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HISTOPATHOLOGICAL SPECTRUM OF LEPROSY: A RETROSPECTIVE STUDY

Pathology

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ABSTRACT

Background: Leprosy is one of the oldest and chronic infectious diseases known to human being caused by Mycobacterium leprae. Leprosy has been declared eliminated(prevalence rate<1/10000 population) as an important public health problem in our country on January 1,2006,still cases are being reported with varying prevalence throughout many areas in India. Histopathology helps in confirming the diagnosis for clinically suspicious cases and helps in exact typing which, in turn, influences treatment plan. **Aim:** To evaluate the importance of skin biopsy and histopathological examination in detecting, diagnosing and subtyping of leprosy. **Materials And Methods**: Total 134 skin biopsies were received in histopathology section, pathology department at Medical College, Baroda, Gujarat. This was a retrospective study of 134 cases which were clinically suspected. Skin biopsies were received, processed and stained by H and E stain followed by Fite faraco stain method to classify histopathological types of leprosy. **Results:** Total 134 cases were studied, out of them 75 (55.97%) were males and 59(44.02%) were females. Majority of them belonged to 41-50 years age group. Borderline Tuberculoid leprosy was noted maximum in 32.08% cases. **Conclusion:** Histopathology plays an important role in making definite diagnosis of leprosy. So histopathological examination of the active skin lesions should be done in all new cases to confirm the spectrum of disease and expected duration of therapy.

KEYWORDS

Leprosy, skin lesion, borderline tuberculoid, skin biopsy

INTRODUCTION

Skin lesions occur on any part of our body and may cover a tiny or large area. Skin lesions can be singular or multiple, confined to one specific area of our body or distributed widely. It may be due to many causes as harmless as scrape or as serious as skin cancer.[1]

Leprosy is one of the most ancient diseases known to mankind. It is a chronic, debilitating, granulomatous disease caused by Mycobacterium leprae. The bacteria were discovered by Hansen in 1837. Interestingly, the organism cannot be cultured.[1]It is an important public health menace, being prevalent throughout many areas in India and still carrying a social stigma for the patients affected. Leprosy mainly affects the skin, causing lesions and anaesthesia, along with enlarged and thickened peripheral nerves.[2] It has different histopathological forms depending on the immunity of the patient.[3]The Ridley-Jopling classification is the most widely used and divides the disease into tuberculoid (TT), borderline tuberculoid (BT), mid-borderline (BB), borderline lepromatous (BL) and lepromatous leprosy (LL), based on clinical, immunological and histomorphological features.[2]

Clinical classification describes only the gross appearances of the lesions, while the criteria used in the histopathological classification are well defined, precise and also take into account the immunological manifestations which enable it to successfully bridge the pitfalls in leprosy diagnosis. Suspicious cases which can be missed in clinical practice and epidemiological studies, can be confirmed histopathologically. It is a valuable aid to reach confirmatory diagnosis and its subtypes, prognosis, an assessment or regression of the disease in patient under treatment and also for research purpose.[3] Histopathological examination is important for exact classification of leprosy, and confirmation of suspected cases with varied presentations and complications so as to provide appropriate management of patients.[4]

Diagnosis of leprosy is based on different clinical parameters which involves detailed examination of skin lesions and peripheral nerves. Demonstration of acid –fast bacilli in slit skin smears by Ziehl-Neelsen's staining also aids in diagnosis of leprosy. A reliable diagnosis hinges around a good histopathological diagnosis and demonstration of bacilli in histopathological sections.[5]

MATERIALS AND METHODS

A retrospective study was carried out over a period of 3.5 years from January 2019 to August 2022 in pathology department at Baroda Medical College. Total 134 skin biopsies of clinically suspected leprosy were received. The skin biopsies were fixed in 10% formalin and were subjected to processing in automated tissue processor followed by embedding and section cutting for preparation of slides. The slides were stained with routine hematoxylin and eosin and Fite-Faraco stain whenever necessary. Slides were examined under light microscopy and diagnosis of leprosy made according to ridley jopling classification.

RESULTS

The present study included 134 skin biopsies from the patient which were clinically suspected. The study shows a marked male predominance in cases diagnosed as leprosy (75 cases, 55.97%) as compared to females (59 cases, 44.02%). Maximum number of cases was seen in the age group) of 41-50 (36 cases,26.86%), followed by 31-40 years(32 cases,23.88%), followed by 21-30 years age group(22 cases,16.41%), less numbers of cases seen 11-20 years (8 cases,8.95%) and 71-80 years age group(3 cases,2.23%).

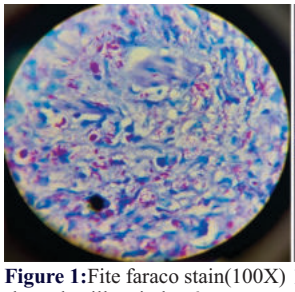

Figure 1: Fite faraco stain(100X) shows bacillary index 6

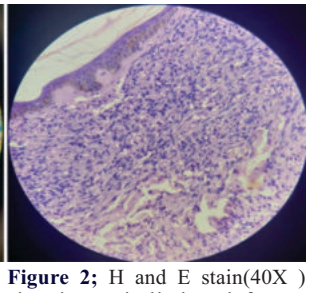

Figure 2; H and E stain(40X) showing spindled and foamy histiocytes in a case of histoid leprosy

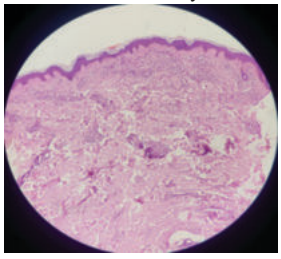

Figure 3:H and E stain(20X) showing grenz zone

Among total 134 skin biopsies, on histopathological examination, the most common type seen was borderline tuberculoid leprosy comprised of 40 cases (35.58%) followed by lepromatous leprosy with 21 cases (18.58%) and mid borderline leprosy diagnosed in 1 case(0.7%).Fite-Faraco staining to identify acid-fast bacilli (AFB) was done in all 134 cases. It was positive in 24(17.91%) of cases, whereas all cases of LL and Histoid types showed presence of acid-fast bacilli.

Table 1: Distribution of cases on histopathological examination

Type of leprosy	Number of cases	Percentage
TT	20	14.92
BT	43	32.08
BB	01	0.7
BL	15	11.19
LL	34	25.37
HL	16	11.94
IL	05	3.73

Table 2: Gender wise Distribution of Leprosy cases

Leprosy subtypes	11-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years	Total
TT	-	5	7	6	2	3	2	25
BT	7	3	10	16	3	3	1	43
BB	-	1	-	-	-	-	-	1
BL	2	1	4	2	1	3	-	13
LL	3	7	7	6	4	4	-	31
HL	-	4	3	4	4	1	-	16
IL	-	1	1	2	1	-	-	5
Total	12	22	32	36	15	14	3	134

Table 3: Age wise distribution of leprosy cases

Lesions	Male	Female	Total cases
Tuberculoid Leprosy	12(8.9%)	12(8.9%)	24(17.8%)
Borderline Tuberculoid Leprosy	24(17.9%)	19(14.17%)	43(32.08%)
Mid Borderline Leprosy	1(0.7%)	-	1(0.7%)
Borderline Lepromatous Leprosy	7(5.2%)	6(4.47%)	13(9.7%)
Lepromatous Leprosy	18(13.43%)	16(11.9%)	34(25.37%)
Histoid Leprosy	11(8.20%)	5(3.73%)	16(11.9%)
Indeterminate Leprosy	2(1.49%)	1(0.74%)	3(2.23%)

Table 4: FF stain positivity in various histological subtypes

Type of leprosy	Number of cases	Number of Fite-Faraco positive cases	Percentage of
TT	20	02	1.49
BT	43	02	1.49
BB	01	-	-
BL	15	01	0.7
LL	34	12	8.9
HL	16	06	4.47
IL	05	01	0.7

DISCUSSION

This was a retrospective study of 134 skin biopsies diagnosed as a leprosy on histopathological examination in pathology department at baroda medical college. Present study showed male predominance (55.97%),which is similar to findings made by other researchers like Vahini et al[18], Shivani Soni et al[19], Perona Roy et al[3]and Shindu Shree et al[17]showing male predominance with 72.5%, 97%, 68.97% and 82% respectively.

Most common age group affected were 21-50 years which correlated with similar with other studies like Manadhar et al[16] and Jindal et al[20].

In our study maximum cases was seen in BT (43 cases,32.08%), followed by LL (34 cases,25.37%), which co-related with Manandhar u et al [16]. While B Mehta et al[13], Moorthy et al[12], Banushree et al[15] found maximum cases in lepromatous leprosy. While Alia Rizvi[14] et al found maximum parity in Tuberculoid leprosy. Indicating maximum parity in polar type of leprosy.

CONCLUSION

Leprosy though considered to be eliminated from India, is still prevalent in many areas. Thus, in attempting to eradicate the disease, there is still the necessity to study and research this disease for better understanding the pattern of the disease occurrence and prevalence. Clinical diagnosis of early leprosy lesion is quite difficult because of its clinical diversity, hence histological examination of skin lesion should be done in all leprosy cases.

Histopathological examination remains a gold of standard for diagnosis and subtyping of leprosy cases according to ridley-jopling classification. The sensitivity of detection of acid fast bacilli by histopathological means remains poor, because about 1000 bacilli per cubic centimeter of tissue must be present in order to detect 1 bacillus in a section.

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