



A CLINICO- HISTOPATHOLOGICAL STUDY OF LEPROSY IN TERTIARY CARE HOSPITAL

Pathology

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ABSTRACT

Introduction: Leprosy (also known as Hansen disease) is a chronic granulomatous infection caused by *M. leprae* and that predominantly affects the skin and peripheral nerves, mucosa of upper respiratory tract and the eyes. Due to its clinical diversity and ability to mimic other skin diseases, it is difficult to diagnose leprosy clinically in early stages. Thus, histopathological examination of skin biopsies plays a pivotal role in early diagnosis, categorization, and treatment to prevent permanent nerve damage. **Methods:** The present study was carried out at department of Pathology, B. J. Medical College, Ahmedabad. 55 cases of leprosy which underwent skin biopsy for histopathological examination during the period January 2023 to June 2023 were included in the study. All these biopsies were fixed in 10% formalin, processed and embedded in paraffin blocks and stained with hematoxylin and eosin. **Observation:** A total of 55 cases of leprosy were included in the present study out of which 38(69.09 %) were males and 17(30.91%) females. Maximum numbers of cases were seen in the age group of 21-40 years (52.72%). The most common type was Lepromatous Leprosy (LL) in 16 cases (29.1%) followed by tuberculoid leprosy (TT) in 10 cases (18.2%). Maximum agreement was seen in Lepromatous Leprosy (LL) (92.3%) followed by Borderline Lepromatous Leprosy (BL) (77.8%), Tuberculoid leprosy (TT) (75%), Erythema Nodosum Leprosum (ENL), Mid-borderline leprosy (BB) (60%), Borderline Tuberculoid leprosy (BT) (60%) and Indeterminate Leprosy (IL) (33.3%). **Conclusion:** Histopathological examination of skin lesions is an important tool in the accurate classification of leprosy. Clinical diagnosis of early leprosy lesion offer difficulties hence biopsies should be done in all suspected leprosy cases. Result of clinico-histopathological correlation of leprosy cases are essential for early and accurate diagnosis and typing of leprosy which is helpful in prevention of deformities and drug resistance by early and appropriate treatment.

KEYWORDS

Leprosy, Histopathology, Lepromatous, Tuberculoid.

INTRODUCTION:

Leprosy (also known as Hansen disease) is a chronic granulomatous infection caused by *M. leprae* and that predominantly affects the skin and peripheral nerves, mucosa of upper respiratory tract and the eyes. The mode of transmission of leprosy is unknown, but the transmissibility is thought to be low. The mechanism is probably inhalation of bacilli, which may be excreted from the nasal passages of a multibacillary patient or possibly implanted from organisms in the soil^[1]. The disease manifests in two polar forms, lepromatous and tuberculoid leprosy, lying on both sides of a wide range. Between these two polar forms lie the borderline and intermediate forms.^[2]

India had a prevalence of <1/10,000 population which is the target of elimination as a public health problem. The number of districts with prevalence between 1 and 2/10,000 were 76, number of districts with prevalence between >2 and 5/10,000 were 39, and those between 5 and 10 were 2. Despite the above successes, the fact remains that India continues to account for 60% of new cases reported globally each year and is among the 22 “global priority countries” that contribute 95% of world numbers of leprosy warranting a sustained effort to bring the numbers down.^[3]

Due to its clinical diversity and ability to mimic other skin diseases, it is difficult to diagnose leprosy clinically in early stages. Thus, histopathological examination of skin biopsies plays a pivotal role in early diagnosis, categorization, and treatment to prevent permanent nerve damage.^[4]

The disease spectrum has been characterised in a number of classification systems, most widely being the Ridley-Jopling classification. In this classification, leprosy has been divided into five groups as Tuberculoid (TT), Borderline tuberculoid (BT), Mid-borderline (BB), Borderline Lepromatous (BL), and Lepromatous (LL).^[5] Indeterminate is an early type that is not included into any of the five categories. Histoid leprosy is an uncommon type of LL that has higher bacillary load and shows nodules or plaques^[6]. The present study was done to analyze the importance of histopathological examination in leprosy cases as an important diagnostic tool.

OBJECTIVES:

The present study was done to analyze the importance of histopathological examination in leprosy cases as an important diagnostic tool and correlate clinically.

MATERIAL AND METHODS:

The present study was carried out at department of Pathology, B. J. Medical College, Ahmedabad. 55 cases of leprosy which underwent skin biopsy for histopathological examination during the period January 2023 to June 2023 were included in the study. The criteria of Ridley and Jopling was utilized to diagnose and classify the cases clinically and histopathologically. All these biopsies were fixed in 10% formalin, processed and embedded in paraffin blocks. Sections of 4 µm thickness were cut and stained with hematoxylin and eosin. Fite faraco stain to demonstrate acid fast bacilli was also used.

Inclusion Criteria:

skin biopsies with provisional diagnosis or differential diagnosis of leprosy from skin department irrespective of age and gender of the patient were included.

Exclusion Criteria:

Those cases where leprosy was suspected clinically but not confirmed on biopsy were excluded.

OBSERVATION AND RESULTS:

A total of 55 cases of leprosy were included in the present study out of which 38(69.09 %) were males and 17(30.91%) females. Male to female ratio was 2.2:1. The age of the patients ranged from 1-80 years. Maximum number of cases was seen in the age group of 21-40 years (52.72%), followed by 41-60 years (29.10%), followed by 1-20 years (10.91%). Less numbers of cases are seen 61-80 years (7.27%).

Table 1: Gender wise distribution of leprosy lesions.

Types of leprosy	Male	Female	Total cases
TT	7(12.72%)	3(5.45%)	10(18.2%)
BT	5(9.09%)	2(3.63%)	7(12.72%)

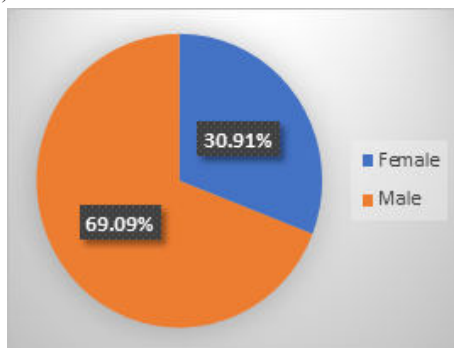
BB	3(5.45%)	2(3.63%)	5(9.09%)
BL	5(9.09%)	2(3.63%)	7(12.72%)
LL	11(20%)	5(9.09%)	16(29.1%)
IL	2(3.63%)	2(3.63%)	4(7.27%)
Histoid	3(5.45%)	1(1.81%)	4(7.27%)
ENL	2(3.63%)	0(0.0%)	2(3.63%)
Total	38(69.09%)	17(30.91%)	55

Table 2: Age wise distribution of leprosy lesions.

Types of leprosy	1-20 years	21-40 years	41-60 years	61-80 years	Total
TT	1	6	2	1	10
BT	1	3	2	1	7
BB	1	2	2	0	5
BL	1	4	1	1	7
LL	2	8	5	1	16
IL	0	2	2	0	4
Histoid	0	3	1	0	4
ENL	0	1	1	0	2
Total	6(10.91%)	29(52.72%)	16(29.10%)	4(7.27%)	55

Clinically the most common presentation was hypoesthetic, hypopigmented patches followed by erythematous lesions. Most common site of lesions were on upper limb followed by trunk, face and lower limb. Clinically the most common type was Lepromatous Leprosy in 13 cases (23.64%) followed by borderline tuberculoid in 10 cases (18.2%), and less common type was indeterminate leprosy and erythema nodosum leprosum (ENL) diagnosed in 3 cases (5.45%).

Among total 55 biopsies, on histopathological examination, the most common type seen was Lepromatous leprosy (LL) comprised of 16 cases (29.1%) followed by Tuberculoid Leprosy with 10 cases (18.2%) and Erythema Nodosum Leprosum (ENL) diagnosed in 2 cases (3.63%).

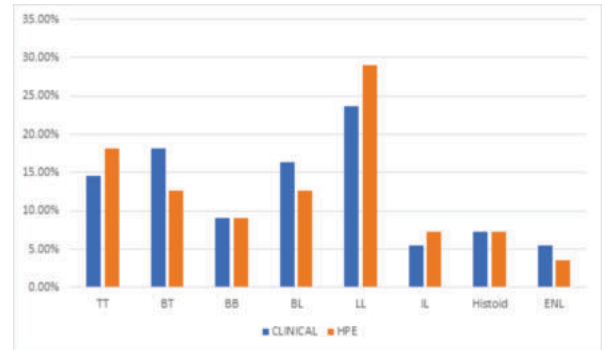
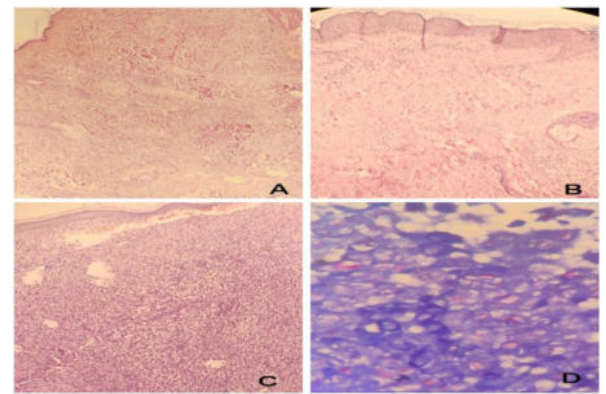
**Figure 1: Distribution Of Patients According To Gender.****Table 3: Clinical and histopathological types of leprosy.**

Types of leprosy	Clinical types		Histopathological types	
	Numbers	%	Number	%
TT	8	14.54	10	18.2
BT	10	18.2	7	12.72
BB	5	9.09	5	9.09
BL	9	16.36	7	12.72
LL	13	23.64	16	29.1
IL	3	5.45	4	7.27
Histoid	4	7.27	4	7.27
ENL	3	5.45	2	3.63
Total	55	100	55	100

Table 4: Clinico-Histopathological correlation of leprosy.

Clinical types	No. of cases	Histopathological types								Agreement (%)
		TT	BT	BB	BL	LL	IL	Histoid	ENL	
TT	8	6	1			1				75%
BT	10	2	6	1			1			60%
BB	5	1		3			1			60%
BL	9				7	2				77.8%
LL	13					12	1			92.3%
IL	3	1		1			1			33.33%
Histoid	4					1		3		75%
ENL	3								3	66.6%
Total	55	10	7	5	7	16	4	3	3	

As given in table 4, in Clinico-Histopathological correlation study, Maximum agreement was seen in LL (92.3%) followed by BL (77.8%), TT (75%), ENL (66.6%), BB (60%), BT (60%). Minimum agreement was seen in IL (33.33%).

**Figure 2: Clinico- Histopathological correlation of leprosy****Figure 3: A- Tuberculoid Leprosy (x200, H & E) B- Lepromatous Leprosy (x200, H & E) C- Histoid Leprosy (x200, H & E) D-FF stain show lepra bacilli in lepromatous leprosy (x1000, FF).**

DISCUSSION:

Leprosy is an infectious chronic granulomatous disease and highly curable disease. Clinical presentation varies from few to widespread lesions. Histopathology of skin lesions varies from compact granulomas to diffuse infiltration of dermis, which largely depends upon immune status of the patient and may not be in agreement with the clinical diagnosis. However clinical and histopathological disparities are seen due to varied clinical manifestations even in established leprosy, so individual lesion may differ microbiologically and histologically^[7]. In the present study, leprosy was showed marked predominance in males than in females with male to female ratio of 2.2:1. This findings correlate with Tilva et al, Tiwari et al, Manandhar^[8,9,10].

Out of total 55 cases, maximum cases are in age group 21-40 years (52.72%) which is comparable with other studies as Tiwari et al, Ramesh et al, Tilva et al^[7,8,9].

Present study has maximum numbers of LL which is comparable with Patel et al^[11]. In this study, lepromatous leprosy (29.1%) and tuberculoid leprosy (18.2%) were the most common histopathological type of leprosy which was comparable with Patel et al^[11] but incidence of LL was much higher in comparison with Bajrangi et al (15.7%)^[12], Nitesh Mohan et al (19.05%)^[5], Ruchi et al (11.5%)^[13]. This might be due to high infectivity of LL and increase occurrence of LL in Gujarat in comparison to other regions.

Table 5: Histopathological types of leprosy in other studies.

Type	Present study	Tilva et al ^[9]	Patel et al ^[11]	Ramesh et al ^[7]	Bajrangi et al ^[12]	Nitesh Mohan et al ^[5]
TT	18.2%	10.3%	18.58%	0.0%	12.8%	7.40%
BT	12.72%	9.5%	14.15%	50%	38.0%	44.44%
BB	9.09%	11.1%	0.0%	0.0%	16.4%	1.6%
BL	12.72%	12.7%	14.15%	18.18%	10.5%	12.70%
LL	29.1%	40.5%	35.39%	29.54%	15.7%	19.05%
IL	7.27%	0.0%	8.84%	0.0%	6.4%	14.82%

Histoid	7.27%	10.3%	7.96%	2.27%	0.0%	0.0%
ENL	3.63%	17.1%	0.88%	0.0%	0.0%	0.0%

Different studies showed variable clinico-histopathological correlation. In present study, maximum clinico-histopathological correlation seen in cases of which was comparable with Nitesh mohan^[5] et al in which LL cases show maximum correlation (97.22%), while in and kinni and chudhary et al^[14] show maximum correlation in Mid-borderline leprosy (97.8%). Sharma et al^[15] show maximum clinicopathological seen in cases of borderline lepromatous Leprosy (86.2%).

Table 6: Comparison of Clinico-Histopathological correlation.

Studies	TT	BT	BB	BL	LL	IL	Histoid	ENL
Present study	75%	60%	60%	77.8%	92.3 %	33.33 %	75%	66.6%
Nitesh mohan et al ^[5]	71.43 %	79.76 %	66.67 %	66.67 %	97.22 %	50.00 %	-	-
Kini and Chaudhary ^[14]	92.4%	82%	97.8 %	92.6%	96.8 %	93.8 %	-	-
Sharma et al ^[15]	80.0%	56.0%	50.0 %	86.2%	77.4 %	68.4 %	85.7%	-

CONCLUSION:

Leprosy is a chronic granulomatous disease widely prevalent in India and is present in different clinico-pathological forms. Study of these lesions has contributed a great deal in understanding the disease. Histopathological examination of skin lesion is an important tool in the accurate classification of leprosy. Clinical diagnosis of early leprosy lesion offer difficulties hence biopsies should be done in all suspected leprosy cases. Result of Clinico-histopathological correlation of leprosy cases are essential for early and accurate diagnosis and typing of leprosy which is helpful in prevention of deformities and drug resistance by early and appropriate treatment.

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