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ORIGINAL RESEARCH

A Prospective Study of Clinicohistopathological Correlation in Variants of Leprosy at Tertiary Care Centre

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ABSTRACT

Background: Leprosy also known as Hansen's disease, still continues to be an important public health problem. This entity expresses a wide array of clinical and pathological manifestations depending on the immune response of the patient. Clinico-histopathological examination and their correlation in different spectrum of disease assumes a pivotal role in early diagnosis and better management of the patient. **Objectives:** To study the clinico-histopathological correlation in various types of leprosy and confirm clinically proven leprosy patients by histopathological examination.

Material and Methods: The study was conducted at the Department of Pathology, Gajra Raja Medical College and J.A group of hospitals, Gwalior (M.P) for a period of 18 months from January 2021 to June 2022. Cases of all age groups were included. A total of 50 new cases of leprosy were selected on clinical ground attending dermatology OPD. Then these patients were subjected to skin biopsy. Histopathological diagnosis was done on the basis of Ridley Jopling Classification and then it was correlated with the clinical classification to evaluate the concordance among two.

Results: The present study comprised of 50 patients, of which 38 were males and 12 were females. Majority of the patients were between 21- 40 years of age. Both clinically and histopathologically, Borderline tuberculoid constituted the predominant group 46% and 48% respectively. The overall Clinico-histopathological correlation was seen in 37 cases(74%). Maximum correlation was found in LL followed by BT patients.

Conclusion: Cumulative clinical and histopathological diagnosis help in accurate typing of leprosy, thus facilitating appropriate therapy to prevent complications.

Keywords: Leprosy, Clinico -histopathological correlation, Fite Faraco.

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INTRODUCTION

Leprosy also known as Hansen's disease still continues to be an important public health problem in developing countries. It is caused by mycobacterium leprae and affects the skin, peripheral nervous system, bones, joints, eyes, testes, etc.[1,2] This entity expresses a wide array of clinical and pathological manifestations depending on the immune response of the patient. Clinico-histopathological examination and their correlation in different spectrums of disease assume a pivotal role in early diagnosis and better management of the patient.

Leprosy can be diagnosed by various methods including detailed clinical examination of the skin lesions and peripheral nerves, demonstration of the Acid Fast Bacilli (AFB) in slit skin smears by Ziehl-Nielsen staining, Histopathological section, demonstration of bacilli by modified Fite Faraco procedure.

Histopathological Examination also helps us in understanding the disease, its various manifestations, and complication. Early acute accurate diagnosis is required for the correct and adequate treatment. So clinical-histopathological correlation is extremely important in management.[3]

The prevalence rate of leprosy in 2020- 21 was 0.4 per 10,000 population in the country. Despite Covid 19 disruption of health services during 2020-21, 65,147 new cases of leprosy were identified and diagnosed. In 2020, there were 127558 new leprosy cases detected globally.[4]

Aims and Objectives

1. To study the clinico-histopathological correlation in various types of Hansen's Disease.
2. To confirm clinically proven leprosy patient by histopathological examination.
3. To study the morphological variants of leprosy prevalent among the cases studied.

MATERIAL & METHODS

The Prospective study was conducted at the Department of Pathology, Gajra Raja Medical College and J.A group of hospitals, Gwalior (M.P) for a period of 18 months from January 2021 to June 2022.. A total of 50 new cases of leprosy were selected on the clinical ground attending dermatology OPD after taking their consent. Cases of all age groups were included. In all patients, detailed history and clinical examination were done Then these patients were subjected to skin biopsy. Skin biopsy was taken by the clinician and sent for histopathological study. For Histopathological diagnosis, smears were stained with H& E and Fite Faraco. Diagnosis was done on the basis of Ridley Jopling Classification and then it was correlated with the clinical classification to evaluate the concordance among two.

Inclusion Criteria

Patients who are clinically suspected cases of leprosy willing to participate in the study.

Exclusion Criteria

Patients who are already on MDR drug therapy.

Patients who are clinically suspected but not giving consent.

RESULTS

Table: 1 Age Group Distribution in among study participants

Age	Frequency	Percent
0-20	10	20.0
21-45	28	56.0
>45	12	24.0
Total	50	100.0

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In our study, the maximum number of patients (56%) showing clinical activity in this study belonged to the 21- 40 years age group whereas the least number of patients belonged to the less than 20 years age group.

Table: 2 Sex Distribution in among study participants

Sex	Frequency	Percent
Female	12	24.0
Male	38	76.0
Total	50	100.0

In the present study, male patients comprised 76% and female patients 24 % of the total patients. Male to female ratio was 3.1:1.

Table: 3 Clinical Diagnosis in study participants

Clinical Diagnosis		
	Frequency	Percent
TT	5	10.0
BT	23	46.0
BB	7	14.0
BL	6	12.0
LL	9	18.0
Total	50	100.0

In our study all the patients were thoroughly examined by clinician and diagnosed. Out of 50 cases, 5(10%) were diagnosed as TT, 23(46%) as BT, 7(14%) as BB, 6(12%) as BL, 9(18%) as LL.

Table: 4 Histopathological Diagnosis in study participants

Histopathological Diagnosis		
	Frequency	Percent
TT	5	10.0
BT	24	48.0
BB	5	10.0
BL	6	12.0
LL	10	20.0
Total	50	100.0

In our study skin biopsy was taken from by the clinician and sent for histopathology in our department and stained with H & E stain.

Out of 50 patients, 24(48%) patients were histologically diagnosed as BT, 10(20%) as LL, 6(12%) as BL, 5(10%) as BB, 5(10%) as TT.

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Table: 5 Correlation between clinical and Histopathological diagnosis

			Histopathological Diagnosis					
			TT	**BT**	**BB**	**BL**	**LL**	**Total**
Clinical Diagnosis	TT (5)	**N**	**3**	**2**	**0**	**0**	**0**	**5**
		%	60.00%	40.00%	0.00%	0.00%	0.00%	100.00%
	BT (23)	N	2	19	2	0	0	23
		%	8.70%	82.60%	8.70%	0.00%	0.00%	100.00%
	BB (7)	N	0	3	3	1	0	7
		%	0.00%	42.90%	42.90%	14.30%	0.00%	100.00%
	BL (6)	N	0	0	0	4	2	6
		%	0.00%	0.00%	0.00%	66.70%	33.30%	100.00%
	LL (9)	N	0	0	0	1	8	9
		%	0.00%	0.00%	0.00%	11.10%	88.90%	100.00%
	Total	N	5	24	5	6	10	50
		%	10.00%	48.00%	10.00%	12.00%	20.00%	100.00%

Chisquare: 156.402, df: 25, p= <0.0001

The present study comprised of 50 patients, of which 38 were males and 12 were females. Majority of the patients were between 21- 40 years of age. Both clinically and histopathologically, Borderline tuberculoid constituted the predominant group 46% and 48% respectively. The overall Clinico-histopathological correlation was seen in 37 cases(74%). Maximum correlation was found in LL followed by BT patients.

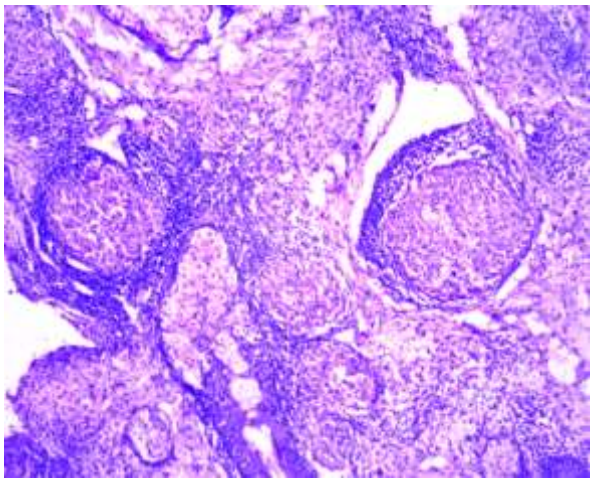

Figure: 1 Tuberculoid Leprosy: Multiple well formed granulomas in the dermis. (H & E) 400x

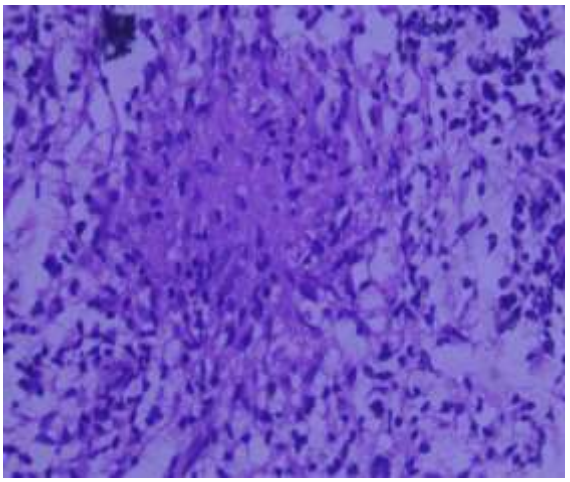

Figure: 2 Tuberculoid Leprosy: shows tubercle composed epithelioid cells and lymphocyte(H & E) 400x

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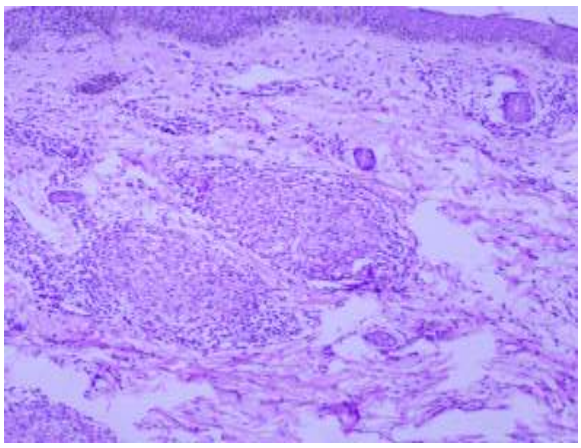

Figure: 3 Tuberculoid Leprosy: shows granuloma with giant cells. (H & E) 100x

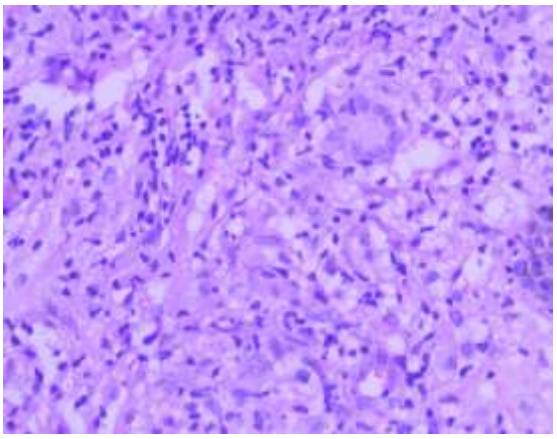

Figure: 4 Borderline Tuberculoid Leprosy shows poorly formed granuloma with giant cells. .(H & E) 400x

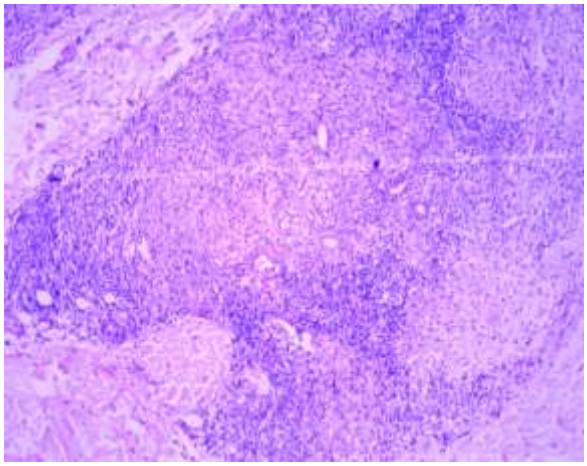

Figure: 5 Borderline Tuberculoid Leprosy shows poorly formed granuloma. (H & E) 100x

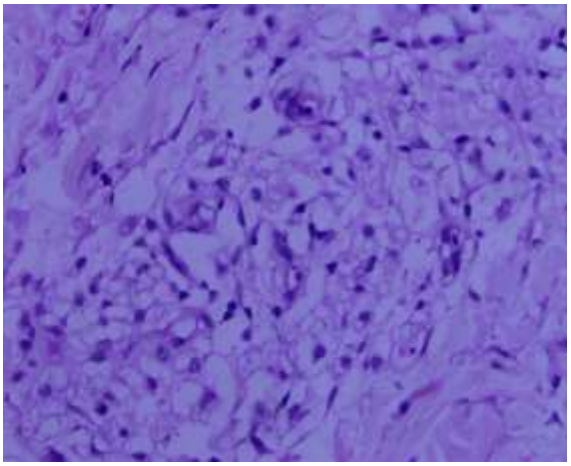

Figure: 6 Borderline Borderline Leprosy shows Intercellular edema.(H & E) 400x

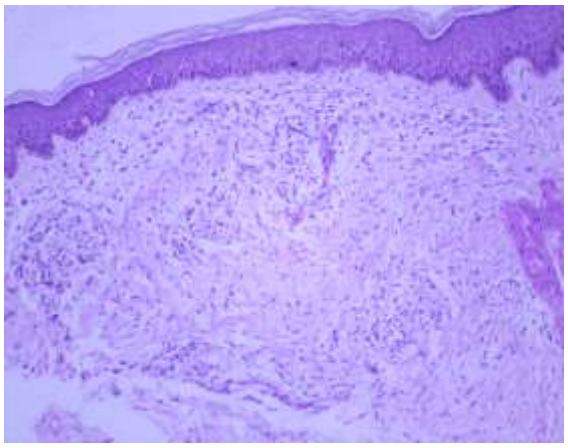

Figure: 7 Borderline Lepromatous Leprosy shows thinning of epidermis and flattening of rete ridges. (H & E) 400x

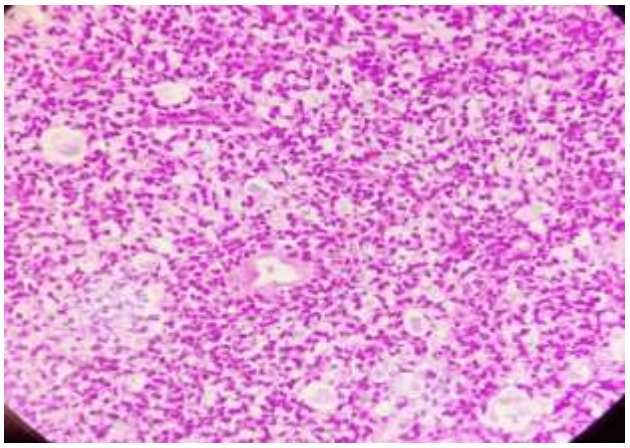

Figure: 8 Lepromatous Leprosy shows collection of foamy macrophages in the dermis. .(H & E) 400x

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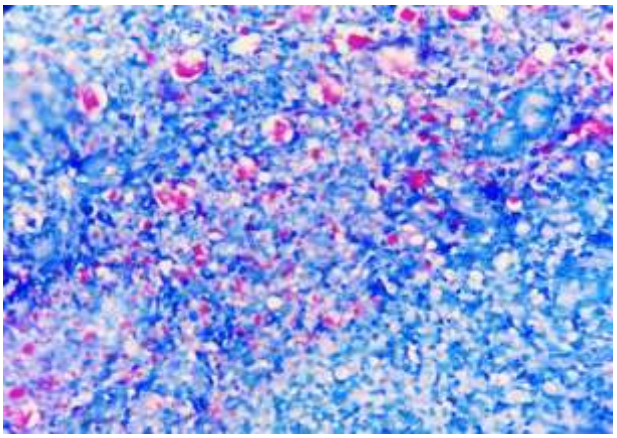

Figure: 9 Lepromatous leprosy show lepra bacilli in globi arrangement (Fite Faraco stain) 400x

DISCUSSION

In the present study, we used the Ridley-Jopling classification to classify leprosy histopathologically in all cases. Indeterminate leprosy was not included in the analysis.

Age distribution

In our study, more patients belong to the age group of 21-40 years (56%).

Almost similar results were seen in the study done by Moorthy BN et al[5], the majority of patients were between 21-30 years (20.70%). Similarly, Sharma S, Rai NN[6], Santaram and Porichha[8] found the majority of patients were between 21-40 years (46.2%). Jindal et al[10] and Samuel et al[11] found the disease in 48% of patients belonging to the age group of 21- 40 years.

Sex distribution

In our study, 76% of patients were males and 24% were females. In a study conducted by Sharma S and Rai NN[6], 65.8% of male and 34.1% of female patients. Santaram and Porichaa [8] found the disease in 80% of males. Singh et al[7] found the disease in 69% of males. Similarly, Moorthy et al[5], Girdhar M et al [9] and Nitesh Mohan et al[12] found the disease to be more common in males.

Clinical diagnosis

In Present study, out of 50 patients, 46% were diagnosed as BT, 18% as LL, 12% as BL, 10% as TT, and 14% as BB. Similarly, Nitesh Mohan et al[12] found BT in 45.26%, LL in 23.68%, BL in 13.68%, TT in 7.89%, and BB in 2.12% of patients. Jindal et 10 found LL in 33%, BT in 28%, BL in 23%, TT in 5.5%, and BB in 4% of patients. Ramanjanayalu[14] and Zhongdong found that the majority of patients had BT.

Histo-pathological distribution

In Present study, 48% of patients were histopathologically diagnosed as BT patients, 20% as LL, 12% as BL, 10% as BB, and 10% as TT.

The study of Nitesh Mohan et al 12 found 44.4% as BT, 19.05% as LL, 14.8% as IL, 12.7% as BL, 7.4% as TT, and 1.6% as BB. Similarly, in Manandhar et al[15], 40% of patients were histopathologically diagnosed as BT.

Fite - Faraco stain

Fite -Faraco stain was positive in 26% of patients and negative in 74% of patients. In the positive patients, 76.9% were belonging to LL and 23.1% were belonging to BL. In a study done by Manandhar et al[15] 25% of patients were positive. Bhushan P et al[13]. found a significant number of positive cases in biopsy which constituted 65 (46.09%) cases.

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Clinico-histopathological correlation

In Present study skin biopsy was received in all 50 patients. The clinico-histopathological agreement was seen in 37 (74%) cases and disagreement in 13 (26%) cases. Out of 5 patients clinically diagnosed as TT, 3(60%) patients had histopathological correlation. Out of 23 patients clinically diagnosed as BT, 19(82.6%) patients had histopathological correlation. Out of 7 patients clinically diagnosed as BB, 3(42.9%) patients had histological correlation. Out of 6 patients clinically diagnosed as BL, 4(66.7%) patients had histopathological correlation. Out of 9 patients clinically diagnosed as LL, 8(88.9%) patients had histopathological correlation. There was complete agreement between the clinical and histopathologic diagnosis in 74% of the cases.

Table: 6 Clinico-Pathological Correlation in Various Spectrum in Various Studies

Type of leprosy	Bhatia et al	Sanya sharma et al	Bhushan et al	Kar et al	Kalla et al	Jerath And Desai	Moorthy Et al	Present study
TT	50	80	100	87.5	75.6	74.5	46.15	60
BT	77	56	83.13	60.9	44.2	64.7	66.54	82.6
BB	26	50	50	54.5	37	28.5	50	42.9
BL	43	86.2	65.22	53.8	43.7	53.8	70	66.7
LL	91	77.4	100	71.4	76.7	61.5	80	88.9
IL	36	68.4	-	81.2	-	88.8	20	-

Many studies observed the highest percentage of clinico-histopathological correlation of lepromatous leprosy and tuberculoid leprosy in their studies and showed the least clinico-histopathological correlation in mid-borderline lepromatous leprosy. In contrast to our study, Nayak SV et al16 study showed a maximum correlation in mid borderline (100%). Ridley and Jopling found complete agreement between clinical and histopathological types in 68.3%.[2]

There was a minor disagreement (disagreement in one group) in 13 (26%) cases and no major disagreement (more than one group). Ridley and Jopling found minor disagreement in 21 patients (25.6%), and major disagreement in 5 patients (6%).

CONCLUSION

Leprosy still continues to be a domestic, national, and global burden and is present in different clinicopathological forms. Many cases are diagnosed clinically; especially in the Lepromatous pole of the disease, however, other types of Leprosy pose a significant problem in clinical diagnosis. Histopathological examination of the lesions is very helpful to confirms the exact subtype of the disease and facilitates the institution of the accurate mode of therapy.

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