zone ±, erosion of epidermis - , acid-fast bacilli in granuloma (BI)0/2
BB	Epithelioid cells ++, giant cells -,histiocytes/foamy macrophages +, lymphocytes ±,clear subepidermal zone ±, erosion of epidermis -, acid-fast bacilli in granuloma (BI)3/4
BLH	Epithelioid cells ±, giant cells -, histiocytes/foamy macrophages ++, lymphocytes ++,clear subepidermal zone +, erosion of epidermis -, acid-fast bacilli in granuloma (BI)4/5
LL	Epithelioid cells -, giant cells -, histiocytes/foamy macrophages ++, lymphocytes +,clear subepidermal zone +, erosion of epidermis -, acid-fast bacilli in granuloma (BI)5/6

Sample size calculation and statistics: Prevalence of Leprosy in 2014 at Maharashtra was 0.9 per 10000. So, number of new cases is very low, that's why I had included all cases of leprosy presented to my department for this study, which was fulfilling the inclusion criteria within study duration. Hence the study sample is 70. Microsoft Excel and SPSS 23 software packages were used for data entry and Analysis. The results were averaged for each parameter for continuous data and numbers and percentage for categorical data presented in Table and Figures. To

determine clinico- histopathological correlation of skin biopsies in leprosy, statistical evaluation SPSS version 23 was used. Chi square test and Fishers exact test was used for statistical significance and p value <0.05 will be considered significant.

RESULTS

The age of the cases included in study ranged from 5 years to 70 years (mean age 34.42 ± 16.02 years). The majority of the cases 32 (36%) were in the age group of 20-40 years (3rd and 4th decade). A total of 16 (22.5%) were children and adolescence. There were 50(70.4%) males and 21(29.6%) females with a male to female ratio of 2.4: 1. The total numbers of patients were divided into 4 groups according to the duration of disease. The present study shows the duration of disease ranging 1 to 72 months (mean 9.84 months). Majority of patients (63.8%) presented within 6 months of onset of disease. 49(84.5.0%) patients presented within 1 year (12 months)of duration. Rest 9(15.5%) had duration more than 12 months to 72 months. In this study, most common observed lesion are macule consisting 50 in number, followed by plaque (n=39). 8 cases presented with papule whereas 4 patients had nodule.

In this study, upper limb was found to be most common site 46 (64.8%), followed by trunk in 29 (40.8%) patients. 27(38%) cases had lesions over face and 23(32.4%) had lower limb. In this study most common nerve involved was ulnar nerve which was palpable in total 51 patients, among them 28 were unilateral whereas 23 cases with bilateral involvement. Radial cutaneous nerve was palpable in total 20 patients, among them 13 were unilateral whereas 7 cases with bilateral involvement. Radial nerve was palpable in total 14 patients, among them 12 were unilateral whereas 2 cases with bilateral involvement. Out of 71 cases studied, most observed type of leprosy was BTH presented in 52.1% of cases, followed by TT in 31%. Patient with Lepromatous pole were 9 in number accounted 12.7% of total. Rest 4.2% of cases were of BB.In this study, majority of patient observed were BTH contributing 60.6% of total, followed by lepromatous pole 16.9%. 11.3% of patients were found to be Indeterminate type of leprosy, whereas 8.5% of patients in BB. Rest 2.8% patients were of TT.

In this study out of clinically diagnosed 22 cases of TT, 15(68.2%) were found to be of BTH histopathologically. 4(18.2%) cases were of Indeterminate, 2(9.1%) cases were of BB, and only 1(4.5%) was in TT. Out of 37 clinically diagnosed BTH cases, 28(75.7%) had BTH histopathology. 4(10.8%) cases were of Indeterminate, 2(5.4%) cases were of BB, and only 1(2.7%) was in TT. Among 3 clinically diagnosed cases of BB (Mid borderline), 2(66.7%) were found of Lepromatous pole (BL, LL). Whereas 1(33.3%) to be in BB. Out of 9 cases of clinically diagnosed lepromatous pole of leprosy 8 (88.9%) were also found to be in the same pole histologically, whereas 1 (11.1%) patient was diagnosed as BB.

Table 2: Clinical and histopathological correlation

Clinical diagnosis		**Histopathological diagnosis**					Total
		Indeterminate	**TT**	**BTH**	**BB**	**BLH +LL+ HISTOID**	
TT	Count	4	1	15	2	0	22
	% within Clinidiagnosis	18.2%	4.5%	68.2%	9.1%	.0%	100.0%
	% within HistoPathodiagno	50.0%	50.0%	34.9%	33.3%	.0%	31.0%
BT	Count	4	1	28	2	2	37
	% within Clinidiagnosis	10.8%	2.7%	75.7%	5.4%	5.4%	100.0%
	% within HistoPathodiagno	50.0%	50.0%	65.1%	33.3%	16.7%	52.1%
BB	Count	0	0	0	1	2	3
	% within Clinidiagnosis	.0%	.0%	.0%	33.3%	66.7%	100.0%
	% within HistoPathodiagno	.0%	.0%	.0%	16.7%	16.7%	4.2%
BL+LL+ histoid	Count	0	0	0	1	8	9
	% within Clinidiagnosis	.0%	.0%	.0%	11.1%	88.9%	100.0%
	% within HistoPathodiagno	.0%	.0%	.0%	16.7%	66.7%	12.7%
Total	Count	8	2	43	6	12	71

	% within Clinidiagnosis	11.3%	2.8%	60.6%	8.5%	16.9%	100.0%
	% within HistoPathodiagno	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In our study clinical diagnosis of TT and BTH leprosy were found to be common in 20-40 years of age group accounted for 54.5% of total TT cases and 37.83% of total BTH cases respectively. All cases of clinically diagnosed BB cases were seen in 20-40 year of age group. Whereas cases of lepromatous pole of leprosy distributed equally in each age groups of, 20 to 40 yrs, 40 to 60 yrs, > 60 yrs. In this study, various histopathological features were noted.

Atrophic skin was present in 33 patients of BTH, 16 patients of TT, 3 patients of BB and 9 patients of lepromatous pole of leprosy. Giant cells were present in 17 patients of BTH, 7 patients of TT, while absent in patients of BB & lepromatous pole of leprosy. Grenz zone seen in 9 patients of lepromatous pole of leprosy, 3 patients of TT, 2 patients of BB, and 1 patients of BTH. Foamy cells present in all cases of lepromatous pole, 2 (9.1%) cases of TT, 3 (8.1%) cases of BTH and 1 (33.3%) case of BB. Epitheloid cells was present in 18(81%) cases of TT, 33(89.%) of BTH, 3(100%) cases of BB, whereas no such cells were seen in lepromatous pole.

Table 3: Association of clinical diagnosis with histopathological features

Clinical diagnosis		**Histopathological features**					
		Atrophic skin	**Giant cells**	**Histiocytes**	**Epitheloid cells**	**Grenz zone**	**Foamy cells**
TT	Count	16	7	8	18	3	2
	% within Clinidiagnosis	72.7%	31.8%	36.4%	81.8%	13.6%	9.1%
BT	Count	33	17	15	33	1	3
	% within Clinidiagnosis	89.2%	45.9%	40.5%	89.2%	2.7%	8.1%
BB	Count	3	0	3	3	2	1

	% within Clinidiagnosis	100.0%	.0%	100.0%	100.0%	66.7%	33.3%
BL +LL+ histoid	Count	9	0	9	0	9	9
	% within Clinidiagnosis	100.0%	.0%	100.0%	.0%	100.0%	100.0%
Total	Count	61	24	35	54	15	15
	% within Clinidiagnosis	85.9%	33.8%	49.3%	76.1%	21.1%	21.1%

Association of clinical diagnosis with lepra bacilli in Fite-Faraco stain: In this study using fite-faraco staining bacilli were graded as 1+, 2+, 3+, 4+, 5+, 6+. In clinically diagnosed TT, 1 case showed 4+ bacilli in granuloma. In clinically diagnosed BTH, 1 case showed 1+ and 1 case showed 2+ bacilli in granuloma. In BB similarly 1 case showed 1+ and 1 case showed 2+ bacilli in granuloma. In lepromatous pole all cases showed bacilli in granuloma 1+ in 1, 2+ in 3, 3+ in 3 and 4+ in 2.

Association of clinical diagnosis with predominant type of granulomas: In this study, granulomas were categorised as macrophage predominant, epitheloid predominant, lymphocytic predominant and mixed type with lymphoepitheloid cells predominant. Out of 71 patients, 63 cases showed granulomatous infiltrate. 8 cases were of indeterminate leprosy with no granulomatous infiltrate. Among clinically diagnosed TT Hansen 18 were found to be leprosy histopathologically, lympho- epitheloid mixed granuloma were seen in 10(55.6%) cases, 5(27.8%) cases with epitheloid cell granuloma and 3(16.7%) cases of lymphocytic granuloma. Among clinically diagnosed TT Hansen 33 were found to be leprosy histopathologically, lympho-epitheloid mixed granuloma were seen in 21(63.6%) cases, 6(18.2%) cases with epitheloid cell granuloma and 6(18.2%) cases of lymphocytic granuloma.

Among clinically diagnosed BB Hansen Lympho-epitheloid mixed granuloma were seen in 1(33.3%) cases and 2 were of macrophage predominant granuloma.In lepromatous pole 3(33.3%) was of lymphocytic predominance and 6(66.6%) were of macrophage predominant granuloma.

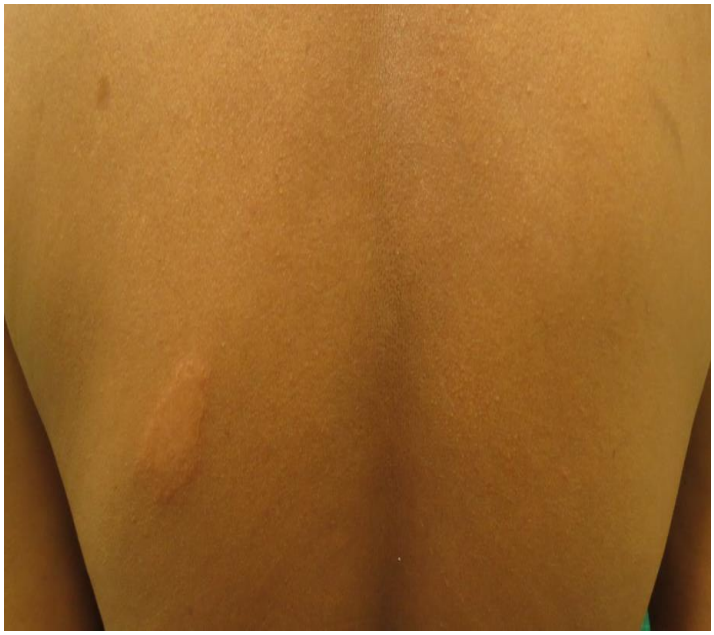

Figure 1: Single raised Plaque, TT leprosy

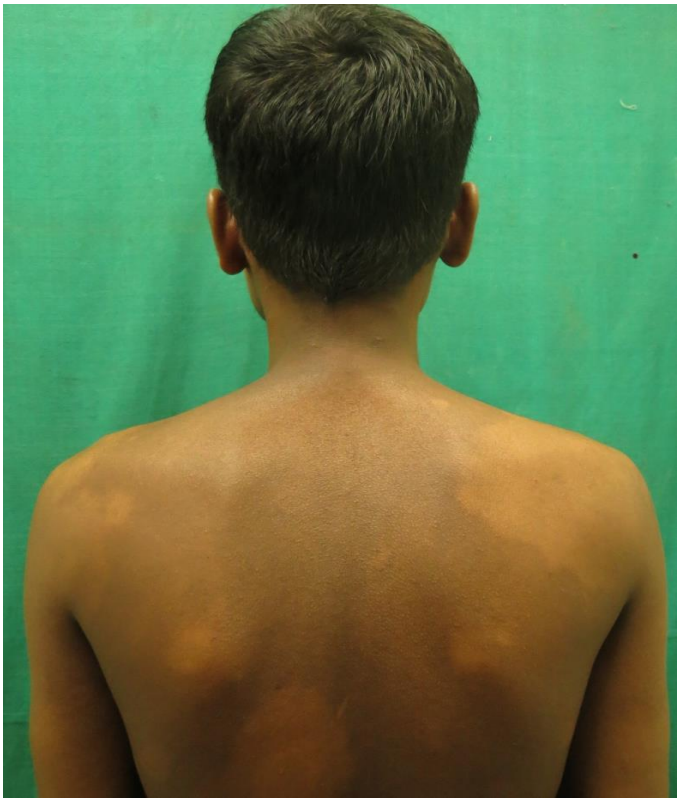

Figure 2: Multiple large hypopigmented patches, BLH

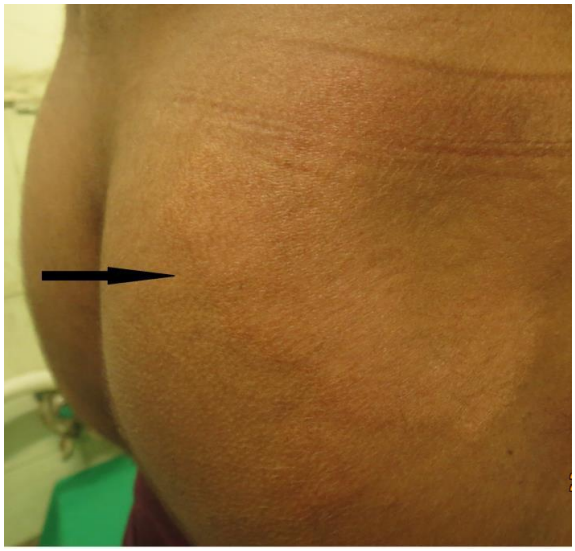

Figure 3: Single large plaque with satellite plaque, BTH

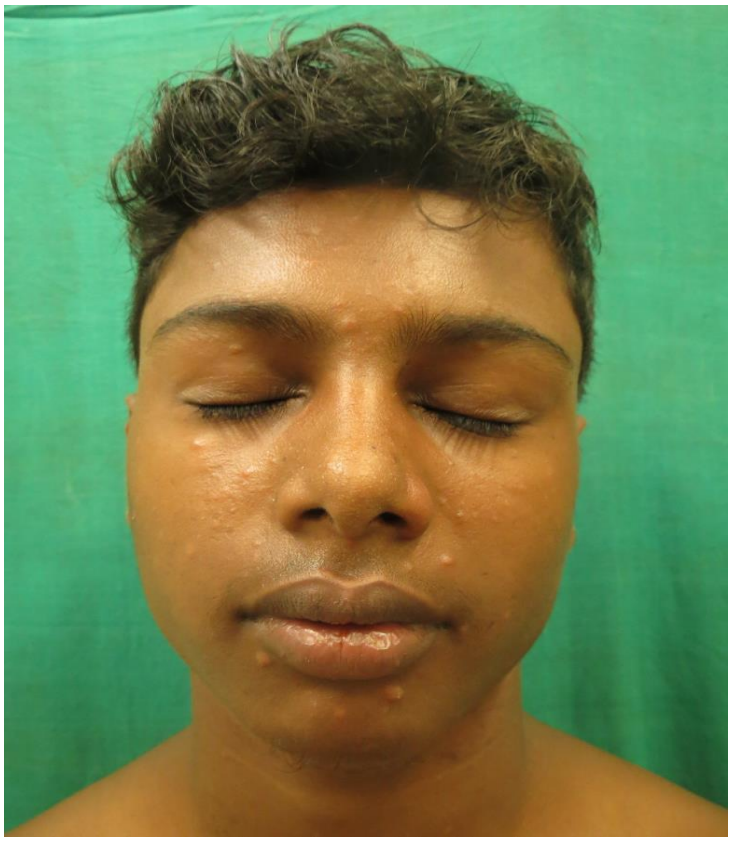

Figure 4: Multiple shiny papules over face, Histoid leprosy

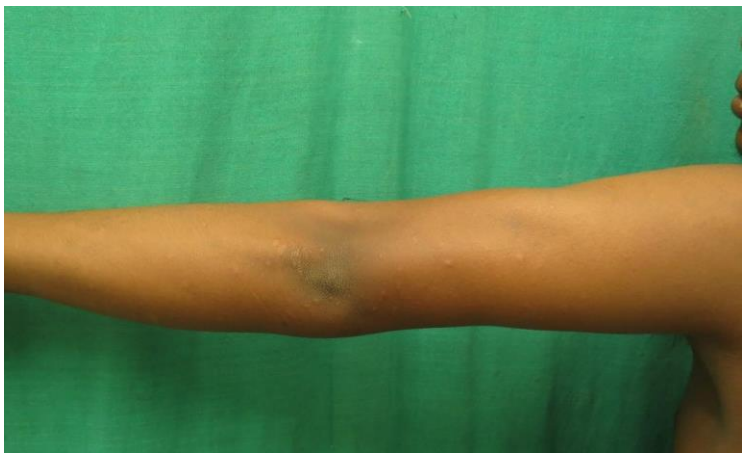

Figure 5: Multiple shiny papules over upper limb, Histoid leprosy (above case)

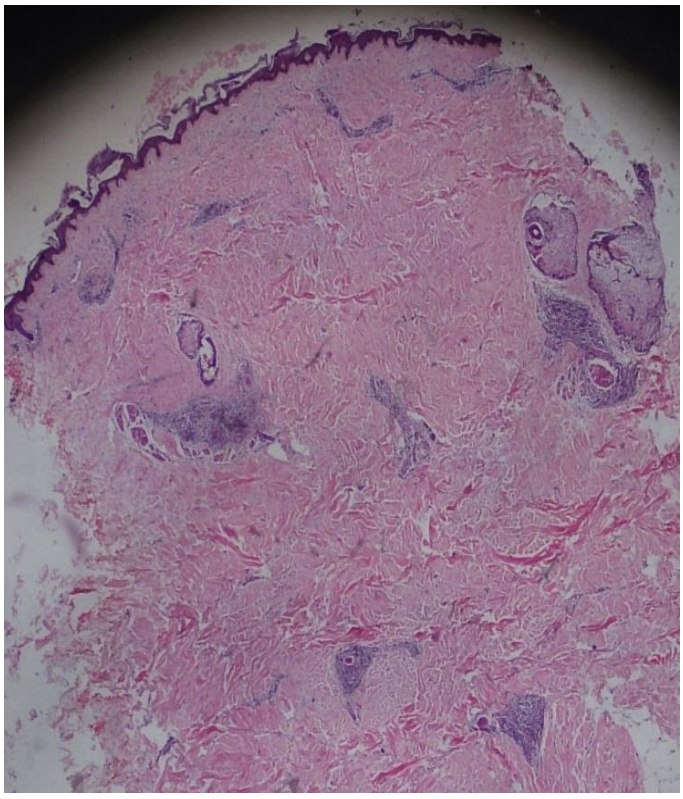

Figure 6: Multiple well defined granuloma, BTH

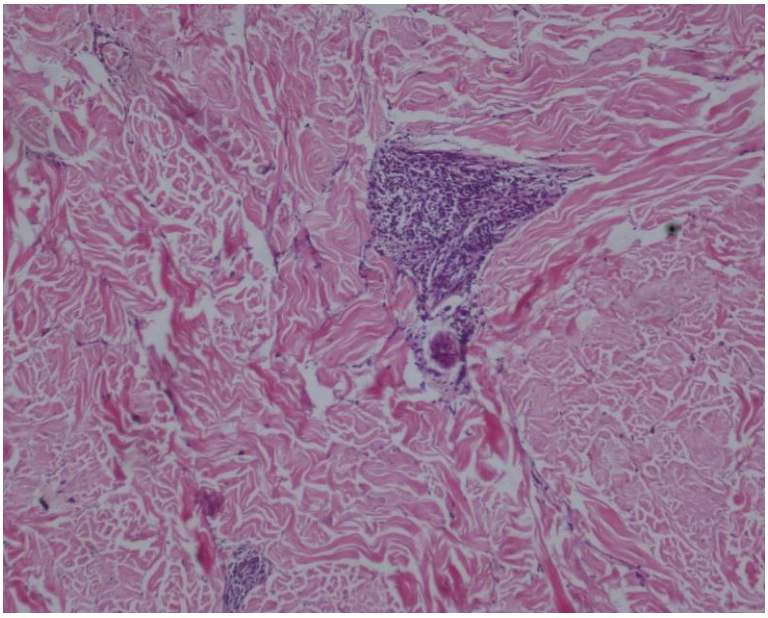

Figure 7: Granuloma with lymphocyte and epitheloid cells, BTH (above case)

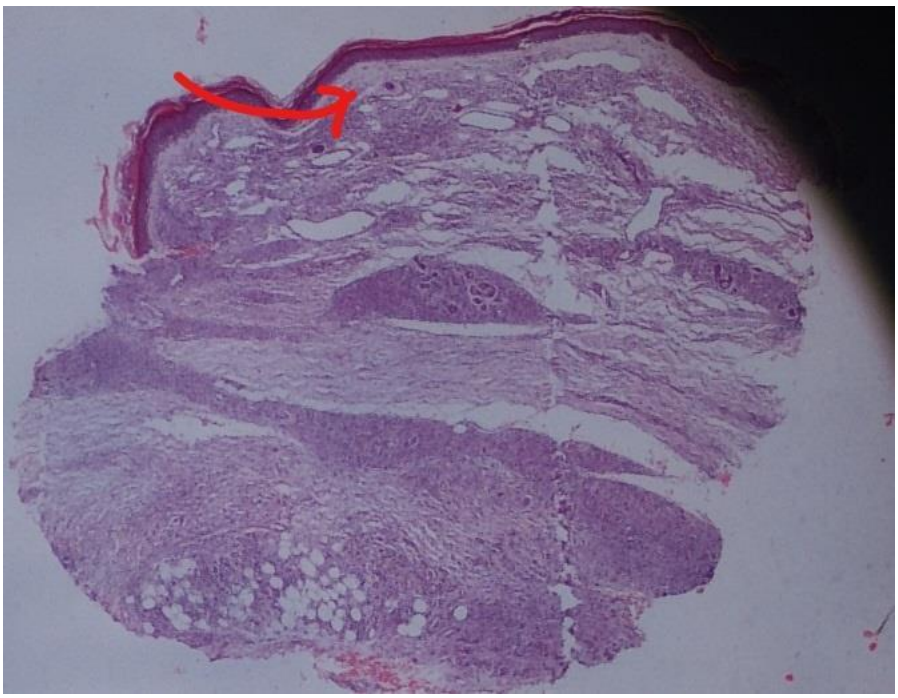

Figure 8: Grenz zone with diffuse granuloma in whole dermis, LL

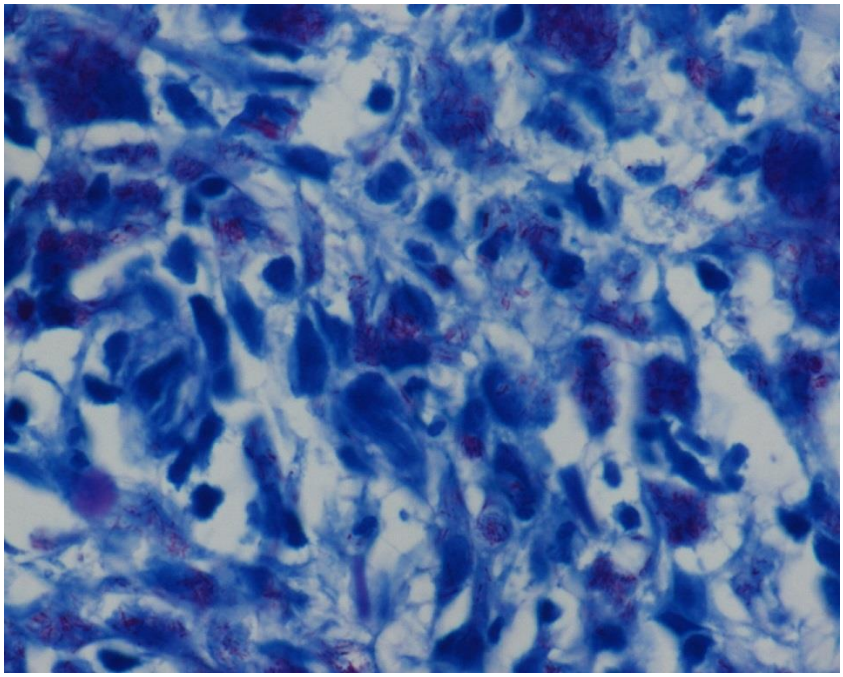

Figure 9: clusters of bacilli in fite faraco

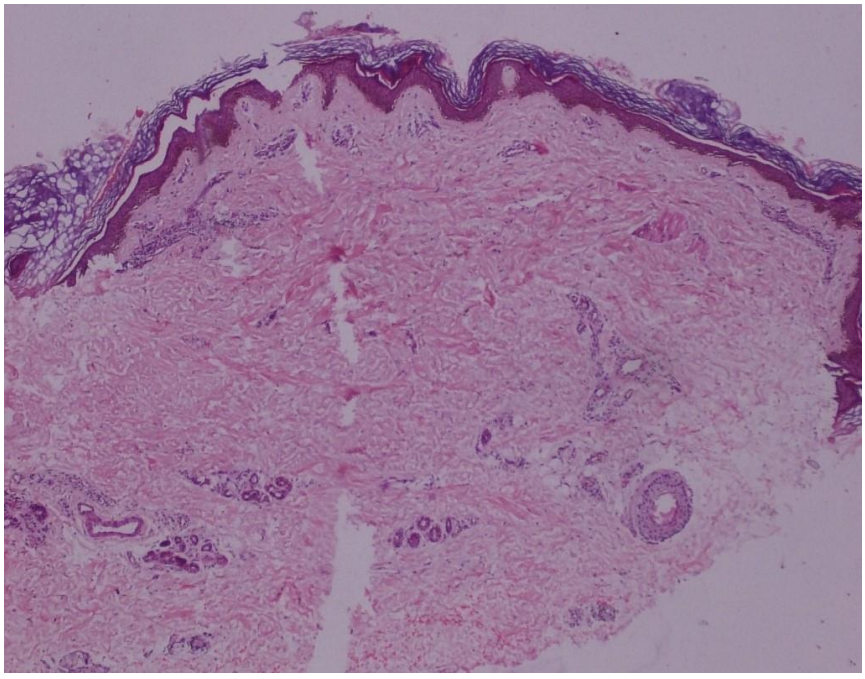

Figure 10: few areas of perivascular and periappendageal infiltrate, Indeterminate leprosy

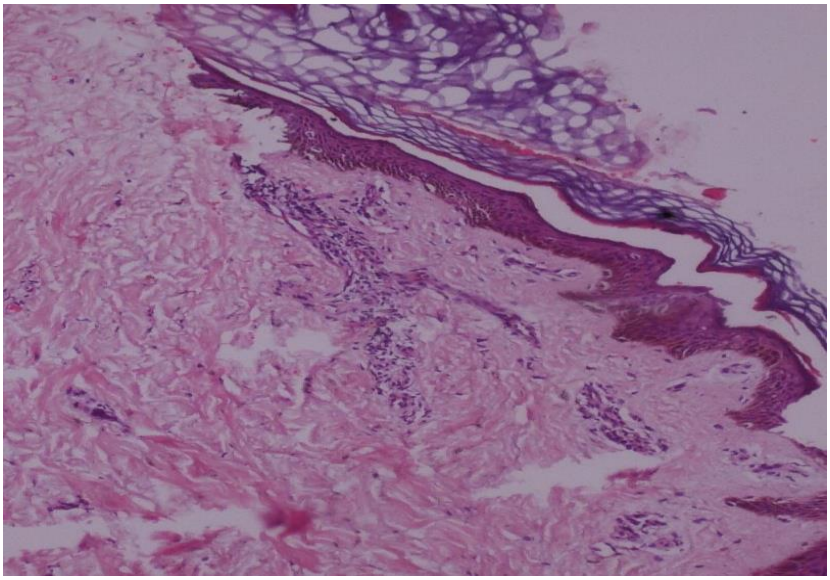

Figure 11: Perivascular infiltrate of lymphocytes, Indeterminate leprosy

DISCUSSION

Leprosy's hallmark is a broad clinical spectrum of pathology, determined by the host immune response. Tuberculoid patients mount a vigorous cell-mediated immune response in skin and nerves, displaying delayed-type hypersensitivity response to M. leprae antigens. Although limiting the number of bacilli and lesions, this strong response accounts for the prominent impairment of peripheral nerves. Conversely, lepromatous patient cellular immunity is unresponsive to M. leprae antigens, associated with high mycobacterial loads in the skin and nerves. However, most leprosy patients have pathology between these two polar forms and are classified as either borderline tuberculoid (BT) or borderline lepromatous (BL). Leprosy reactions are common in these immunologically unstable borderline groups, involving up-regulation of the host response to M. leprae antigens[4].

In this study age of the cases included ranged from 5 years to 70 years (mean age 34.42 ± 16.02 years). The majority of the cases 32 (36%) were in the age group of 20-40 years (3rd and 4th decade). A total of 16 (22.5%) were children and adolescence. In a study by *Thapa et al*[5] youngest patient was 12 years old and oldest was 80 years at presentation; however mean age of patients at presentation was 37.85 +/- 2.021 years. In a study by *J. Bommakanti et al*[6], the common age group affected is between 30-40 yrs, youngest being 9 years & eldest patient reported is 65 years. The majority of patients in a study by *Mathur et al*[7], 33 (23.57%) were in the age group of 21-30 years and least affected was children below 10 years, 1(0.007%). Similarly study conducted by Sehgal et al [8] and Kaur I et al [9] also found majority of the cases in 21- 40 years age group (3rd and 4th decade) 52.3% and 48% respectively and least number of cases in less than 10 years age group (1st decade) 0.96%and 0.2% respectively. Hence according to

the studies it is observed that most cases of leprosy are in middle age group, this coincides with highest Indian population belongs with this age group.

In this study there were 50(70.4%) males and 21(29.6%) females with a male to female ratio of 2.4: 1. The number of male and female patients in this study by by J. Bommakanti [6] were 55 (73.3%) and 20 (26.7%)respectively of the total 75 cases. Male to female ratio being 2.75:1. The predominance of males over female was similar to the observation made by Cochrane and Davey et al 1964. The age of the patients in a study by A Kumar, SR Negi [10] ranges from 6 years to 90 years with mean of 40.1 years with male to female ratio (M: F) of 2.38 in favour of males. This indicates higher chances of a male to get leprosy than females. But the main factors causing the sex difference is the opportunity for contact.

In this study, most common observed lesion are macule consisting 50 in number, followed by plaque (n=39). 8 cases presented with papule whereas 4 patients had nodule. Study done by M. Tiwari el al [11] most common lesions were hypopigmented macules (68%) followed by plaques (26%) and nodule (6%). Similarly study done by M Giridhar et al [12] leprosy more commonly presented with hypopigmented patch with 68 (69.4%) cases than as erythematous plaques with 30 (30.6%) cases. In this study, upper limb was found to be most common site 46 (64.8%), followed by trunk in 29 (40.8%) patients. 27(38%) cases had lesions over face and 23(32.4%) had lower limb. In study done by J. Bommakanti et al (6) , commonly involved site is trunk in 23 (30.7%) and forearms in 21 (28%) patients. Similarly study done by M Giridhar et al [12] who showed most common site chosen for biopsy was upper limb in 39.80% cases (arm 16.33%, forearm 17.35%, hand 5.10% and finger 1.02%) followed by 28.57% cases from back and 22.45% from lower limb. In this study most common nerve involved was ulnar nerve which was palpable in total 51 patients, among them 28 were unilateral whereas 23 cases with bilateral involvement. Radial cutaneous nerve was palpable in total 20 patients, among them 13 were unilateral whereas 7 cases with bilateral involvement. In study by J. Bommakanti [13] they found peripheral nerves enlarged are mainly Ulnar nerve & lateral popliteal nerve.

Out of 71 cases studied, most observed type of leprosy was BTH presented in 52.1% of cases, followed by TT in 31%. Patient with Lepromatous pole were 9 in number accounted 12.7% of total. Rest 4.2% of cases were of BB. In a study by Giridhar et al[12] Clinically, BT was the most common type of Leprosy with 44% cases followed by TT 18% cases, LL 17%, BL 14%, IL 5% and least common type of leprosy seen clinically was BB with 2% cases. In a study by Anusha et al(14) BT was the most common type of leprosy with 28.6% [14] followed by TT in 26.5%[13], IDL in 14.3 %[7], BB in 12.2%(6), LL in 10.2% [5]and BL in 8.2% [4]. Study by A. Sharma et al[15] distribution of 247 cases on the clinical leprosy spectrum based on Ridley-Jopling scale they found maximum cases (74.09%) in borderline group (BT+BB+BL). In polar groups, 19 (7.69%) cases belonged to TT, 29 (11.74%) to LL and Least number (6.48%) was in Indeterminate. Values are in this study are different from above illustrated studied. Reason may be change in inclusion criteria and difference in place of study.

Histopathological diagnosis observed in this study, majority of patient observed were BTH contributing 60.6% of total, followed by lepromatous pole 16.9%. 11.3% of patients were found to be Indeterminate type of leprosy, whereas 8.5% of patients in BB. Rest 2.8% patients were of TT. In a study by *Thapa et al* [5] Borderline Tuberculoid (BT) and TT was the most common diagnosis among leprosy patients around 29.2% each, followed by Indeterminate 25%, LL 8.3%, BL and and Pure neural 4.1% each. Study by A *Sharma et al* [15] found maximum cases in BT 87 (32.22%), followed by BB 45 (16.67%), LL 25 (9.26%), TT (20 7.41%) and least in BL 16 (5.93%). 54 (20%) cases were belongs to Indeterminate type. In study by *Anusha et al* [14] Histopathologically, majority of the cases i.e., 36.7% belonged to BT followed by TT in 24.5%, BB in 10.2%, IDL in 10.2% and LL in 10.2% patients each and BL being 8.2 %.

Table 4: Correlation of clinical and Histopathological diagnosis**:** The correlation in different spectrum of Ridley-Jopling classification(3) and comparison with other studies is as follows...

Clinical	**Histopathological Diagnosis**					**Agreement**
	Paucibacillary			Multibacillary		
	Indeterminate	TT	BTH	BB	BLH+LL+HISTOID	
TT (n=22)	4	1	15	2	0	1 (4.5%)
BTH (n=37)	4	1	28	2	2	28 (75.7%)
BB (n=3)	0	0	0	1	2	1 (33.3%)
BLH+LL+ HISTOID(n=9)	0	0	0	1	8	8 (88.9%)

Tuberculoid leprosy (TT): Out of 22 clinically diagnosed TT cases 4 was found to Indeterminate, 15 was BTH, 2 was in BB and only 1 was found to be TT. This means only 4.55% of cases positively correlate with clinical diagnosis. In a study by A Sharma et al [15] 9/19 (47.37%) of TT correlated positively. Similar study by Moorthy BN et al [13], they found 46.15% of positive correlation in TT. Possible reason for such difference in our study from other may be due to the that "histological changes are known to precede the clinical manifestations by at least few months". [16] Most of patients presented to our department are from within 5 kilometre range. They have easy access to hospital facility, that's why they presented as TT leprosy clinically but found to be higher spectrum in histopathology i.e. BTH or BB.

Borderline tuberculoid(BTH): Out of 37 clinically diagnosed BTH cases, 28(75.7%) had BTH histopathology. 4(10.8%) cases were of Indeterminate, 2(5.4%) cases were of BB, and only 1(2.7%) was in TT. This means **75.7%**

of cases positively correlate with clinical diagnosis.In a study by M Tiwari et al[11] BTH showed 15/22 (68.18%) of positive correlation. Similarly study by Mathur et al[13] BTH (89.74%) of positive correlation. Similarly study by R Parakh et al[17] BTH (84.6%) of positive correlation.

Mid borderline (BB): Among 3 clinically diagnosed cases of BB (Midborderline), 2(66.7%) were found of Lepromatous pole (BL, LL). Whereas 1(33.3%) to be in BB. This means 33.3% of cases positively correlate with clinical diagnosis.Study done by Bhatia et al [18] concordance between the clinical and histopathological diagnoses in BB was 26%.This type is unstable form of disease and most uncommon in clinical presentation. That's why little parity seen on clinic –histopathological correlation.

Leproamatous pole (BLH, LL and Histoid): Out of 9 cases of clinically diagnosed lepromatous pole of leprosy 8 (88.9%) were also found to be in the same pole histologically, whereas 1 (11.1%) patient was diagnosed as BB. This means 88.9% of cases positively correlate with clinical diagnosis.Study done by Bhatia et al[18] concordance for the BL/LL group it was 93%. M tiwari et al[11] showed 90.9% of concordance for the BL/LL group. Limitations of the study were histopathological response during treatment course couldn't be assessed as it was a cross sectional study and sample size was less.

CONCLUSION

Most common clinical and histopathological diagnosis was observed as borderline tuberculoid Hansen. Most common age group was 20-40 years (3rd and 4th decade). Most patients came to seek health care within 6 months of period. Overall agreement in between clinical and histopathological diagnosis was found to be 53.52%. For treatment purpose parity to be found was 89.83% in paucibacillary and 100% for multibacillary.

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