CLINICOPATHOLOGICAL CORRELATION IN LEPROSY-A ONE YEAR STUDY

Pathology

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ABSTRACT

Leprosy, a chronic infectious disease caused by Mycobacterium leprae, is one of the major public health problems in India though the prevalence is declining with multidrug therapy . The spectrum of disease in leprosy has been characterized in a number of clinico-immunopathological classification systems, the most widely used being the Ridley- Jopling classification

OBJECTIVES: (i) To correlate clinical diagnosis with histopathological diagnosis of leprosy, (ii) To study the histopathological spectrum of leprosy according to Ridley-Jopling classification, (iii) To study bacterial index in different types of leprosy

METHODS: A retrospective study of one year from August 2012 to July 2013 was conducted. Among which suspected, diagnosed and relapsed cases of leprosy were included. Skin biopsy from active lesions was taken and stained with Hematoxylin and Eosin, Modified FiteFarraco was done for identification of Mycobacterium Leprae. The histopathological findings were compared with clinical diagnosis.

RESULTS: A total 104 skin biopsies were studied, out of which 60 (76 %) were males and 19 (24 %) were females between 11 and 80 years. The majority were (60.9%)in the age group of 21 to 40 years. In our study 79 (75.9%) cases were confirmed as leprosy on biopsy. Majority were Lepromatous leprosy (LL- 39) followed by borderline tuberculoid leprosy (BT- 30), borderline lepromatous leprosy (BL-5), tuberculoid leprosy (TL-3), indeterminate (2). The clinico-histomorphological concordance was maximum in lepromatous polar form . Two cases diagnosed as leprosy turned out to be fungal folliculitis and a single case of vasculitis.

CONCLUSION: Due to its clinical diversity as well as its ability to mimic other diseases sometimes leprosy is difficult to diagnose clinically. Hence skin biopsy is a useful tool in confirming the clinical diagnosis of leprosy as well as for thetherapeutic guide.

KEYWORDS

Leprosy ; Mycobacterium leprae; Lepromatous leprosy; Tuberculoid leprosy

INTRODUCTION

Leprosy is a chronic, infectious disease caused by Mycobacterium leprae. It usually affects the skin and peripheral nerves. Occurence of the disease depends upon the immunological status of the individual which in turn is influenced by the genetic factors. Leprosy is a social disease and is generally associated with poverty related factors. Among the communicable diseases, leprosy is a leading cause of permanent physical disability [1]. The spectrum of disease in leprosy has been characterized in a number of clinico-immunopathological classification systems, the most widely used being the Ridley- Jopling classification(2,3,4)

AIMS AND OBJECTIVES:

1. To correlate clinical diagnosis with histopathological diagnosis of leprosy
2. To study the histopathological spectrum of leprosy according to Ridley-Jopling classification.
3. To study bacterial index in different types of leprosy

MATERIALS AND METHODS:

A retrospective study of one year from August 2012 to July 2013 was conducted in a tertiary care institute. In this study suspected, diagnosed and relapsed cases of leprosy were included.

Skin biopsy from active lesions was taken and stained with Hematoxylin and Eosin. Modified Fite Faraco was done for identification of Mycobacterium Leprae.

The histopathological findings were compared with clinical diagnosis.

Observation:

The findings were studied under the following parameters
1. Distribution of cases
2. Age wise distribution
3. Sex wise distribution
4. Type of Leprosy
5. Bacterial index in different types of Leprosy
6. Correlation of clinical diagnosis with histopathological diagnosis of leprosy

Distribution of case – the total number of skin biopsies done during the study was 104. Out of these, 79 cases were of Leprosy while were of other skin conditions (Non Specific Dermatitis - 22, Fungal Folliculitis – 2 and Vasculitis – 1.

Table 1: Showing distribution of cases.

DIAGNOSIS	NO. OF CASES
LEPROSY	79
OTHERS	25

Age wise distribution – Maximum cases were found in the age group 21 to 30 years (33 cases) and 31 to 40 years (32 cases). The other age wise distribution was 11 -21 years (7 cases), 41 to 50 years (16 cases), 51 to 60 years (8 cases), 61 to 70 years (6 cases) and 71 to 80 years (2 cases).

Table 2: Age wise distribution.

AGE	YRS
11 to 20 YRS	7
21 to 30 YRS	33
31 to 40 YRS	32
41 to 50 YRS	16
51 to 60 YRS	8
61 to 70 YRS	6
71 to 80 YRS	2

3. Sex wise distribution – Out of the 79 cases, 60 cases (76%) were found in males and 19 cases (24%) were found in females.

Table3:Sexwise distribution

SEX DISTRIBUTION	PERCENTAGE
MALES	76%
FEMALES	24%

4. Type of Leprosy – The distribution of types of Leprosy is given in Table 1. Maximum cases seen were of Lepromatous leprosy-LL (39 cases), followed by Borderline Tuberculoid- BT (30 cases).

Table 4: Histological diagnosis.

Histological Diagnosis	No. of Cases
TT	3

BT	30
BB	0
BL	5
LL	39
IL	2

5. Bacterial index in different types of Leprosy - The distribution of Bacterial index in different types of Leprosy is given in Table 1. Most of the cases (14) in Lepromatous leprosy-LL show a Bacterial index of +6, while most of the cases (27) in Borderline Tuberculoid leprosy- BT show a Bacterial index 0.

Table 5: Bacterial Index in various types of leprosy.

TYPE OF LEPROSY	NO. OF CASES	BACTERIAL INDEX						
		0	+1	+2	+3	+4	+5	+6
TT	3	3						
BT	30	27	3					
BL	5	-	-	-	1	3	1	-
LL	39	-	-	-	7	8	10	14
IL	2	2	-	-	-	-	-	-

6. Correlation of clinical diagnosis with histopathological diagnosis of leprosy – Maximum concordance is seen in borderline tuberculoid leprosy followed by lepromatous leprosy. Many of the cases clinically were broadly categorized as Hansen's disease in the study.

Table 6: Clinical & Histopathological correlation.

HISTOPATHOLOGICAL DIAGNOSIS	CLINICAL DIAGNOSIS						
	TT	BT	BB	BL	LL	IL	% Agreement
TT	1	1	1	-	-	-	33.33
BT	2	23	-	2	1	1	79.31
BB	-	-	-	-	-	-	-
BL	-	-	-	3	1	-	60
LL	-	-	-	3	10	-	69.23
IL	-	2	-	-	-	-	0

Figure A & 1B - Erythematous indurated plaques in Lepromatous leprosy
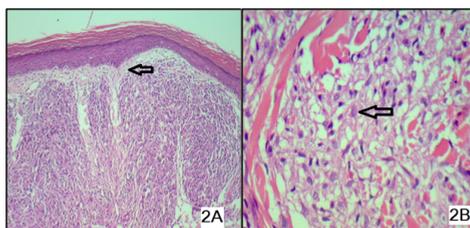

Figure 2A- Lepromatous leprosy narrow grenz zone (100X) Figure 2B-Lepromatpous leprosy diffuse infiltrate of foamy macrophages (400X)
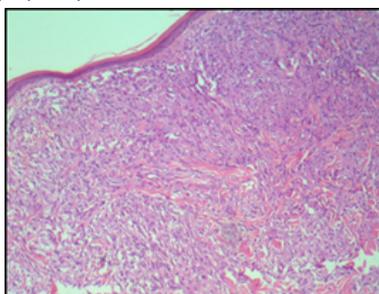

Figure 3 -Histoid leprosy : spindle shaped histiocytes in storiform pattern with stretched epidermis
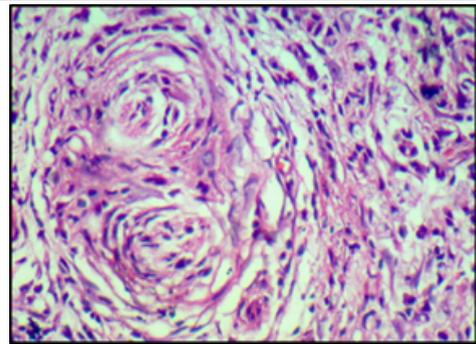

Figure 4- Borderline lepromatousleprosy :Perineural fibroblast proliferation forming an onion skin in cross section(400)

Figure 5A & 5B - Borderline Tuberculoid leprosy: Hypopigmented macules
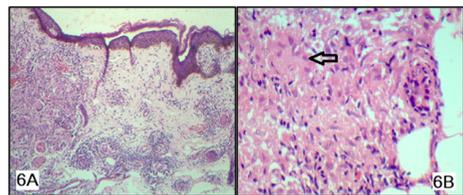

Figure 6A- Tuberculoid polar leprosy:well defined granulomas reaching up to the epidermis with peripheral lymphocytes (100X) Figure 6B-Tuberculoid polar leprosy: Compact epithelioid granuloma with Langhan's giant cell (400X).
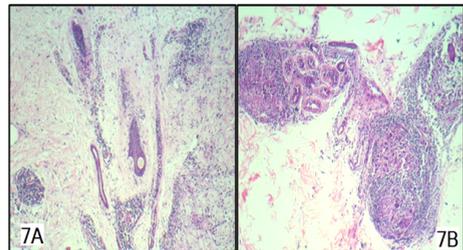

Figure 7A- Borderline Tuberculoid leprosy: Multiple small granulomas around neurovascular bundles & sweat glands (40X & 100X) Figure 7B- Borderline Tuberculoid leprosy: Multiple small granulomas around neurovascular bundles & sweat glands
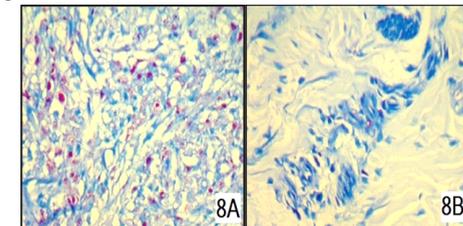

Figure 8A- Fite –Faraco stain for AFB, bacterial index 6+, (100x). Figure 8B-Fite –Faraco stain for AFB bacterial index 1+, (100x)

Tuberculoid (TT) Leprosy histopathologically showed epithelioid granulomas with Langhan's giant cells surrounded by dense lymphocytic infiltrate.(Figure 6A & 6B). In this nerve infiltration is usually seen. A Tuberculoid leprosy need to be distinguished from many other granulomatous dermatitis, such as tuberculosis, leishmaniasis, late secondary and tertiary syphillis etc. Presence of

acid fast bacilli in nerves is conclusive proof of leprosy.(Figure 8B)

Borderline Tuberculoid (BT) Microscopically showed multiple small epithelioid granulomas around neurovascular bundles & sweat glands, Langhans giant cells & peripheral lymphocytes.(Figure 5A, 5B,7A,7B,8B).

Indeterminate Leprosy histologically showed lymphocytes and histiocytes around skin structures. AFB are very scanty. Other helpful diagnostic features –intraneural granuloma verticalperineurovascular / periadnexal distribution of inflammation non hyperplastic flat epidermis These features overlap with many specific and non specific dermatitis. Finding bacilli in nerves, errectorpili muscle, macrophages is critical.In the absence of bacilli and presence of pandermal infiltrate leprosy can only be suspected.

Borderline Leprosy (BB) it showed epithelioid granulomas with diffusely spread lymphocytes, presence of subepidermal clear zone. AFB usually seen.

Borderline Leprosy (BL) microscopically showed loose granuloms composed of histicocytic cells with dense lymphocytic infiltrate. AFB usually seen but large globi are not seen.(Figure 4).

Lepromatous Leprosy (LL) it showed characteristic features like thinning of epidermis, Clear zone under epidermis, dermis showed abundant histiocytes and foam cells. Nerves are without cellular infiltrate or cuffing. AFB are numerous. (Figure 1A,1B,2A, 2B & 8A)

Histoid Leprosy (HLL) it is a nodular form of leprosy. microscopically showed circumscribed nodules with spindle shaped histiocytes in storiform pattern with stretched epidermis. (Figure Other mycobacterioses in immunosuppressed patients such as M.aviumintracellulare may produce histoid like multibacillarylesions, however nerves are not involved in this lesion Histoid leprosy can be confused with dermatofibroma Staining for acid fast bacilli is helpful.

DISCUSSION:
Leprosy can occur at any age but more commonly seen in the age group between 20 to 30 years(1), as Bhanushree et al (5), In our study we found maximum cases (60.9%) in the age group of 21 to 40 years. Similar to kadam et al (6), Same findings were noted in other studies (7,8,9). The age difference may be due to differences in exposure and opportunities of infection is more in this working age group.

Leprosy affects both the sexes, however, males are affected more often as compared to females, generally in the proportion of 2:1 (1). Out of 79 cases diagnosed as leprosy 60 were males and 19 were females with male: female ratio 3.1: 1, in our study male : female ratio is little higher than other studies , 2.3 :1 in B Mehta et al (10).

Out of 104 skin biopsies, 79 were confirmed as leprosy on histopathology and remaining were reported as non-specific dermatitis (22 cases), fungal folliculitis (2 cases), vasculitis (1 case).

The clinic-pathological correlation discordance is noted because clinical diagnosis is based on Ridley-Jopling classification even when biopsy has not done. Since biopsy findings may be influenced by biopsy site, age of the lesion, morphology of the lesion, immunological and treatment status of the patient.(11).

In the present study complete parity between clinical type and histopathological type was noted in 79.7% cases which was quite good compared to other studies,Nadia et al.(79.2%)(11) Bhatia et al,Kalla et al .Nadkarni et al found 98% correlation in LL (12,13,14,15,16).Maximum correlation was noted in lepromatous group including type 2 reactions as it shows fixed histopathology as well as clinical presentation.(11) In our study least parity is seen in midborderline/ indeterminate leprosy because in this form histopathology is not characteristic. Similar findings were also noted by Singhi et al. Sharma et al, Manandhar et al, Mitra et al, Moorthy et al (7,17,18,19,20). In the present study 2 cases were given diagnosis as indeterminate leprosy which wasclini9cally diagnosed as borderline tuberculoid. Indeterminate lesions cannot be classified within Ridley – Jopling spectrum due to lack distinguishing features like not finding granulomas granulomas and this happens more on histopathology (11), which showed without demonstrating bacilli the diagnosis can only be presumptive.

We found more multibacillary leprosy cases (60.75%) compared to paucibacillary leprosy cases (39.24%). This varies in different studies due to different socioeconomic and immune status of population. However the diagnosis can not be made only on the basis of bacteriological index as it can vary in various type of leprosy( ). In present study acid fast bacilli were seen in all BL and LL.High bacteriological index (5+, 6+) was seen in LL.

CONCLUSION:
Leprosy still continues to be one of the common infectious diseases in our country.Due to clinical diversity as well as ability to mimic other diseases sometimes leprosy is difficult to diagnose clinically. Correlation of clinical as well as histopathological features along with bacterial index appears to be more useful for accurate typing of leprosy.

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