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Original Research Article

Clinico-Histopathological Analysis and Bacillary Index in a Study of Skin Biopsies of Leprosy Patients

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ABSTRACT

Introduction: Leprosy is one of the leading causes of physical disabilities contributing to intense social stigmata resulting in human discrimination. This chronic infectious disease caused by Mycobacterium leprae principally affects skin. Histopathology study and bacillary index is important in understanding the disease progression, diagnosis, varied manifestation and complications.

Aim: To study the histopathological features of leprosy in skin biopsies, categorize them into various types and correlate Bacillary Index with clinical presentation whenever possible.

Materials & Methods: Skin biopsy specimen was obtained from clinically diagnosed 100 cases of Leprosy patients attending Skin OPD. Specimen stained with Hematoxylin & Eosin and 5% AFB.

Results: The age of the patients ranged from 4 to 80 years. The male to female ratio was 3:1. Borderline Tuberculoid was the most common presentation. Clinco-histopathological agreement was seen in 76 (76%) cases.

Conclusions: The clinical and histopathological features along with bacteriological index are useful than any single parameter in arriving definitive diagnosis and classification of the leprosy.

Keywords: Leprosy, Histoid, Bacillary Index.

INTRODUCTION

Leprosy is a slowly progressive, chronic granulomatous, infectious disease caused by Mycobacterium leprae, and affecting the skin, peripheral nervous system and certain other tissues. Leprosy is one of the leading causes of physical disabilities contributing to intense social stigmata resulting in human discrimination.[1] Histopathology study and bacillary index is important in understanding the disease progression, diagnosis, varied manifestation and complications.[2] Leprosy can be diagnosed by various methods including detailed clinical examination of the skin lesions and peripheral nerves,[3] histopathological section and demonstration of bacilli by 5% AFB. Ridley and Jopling have suggested immunological basis of leprosy. They classified leprosy into five types as Tuberculoid Leprosy (TT), Borderline Tuberculoid Leprosy (BT), Mid-Borderline Leprosy (BB), Borderline Lepromatous Leprosy (BL), and Lepromatous Leprosy (LL).[2,4-7] This Classification is accepted worldwide and is highly recommended, here is an early stage of the disease, designated as indeterminate leprosy, presenting as vague anesthetic patches, in which only a few inflammatory cells are seen.

Aim: To study the histopathological features of leprosy in skin biopsies, categorize them into various types and correlate Bacillary Index with clinical presentation whenever possible.

MATERIALS AND METHODS

This descriptive analytical study was done on skin biopsies in the Department of Pathology, Narendra Modi Medical College and L. G. Hospital, Ahmedabad, from June 2016 to October 2018. The study sample consisted of 100 skin biopsies from leprosy patients, stained with H & E and 5% AFB stains.

RESULTS

Majority of patients were adult males in the age group of 21 to 30 years. Male to Female ratio was 3:1 (Table-1). The patients presented with hypopigmentation, raised lesions and numbness. Duration of clinical symptoms varied from 2 days to 5 years. Most common clinical type of leprosy was Borderline Tuberculoid leprosy.

Table-1: Age & Gender Distribution

Age (in years)	Frequency (N)	Male	Female
1-10	02	01	1
11-20	16	14	2
21-30	36	23	13
31-40	17	16	1
41 -50	13	10	3
51-60	10	08	2
Above 61	06	03	3
%	100	75	25

Table-2: Clinical & Histopathological correlation

Type of Leprosy	Clinical Diagnosis	Histopathological Diagnosis	Correlation
Tuberculoid Leprosy	04	04	100%
Borderline Tuberculoid	39	30	76.9%
Mid Borderline	04	03	75%
Borderline Lepromatous	20	12	60%
Lepromatous Leprosy	21	16	76.1%
Histoid Leprosy	03	03 (01)	100%
ENL	09	05	55.5%
Inconclusive		26	
Total	**100**	**100**	-

Clinical and histopathological correlation was 100% in tuberculoid leprosy and Histoid leprosy, 76.9% in Borderline Tuberculoid leprosy, 60% in Borderline lepromatous leprosy, and 76.1% in Lepromatous Leprosy. Biopsies were inconclusive in 26 patients (Table-2, Figure-1).

Out of 100 biopsies, 30 smears were positive for 5 % AFB stain. 20% of smear positive patients had BI less than or equal to 3+ and 80% of patients had BI more than 3+ (Table-3, Figure-2).

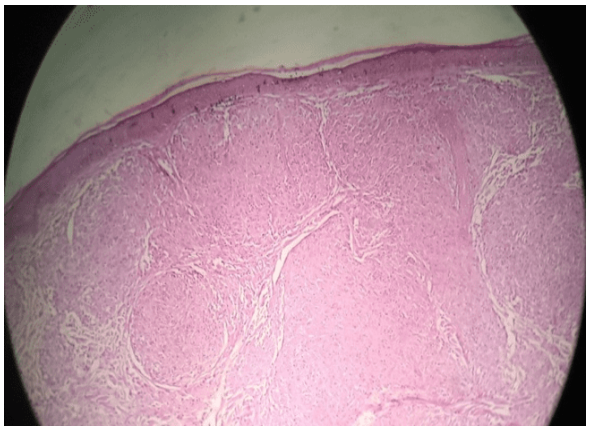

Figure-1: Histoid Leprosy (H & E, 10X)

Table-3: AFB Stain and Clinical Diagnosis

	Clinical Diagnosis (N=100)							
AFB	**Tuberculoid Leprosy**	**Borderline Tuberculoid**	**Mild Borderline**	**Borderline Lepromatous**	**Lepromatous Leprosy**	**Histoid**	**ENL**	**Total**
Positive (N)	0	5	0	11	9	2	3	30
Negative (N)	4	34	4	9	12	1	6	70
Total	4	39	4	20	21	3	9	100

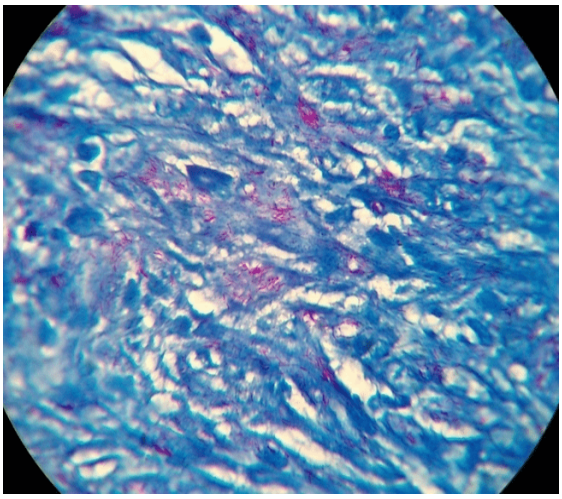

Figure-2: AFB Stain Positive (100X, BI 6)

Clinico-histopathological agreement was seen in 74% cases.

DISCUSSION

In the present study, Ridley-Jopling classification was used to classify leprosy histo-pathologically in all cases. Indeterminate leprosy was not included. Histoid leprosy is considered as a variant of Lepromatous leprosy and it was included in LL spectrum.

1. Age Distribution

In the present study a greater number of patients belonged to the age group of 21-30 years (36%). Similar findings were seen in studies by Moorthy BN et al,[8] with age group of 20-29 years (20.70%) and Singh et al[9] with age group of patient 21-40 years (48%). Santaram and Porichha[10] & Jindal et al[11] found the disease in 48% of patients belonging to the age

group of 21- 40 years. So, the age incidence in the present study correlates well with the other studies. The disease is more common in this age group because of their mobility and increased opportunity for contacts.

2. Sex Distribution

In our study 75% patients were males, which is comparable to the findings of Moorthy et al[8] (65.05% males), Singhet al[9] (69% males), Santaramet al[10] (80% males) and Nitesh Mohan et al[12] (72.10% males). This disease is more common in males because of their outdoor works and higher chances of getting infection.

3. Clinical Diagnosis

In the present study, out of 100 patients, 39% were diagnosed as BT, 21% as LL, 20% as BL, 4% as TT, 4% as BB, 3% as histoid leprosy and 9% as ENL. 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. Ramanjanayalu[13] and Zhongdong[14] found that majority of patients had BT. Similarly, Jindal et al[11] found LL in 33%, BT in 28%, BL in 23%, TT in 5.5% and BB in 4% of patients. Vara and Marfatiya[15] also found BT in 36%, LL in 52%, TT in 13%, BB in 9% and BL and pure neuritic in 8%. Thus, the results in the present study correlate well with other studies and most common clinical type was Borderline Tuberculoid.

4. Acid Fast Bacilli

In the present study, 30% of patients showed smear positivity and 70% of patients showed smear negativity. Smear positivity was less than 3+ in 20% of patients and more than 3+ in 80% of patients. All TL patients were smear negative. 5% of BT patients were smear positive. Ramanjanayalu[13] found overall positivity in 39% of patients and negativity in 60% of patients. Vara and Marfatiya[15] found positivity in 38% of patients. In another study of Vara[16], smear positivity was less than 3+ in 28% of patients and more than 3+ in 18% of patients. Thus, the smear positivity in the present study is more than above mentioned studies. This is probably because of clinical typing of patients.

5. Histopathological Distribution

In our study, 30% of patients were histo-pathologically diagnosed as BT patients, 16% as LL, 12% as BL, 3% as BB, 4% as TT, 4% as histoid leprosy, 5% as ENL and 26 % as inconclusive. 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. The study of Manandhar et al[17], had 40% of patients histo-pathologically diagnosed as BT. Thus, histologically, the common finding was Borderline Tuberculoid in all studies.

6.Clinico-Histopathological Correlation

Clinico-histopathological agreement was seen in 74 (74%) cases and disagreement in 26 (26%) cases.

7.Concordance Percentage

In present study, concordance percentage was 71.62% which was comparable to Manandhar etal[17] (45.33). Thapaetal[18] had a concordance of 11.26%.

Highest percentage of clinicopathological correlation was found in Lepromatous leprosy and Tuberculoid leprosy in study by Manandhar et al,[17] Moorthy etal[18] and Mohanet al[19] which was comparable to present study and least clinic-pathological correlation in mid borderline lepromatous leprosy.

CONCLUSIONS

Histopathological examination of the lesions confirms the exact subtype of the disease and facilitates accurate mode of therapy. So, correlation of clinical and histopathological features along with bacteriological index is more useful for accurate typing of leprosy than considering single parameter alone.

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