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HISTOPATHOLOGICAL STUDY OF LEPROSY

Pathology

Dr. Poorva Kalsariya Senior Resident, Department of Pathology, B.J.Medical College, Ahmedabad, India.

Dr. Hemina Desai Professor; Department of Pathology, B.J.MedicalCollege, Civil Hospital, Ahmedabad.

ABSTRACT

Introduction: Leprosy or Hansen's disease is a chronic infectious disease that mainly affects skin and peripheral nerves. Histopathology and demonstration of lepra bacilli is a vital tool to supplement clinical examination and diagnosis for correct classification and therefore treatment of patients. **Aims:** 1.To study the histopathological features of leprosy in skin biopsies and to categorize them into various types based on microscopy. 2.To determine the bacillary index in each case. **Material And Method:** Skin biopsies after adequate fixation in 10% of formalin, were routinely processed and paraffin embedded section of 5 µm thickness were stained with Hematoxylene -Eosin and Fite- Faraco (FF) stain and were studied by microscopic examination further typing of leprosy was done and bacillary index was determined by studying FF stained sections. **Result:** Total 84 Skin biopsies diagnosed as leprosy and were studied over a period of two years. Male to Female ratio of patients was 2.65:1 and maximum number of cases were seen in the 4th decade of life. Lepromatous leprosy (28 Cases) and tuberculoid leprosy (28 Cases) were most common type of leprosy, followed by borderline lepromatous leprosy (15 Cases), histoid leprosy (11 Cases), indeterminate (2 Cases) and borderline tuberculoid leprosy (1 Case). There were 13 biopies with lepra reaction, 12 of erythema nodosum leprosum and 1of type 1 reaction. In present study, Bacillary index of Lepromatus leprosy is 4-5, Histoid leprosy is 6-8 and of Tuberculoid leprosy is 2-3. **Conclusion:** Histological examination along with bacillary index are gold standard for accurate diagnosis and typing of leprosy as well as for the management of patient.

KEYWORDS

Leprosy, Histopathology, Bacillary index.

INTRODUCTION

Leprosy is a chronic infectious disease caused by Mycobacterium Leprae, principally affecting the cooler parts of the body, mainly skin and peripheral nerves; it also involves muscles, eye, bones, testis and internal organs[1]. Leprosy is one of the leading causes of physical disabilities, which contribute to intense social stigma resulting in discrimination of patients and their families [2]

Leprosy is known, since ancient times as “Kushtaroga”.The causative agent of leprosy, 'M.leprae' was discovered in 1873 by Armauer Hansen. Even though, it was discovered early,it was not been cultured as yet[2].

The World Health Assembly passed a resolution in 1991 to “Eliminate leprosy as a public health problem” by 2000; it defined elimination as reducing prevalence to less than one case per 10,000 population[3].

Histopathologial study of leposy is very important in understanding the disease, its varied manifestation and complications. Hense clinicpathological correlation is extremely important in patient care and management. Since exact typing of leprosy is sometimes clinically not possible, added to this the poor results obtained by slit skin smear will lead to false negative diagnosis. To prevent this, histopathological examination should be done in all suspected cases[2].

AIMS:

1.To study the histopathological features of leprosy in skin biopsies and to categorize them into various types based on microscopy.
2.To determine the bacillary index in each case.

MATERIALS AND METHODS:

Present study on histological analysis of skin biopsies in leprosy was undertaken in department of pathology, B.J.Medical collage, Ahmedbad over a period of two years.

Punch biopsy perfomed by the Dermatologist and were sent to the Department of pathology in 10% formalin. After adequate fixation, the biopsies were submitted for routine praffin processing, and stained with Hematoxylin and Eosin(H & E) for morphological analysis followed by Fite-Faraco stain Wade-Fite method for M.leprae in paraffin section for identifying the bacilli.

The sections were observed under oil immersion using x100 objectives. The bacillary index(BI) was assessed in exactly the same way as the followed for smear.

Following was the scale used to calculate the BI[2].

1+ = 1-10 bacilli in 100 oil immersion filed(OIF)- examine 100 OIF
2+ = 1-10 bacilli in 10 OIF- examine 100 OIF
3+ = 1-10 bacilii in 1 OIF- examine 25 OIF
4+ = 10-100 bacilli in 1 OIF- examine 25 OIF
5+ = 100-1000 bacilli in 1 OIF- examine 25 OIF
6+ =/> 1000 bacilli in 1 OIF- examine 25 OIF

H and E stained sections were studied to observe the various changes that occurred in the epidermis, papillary, reticular, deep dermis, neurovascular bundles and adenexa.

Diagnoses were made based on histopathology and bacillary index(BI) and were classified according to Ridley and Jopling classification.

RESULT:

The present study included 84 skin biopsies from patients who were clinically diagnosed with leprosy and histological typing of leprosy with incidence was as shown in table 1.

Table 1: Types Of Leprosy

Types	No. of Cases
LL	28(33.33%)
TT	28(33.33%)
BL	14(16.66%)
HL	11(13.09%)
IL	2(2.38%)
BTL	1(1.19%)

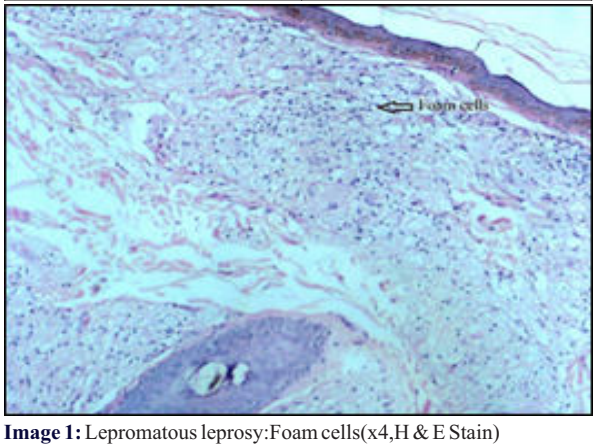

Image 1: Lepromatous leprosy:Foam cells(x4,H & E Stain)

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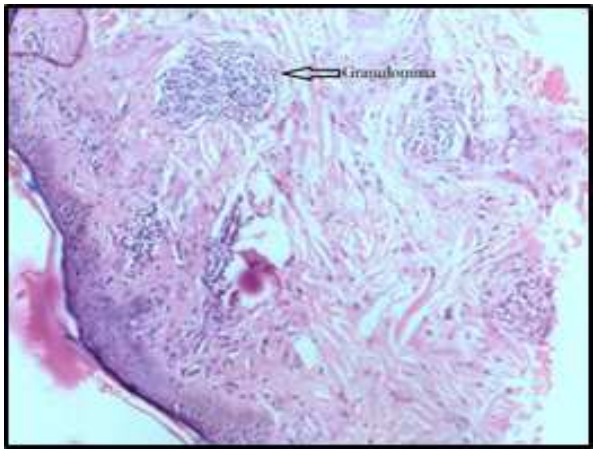

Image 2: Tuberculoid leprosy(TL)(x4, H & E stain)

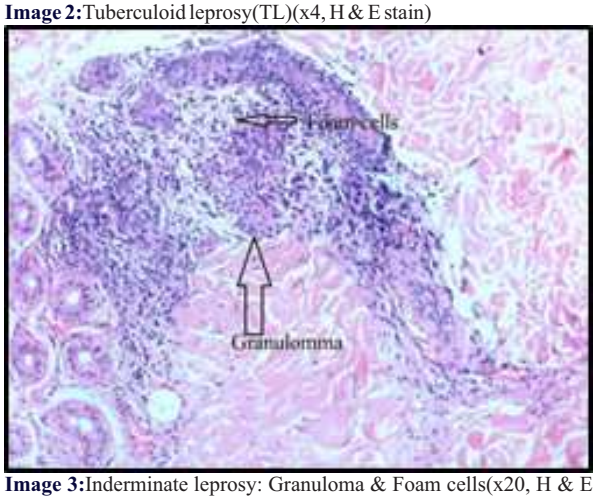

Image 3: Inderminate leprosy: Granuloma & Foam cells(x20, H & E Stain)

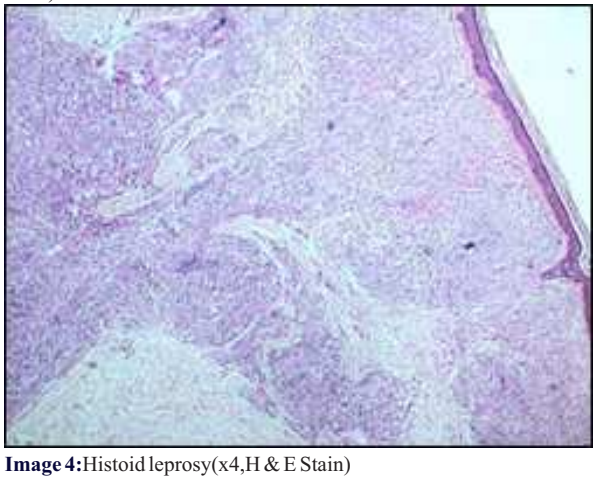

Image 4: Histoid leprosy(x4,H & E Stain)

Patient's age ranged from 4 years to 74 years and maximum number of cases were seen in 4th decade of life.

Table 2: Bacillary Index Of Biopsies

Type	No. of cases	Bacillary index						
		PB	MB					
			1+	2+	3+	4+	5+	6+
LL	28	19	-	-	-	3	6	-
TL	28	23	-	3	2	-	-	-
BL	14	8	-	3	3	-	-	-
HL	11	7	-	-	-	-	-	4
IL	2	1	1	-	-	-	-	-
BTL	1	-	-	-	-	-	1	-
TOTAL	(84)	(58)	1	6	5	3	7	4
					(26)			

There were 61(72.61%) male patients and 23(27.38%) female patients, with male to female ratio(M:F) of 2.65:1 had most common clinical fetures noted in this study was a loss of sensation, 90% of cases were reported and 65% of cases noted with nerve thickening, 60% with hypopigmented skin lesions.

In this study, Bacillary index of various types of leprosy as shown in table 2.

The incidence of lepra reactions was as shown in table 3.

Table 3: Lepra Reaction In Various Types

TYPES	No. of cases	LEPRA REACTION
LL	28	10
TL	28	1
BL	14	1
HL	11	1
IL	2	-
BTL	1	-

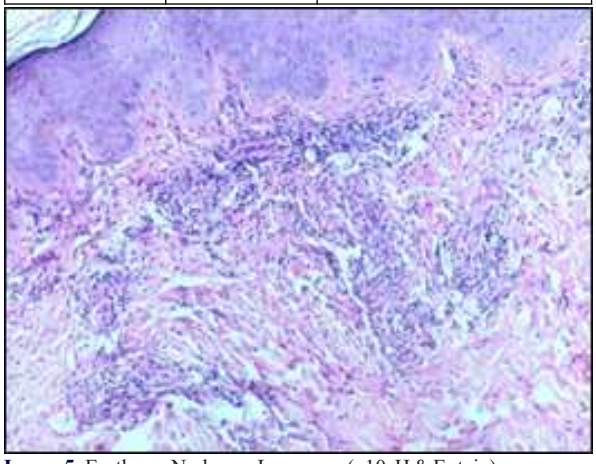

Image 5: Erythema Nodosum Leprosum (x10, H & E stain)

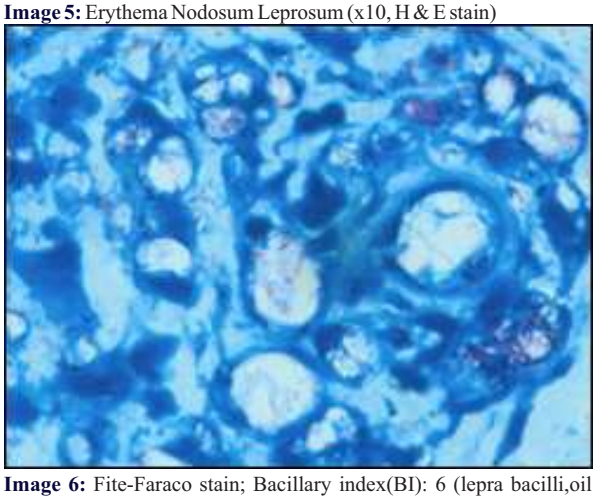

Image 6: Fite-Faraco stain; Bacillary index(BI): 6 (lepra bacilli,oil immersion)

DISCUSSION:

Accurate diagnosis is of fundamental importance to all aspects of leprosy namely epidemiology, management and prevention of disability[2].

The type of leprosy that patients develop is determined by their cell-mediated immune response to infection. Patients with the TT disease have a good cell-mediated immune response and fewer lesions while LL have multiple lesions. In borderline leprosy types, patients have some cell-mediated immune response , multiple lesions and unstable immunity[3].Histoid leprosy show typical spindle shaped macrophages and BI of 6.

Table 4: Comparison Of The Histologic Spectrum Of Leprosy

Type	present study(%)	V Prabha et al.(%)[3]	Tiwari et al.(%)[4]
LL	33.33	26.6	3.8
TL	33.33	14.3	7.5

BL	16.66	25.3	15
HL	13.09	1.9	0
IL	2.38	1.3	26.4
BTL	1.19	16.9	41.5

Summary:
Most of the patients affected were in the age range of 4 - 74 years, male to female ratio of 2.65:1. LL type was the commonest type of leprosy. Most common features were loss of sensation. Grenz zone was present in all biopsy of LL, Well-formed epitheliod granulomas were observed in all cases of TT. Lymphohistiocytic aggregates/ ILL formed granulomas were seen around nerve bundles and appendages in BT type. Therefore, biopsies from BL and LL showed diffuse macrophage aggregate with few lymphocytic infiltrate in BL type. In lepra reaction, 12(92.30%) were of Erythema Nodosum Leprosum(type 2) reaction and 1(7.69%) were of type 1 reaction. PB type was more common and bacillary load increased as patients moved towards lepromatous pole. Bacillary index of Lepromatous leprosy was 4+, Histoid leprosy was 6+ and of Tuberculoid leprosy was 2+ noted.

CONCLUSION:

Histopathological examination continues to be an important tool in accurate diagnosis and classification of leprosy and still remains the gold standard.

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