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A Study Of Histopathological Spectrum Of Lesions In Leprosy Patients In A Tertiary Care Hospital.

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ABSTRACT :

INTRODUCTION:

Leprosy or Hansen's disease is a chronic granulomatous disorder that is caused by *Mycobacterium leprae*. It mostly affects skin and peripheral nerves. The disease has varied clinical and pathological manifestations depending on the immune response of the patient.

It still remains as a major public health problem facing India. Nearly, 60% of all world leprosy cases are reported from India. The spectrum of presentation of leprosy is very wide.

Histopathology is an important tool, helps in confirming the diagnosis for clinically suspicious cases and helps in exact typing which, in turn, influences treatment plan.

AIMS AND OBJECTIVES:

To study the histopathology of Leprosy cases and identify different Histological subtypes of leprosy at SBKS MIRC sumandeep vidyapeeth , dhiraj hospital, pipariya, waghodiya, vadodara.

METHODOLOGY:

A retrospective hospital-based study of clinically diagnosed leprosy cases was conducted over a period of 3 Years (January 2020 to January 2023).

Lesional skin biopsies obtained were fixed, processed and stained with Haematoxylin and Eosin (H&E) and Fite - Faraco (FF) staining for demonstrating lepra bacilli.

The lesions were classified on microscopy as per Ridley-Jopling classification.

RESULTS:

A total of 100 cases were studied. Highest incidence was in 3rd decade of life.

Males were more affected. Most common clinical feature was loss of sensation. The commonest reported histopathological type was tuberculoid leprosy followed by lepromatous leprosy. The concordance was highest in histoid leprosy, indeterminate leprosy and Type 1 Lepra reaction. Overall FF staining was positive in cases.

CONCLUSION:

The Histopathological examination plays an important role in making definite diagnosis. It still remains the gold standard for early accurate diagnosis and typing of leprosy. Accurate diagnosis is required for proper treatment, preventing deformities and drug resistance. Histopathology also useful for monitoring treatment response.

KEYWORDS:

Leprosy, Histomorphology, skin biopsy, *Mycobacterium leprae*, Hansen's disease

INTRODUCTION

- Leprosy is a chronic granulomatous infection caused by Mycobacterium leprae. It is also known as Hansen's disease. M. leprae commonly affects the skin and peripheral nerves. It can also involve muscles, eyes, bones, testis and internal organs.
- The bacilli are shed from nose, upper respiratory tract, and skin.
- Leprosy has been declared eliminated (prevalence rate <1/10,000 population) as a public health problem in our country on January 1, 2006, still cases are being reported with varying prevalence in various states of our country.
- Physical disabilities caused due to leprosy often evoke severe social stigma that leads to prejudice against patients and their families. Clinical presentation, disabilities associated with the disease and its management differs in different types of leprosy.
- It has different histopathological forms depending on the immunity of the patient.
- 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 factors.
- Indeterminate forms include types that do not fit into any of the five categories. Histoid leprosy is an uncommon type of LL that shows nodules or plaques over apparently normal skin.
- we conduct histopathological examination of various types of leprosy to study the distribution of various types of leprosy within the disease spectrum, to evaluate frequency in relation with the age and gender, and to correlate with clinical presentation of the disease.

MATERIALS AND METHODS

- The Department of Pathology at SBKS MIRC DHIRAJ HOSPITAL , WAGHODIYA , VADODARA, received 150 skin biopsies over a period of 3 years, from January 2020 to January 2023, skin biopsies of 41 patients diagnosed with leprosy were included in our study.
- The skin biopsies were fixed in 10% formalin and then they 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 (H&E) and Fite-Faraco (FF) stain whenever necessary for demonstrating lepra bacilli.
- Histopathologically confirmed cases of leprosy were then divided according to Ridley and Jopling classification, into tuberculoid (TT), borderline tuberculoid (BT), midborderline (BB), borderline lepromatous (BL), and lepromatous leprosy (LL).
- Skin biopsies with morphological features suggestive of other subtypes of leprosy such as indeterminate leprosy (IL), histoid leprosy (HL), Type 1 lepra reaction, and erythema nodosum leprosum (ENL) (Type 2 lepra reaction, ENL) were also reported and included in the study.

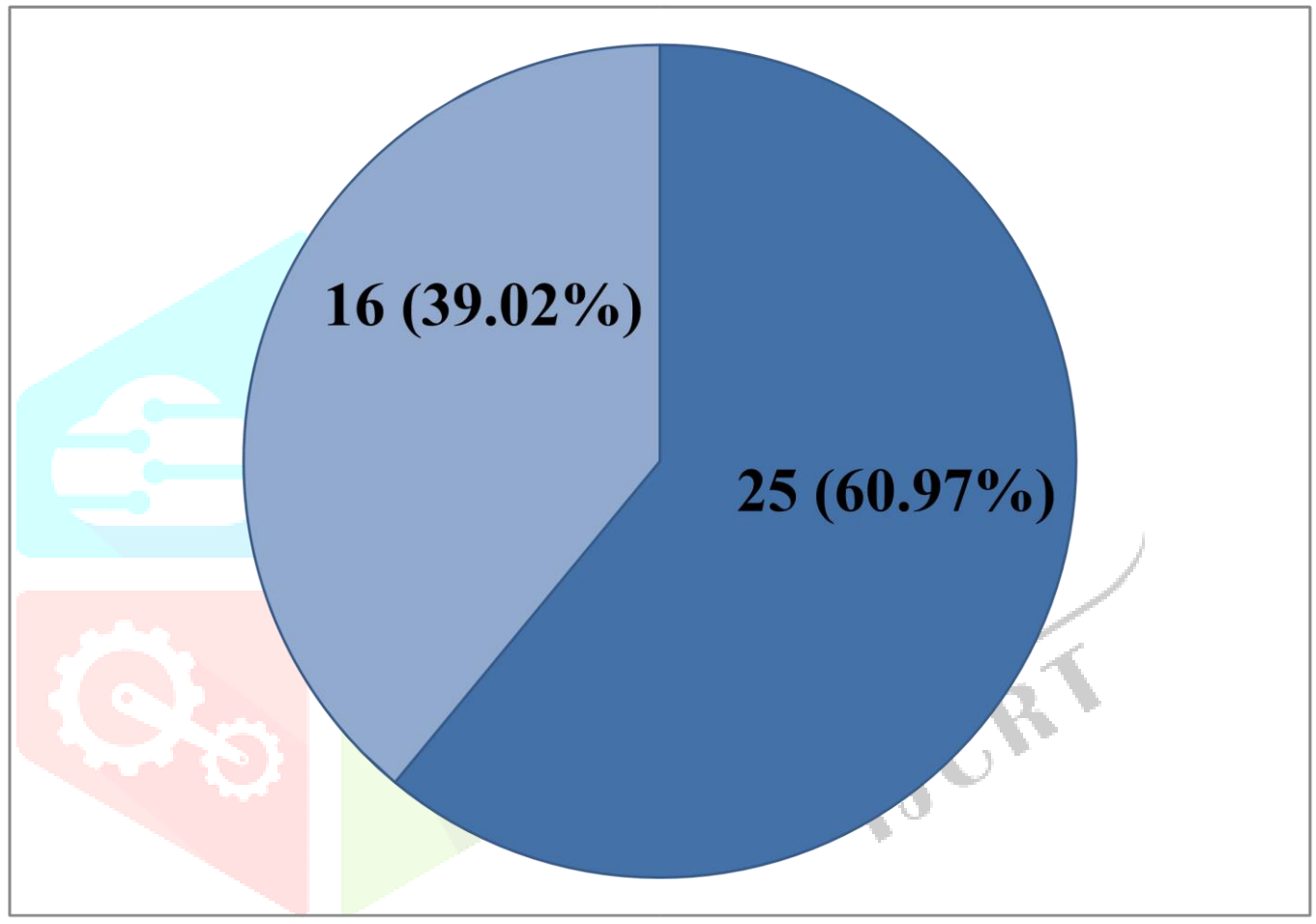
RESULTS

- This study included a total of 41 skin biopsies received from dermatology department and reported as leprosy on histopathological examination.
- The age of the patients varied from 11 years to 80 years with mean age of 32.64 years. The **peak incidence was in 21–30 years (41.46%) of age** followed by (21.95%)incidence in 31– 40 years of age. The least affected were those in the age group of 71–80 years (2.44%) [Table 1].

Age group(in years)	Number of cases (n = 41) (%)
11–20	04 (9.75)
21–30	**17 (41.46)**
31–40	09 (21.95)
41–50	05 (12.20)
51–60	03 (7.32)
61–70	02 (4.88)

71–80	01 (2.44)

Of the 41 cases, 25 cases (60.97%) were males and 16 cases (39.02%) were females with male-to female ratio of 1.56:1 indicating a male preponderance [Figure 1].



Sex distribution [Figure 1]

On histopathological study of all the 41 study cases, Tuberculoid leprosy (TT) with 8 cases

(19.51%) was found to be most dominant group followed by LL leprosy and ENL with 7 cases (17.07%) of each [Table 2].

Etiology	Number of cases (%)
TT leprosy	**8 (19.51)**
BT leprosy	6 (14.63)
BB leprosy	2 (4.88)
BL leprosy	2 (4.88)
LL leprosy	7 (17.07)
IL	4 (9.76)
Type 1 reaction	3 (7.32)
ENL	7 (17.07)
HL	2 (4.88)

TT: Tuberculoid, BT: Borderline tuberculoid, BB: Midborderline, BL: Borderline lepromatous, LL: Lepromatous leprosy, HL: Histoid leprosy, IL: Indeterminate leprosy, ENL: Erythema nodosumleprosum

All skin biopsies of 41 leprosy cases were subjected to Fite-Faraco stain, 19 cases (41.46%) were positive for acidfast bacilli. BL, LL leprosy, and HL showed 100% positivity, while ENL showed 71.42% Fite-Faraco positivity [Table 3].

Type	Number of cases	Number of FF positive Cases (%)
TT	8	1 (12.5)
BT	6	0 (00)
BB	2	0 (00)
BL	**2**	**2 (100)**
LL	**7**	**7 (100)**
HL	**2**	**2 (100)**
IL	4	0 (00)
Type 1 reaction	3	2 (66.67)
ENL	7	5 (71.42)

TT: Tuberculoid, BT: Borderline tuberculoid, BB: Midborderline, BL: Borderline lepromatous, LL: Lepromatous leprosy, HL: Histoid leprosy, IL: Indeterminate leprosy, ENL: Erythema nodosumleprosum

Grading of Bacillary load according to Bacillary Index criteria

Grade	Bacilli
1+	1-10 bacilli in 100 OIF
2+	1-10 bacilli in 10 OIF
3+	1-10 bacilli in 1 OIF
4+	10-100 bacilli in 1 OIF
5+	100-1000 bacilli in 1 OIF
6+	≥1000 bacilli in 1 OIF

Bacillary index (BI) was 0–1 in the TT leprosy cases while in LL leprosy it was three or >3. BI in type 1 lepra reaction ranged from 0 to 3, whereas in most of the type 2 lepra reactions, it was four or >4 [Table 4].

BI	IL	TT	BT	BB	BL	LL	
0	4	7	6	1	-	-	
1+	-	1	-	-	-	-	
2+	-	-	-	-	-	-	
3+	-	-	-	-	-	2	
4+	-	-	-	-	2	2	
5+	-	-	-	-	-	-	
6+	-	-	-	-	-	3	
Inconclusive	-	-	-	1	-	-	
Total	4	8	6	2	2	7	

The most common presenting complaint was a hypopigmented macule (41.46%) followed by nodules (29.26%). The extremities were affected most commonly (46.34%) [Table 5].

Type of skin lesion	Number of cases
Hypo pigmented macule	17
Nodules	12
Plaque	6
Hyperpigmented patch	2
Others	4

DISCUSSION

- Leprosy is a chronic dermal granulomatous condition caused by *M. leprae*. This disease has different clinical and histopathological presentations based on the immune status of the host.

- This was a retrospective study of 41 skin biopsies diagnosed as leprosy on histopathological examination in Department of Pathology at **SBKS MIRC DHIRAJ HOSPITAL , WAGHODIYA , VADODARA** In the present study, spectrum of patients with leprosy ranged from 11 to 80 years with a **mean age of 32.64** years which was concordant with studies done by Kumar *etal*.[5] (40.1 years) and Tiwari *etal*.[6] (32.66 years).

- **Maximum frequency** (41.46%) was found in the age group of **21–30 years** which was comparable to the results of Kumar *et al*., Mathur *et al*., and Manandhar *et al*. while our findings contrasted with Nadia *et al*.(Dehradun) who reported maximum cases in the age group of 31–40 years. This could be due to better health-care facilities in our area, leading to early diagnosis compared to Dehradun.

- Incidence in younger age group could be due to the endemic nature of leprosy.

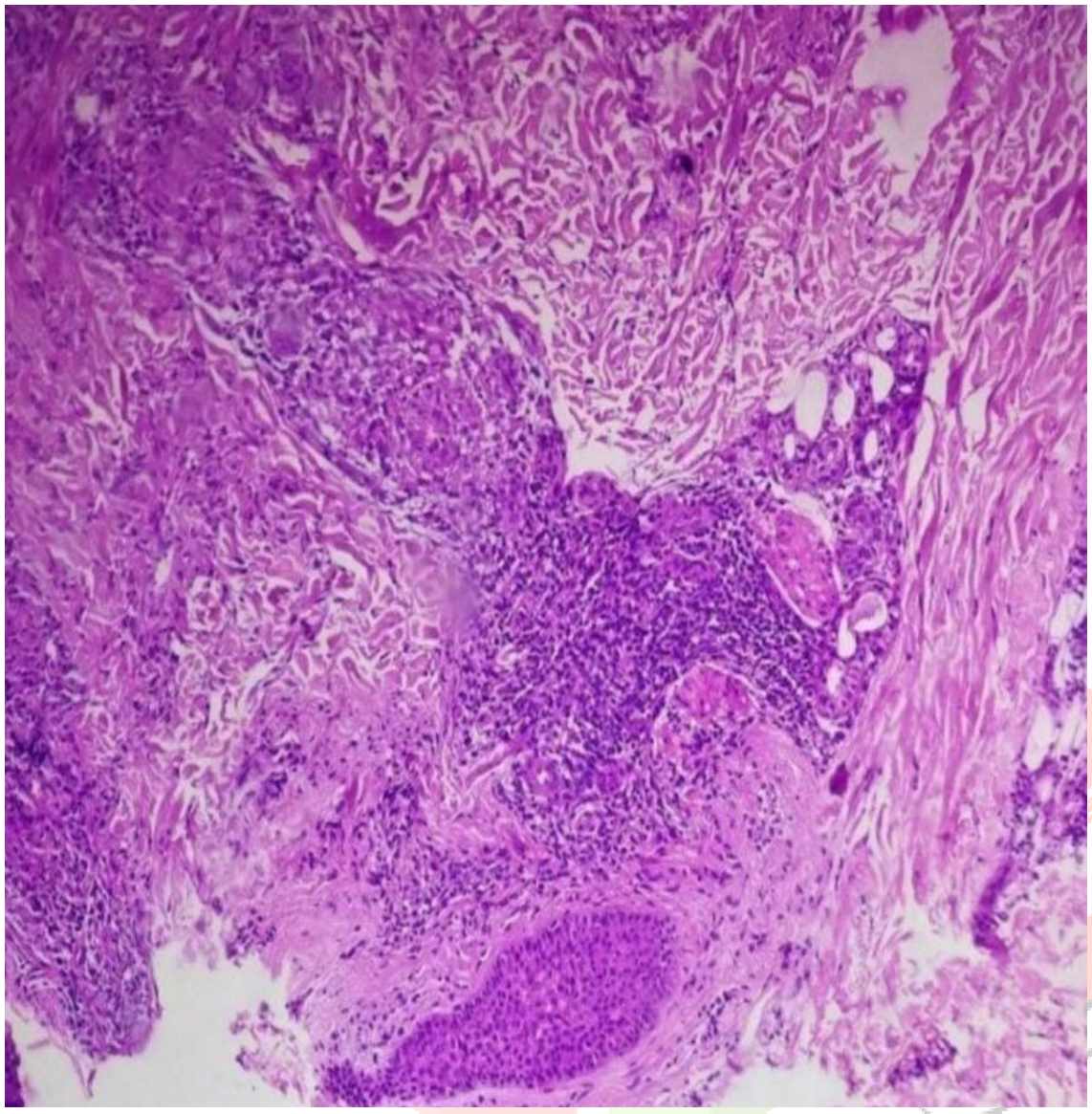
- The male preponderance observed in the present study (1.56:1) is similar to studies done by Tiwari *etal*. (1.4:1), Nadia *etal*.(1.8:1), and Taviyad *etal*.(1.75:1). Sindhushree and Vernekar, Kumar *etal*., and Manandhar *etal*. also reported male preponderance; however, in these studies, the ratio was higher ranging from 2.2 to 3:1.

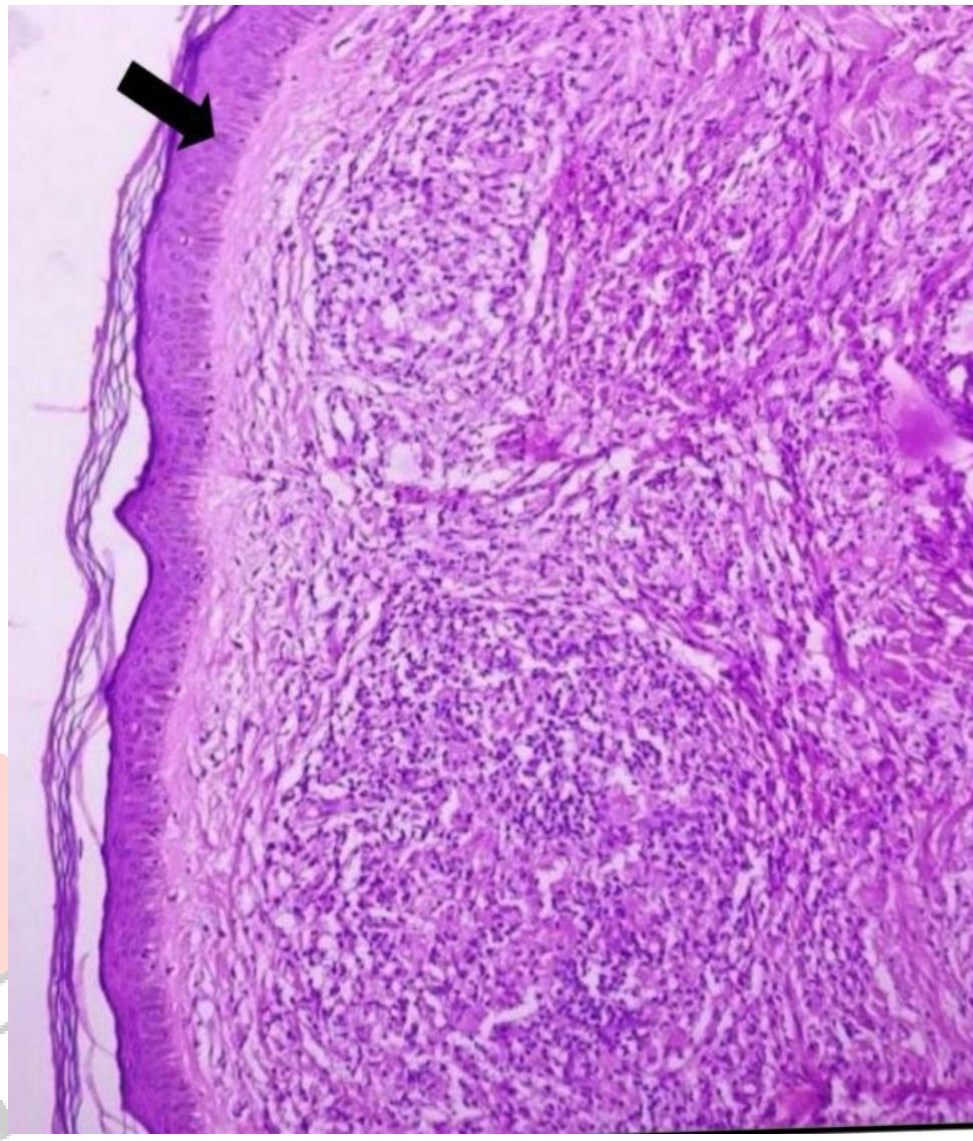
- The male majority has been attributed to more chance of contact in males due to occupation, and social inhibition and occupational factors regarding less reporting of cases in females in India.

- Tuberculoid leprosy (TT) was the most common type of leprosy in our study which was concordant with the study done by Mathur *etal*. In our study, LL leprosy and ENL were the second most common cause. The frequency of LL was much higher compared to Tiwari *etal*. (3.8%) and Kumar *etal*. (9.9%) while it was comparable to Nadia *etal*. and Mathur*etal*. The frequency of ENL in our study was similar to the results of Kumar *etal*.

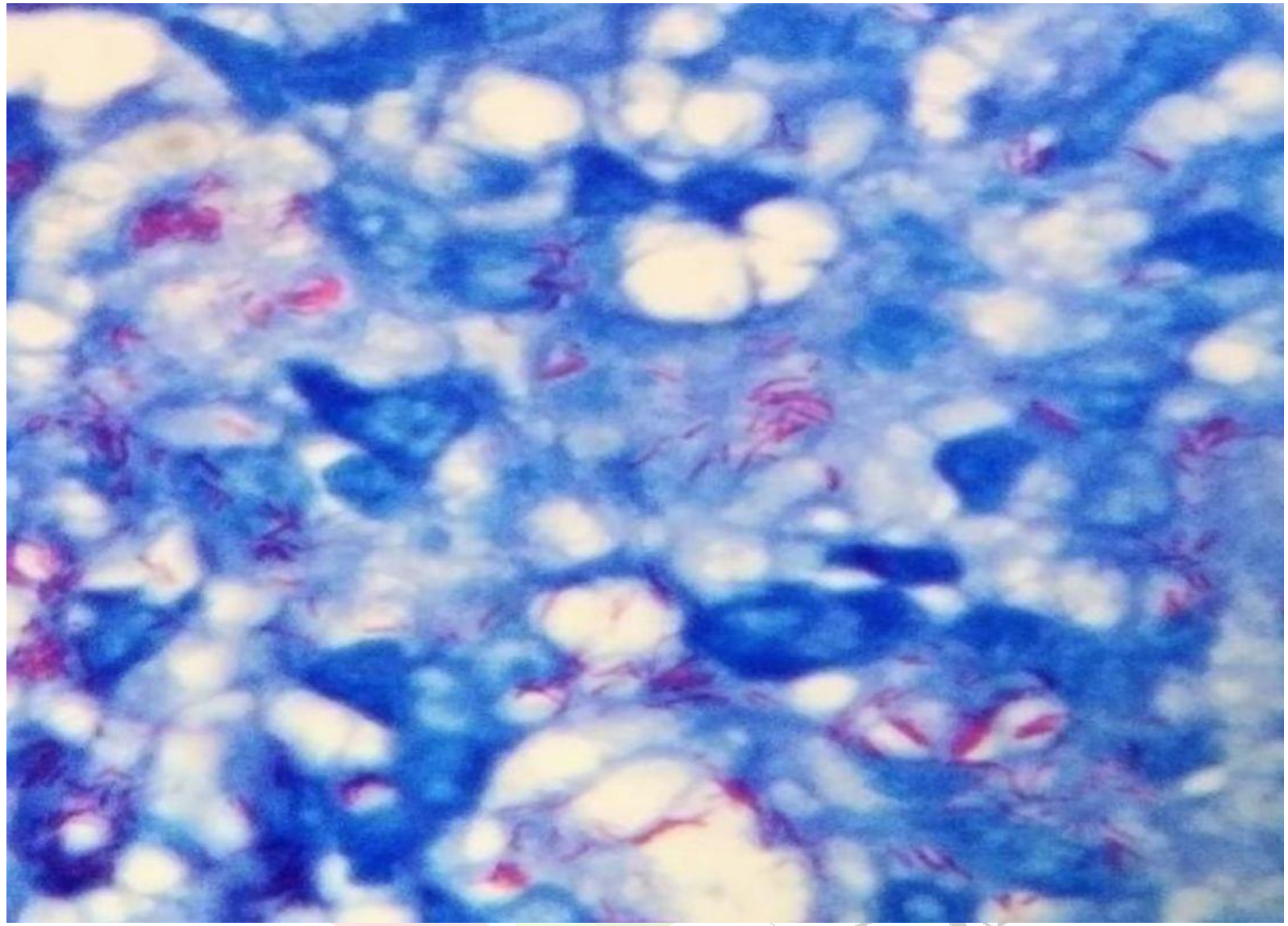
- This might be due to increased occurrence of leprosy (0.98/10,000) in Gujarat in comparison to other regions, as LL leprosy cases that have high infectivity are more common in Gujarat including the area of our study.

- LL type shows flattened epidermis with dermis in TT leprosy shows heavy characteristic grenz zone (black arrow) infiltration of nerve and hair follicle by and no granulomas but diffuse cellular lymphocytes and histiocytes , inflammatory infiltrate and foamy macrophages.





Numerous acid-fast lepra bacilli seen in a case of LL leprosy (Fite-Faraco x100).



CONCLUSION

- Histopathological examination of skin lesions is a crucial method and the gold standard for accurate diagnosis and typing of leprosy.
- Combined with Fite staining, it is very important in cases where insufficient clinical history is available, in early/ borderline/ indeterminate/histoid cases which may not have characteristic clinical signs and show overlapping. It is also helpful in cases where patients may not have anaesthetic patches, especially on the face, and those with vague erythematous nodules or papules where leprosy is suspected.
- Biopsy is a minimally invasive and easy method as well. Thus, histopathology and demonstration of acid fast lepra bacilli is recommended in all cases of leprosy for a good clinicopathological correlation and diagnostic accuracy, which would ultimately help in the prognosis and line of treatment of the patient.

REFERENCES

- Kumar B, Kar HK. IAL Textbook of Leprosy. 2nd ed. New Delhi: JaypeeBrthersMedical Publishers Ltd.;2016.
- NLEP Progress Report for the year 2015-16, Central Leprosy Division Directorate General of Health Services NirmanBhavan, New Delhi: 2016.
- Hastings RC, Gillis TP, Krahenbuhl JL, Franzblau SG. Leprosy. ClinMicrobiol Rev 1988;1:330-48.
- Almeida JO. Serology in leprosy. Bull World Health Organ 1970;42:673-702.
- Kumar A, Negi SR, Vaishnav K. A study of clinicohistopathological correlation of leprosy in a tertiary care hospital in Western district of Rajasthan. J Res Med Dent Sci 2017;2:43-8.
- Tiwari M, Ranabhat S, Maharjan S. Clinico-histopathological correlation of leprosy: A retrospective study of skin biopsy specimens in Chitwan medical college. Int J Med Sci Res Pract 2015;2:8-11.
- Mathur MC, Ghimire RB, Shrestha P, Kedia SK.
- Clinicohistopathological correlation in leprosy. Kathmandu Univ Med J (KUMJ) 2011;9:248-51.
- Manandhar U, Adhikari RC, Sayami G. Clinicohistopathological correlation of skin biopsies in leprosy. J Pathol Nepal 2013;3:452-8.
- Nadia S, Rashmi J, Sohaib A. Clinicopathological correlation of leprosy: A 4 years retrospective study from a tertiary referral centre in north India. Int J Med Res Health Sci 2015;4:350-4.
- Taviyad S, Gandhi S, Purohit M, Purohit T, Dhruva G. A study of leprosy cases: Correlation of clinical features, histopathology and demonstration of lepra bacilli. BJ Kines. Natl J Basic Applied Sci 2017;9:1-7.
- Sindhushree N, Vernekar SS. A study of clinico-histopathological correlation of leprosy in a tertiary care hospital, KIMS, Hubbali, Karnataka. Int J Curr Res Biol Med 2018;3:29-39.
- Jerath VP, Desai SR. Diversities in clinical and histopathological classification of leprosy. Lepr India 1982;54:130-4.
- Kar PK, Arora PN. Clinicopathological study of macular lesions in leprosy. Ind J Lepr 1994;66:435-41.
- Nadkarni NS, Rege VL. Significance of histopathological classification in leprosy. Ind J Lepr 1999;71:325-32.
- Moorthy BN, Kumar P, Chatura KR, Chandrasekhar HR, Basavaraja PK. Histopathological correlation of skin biopsies in leprosy. Ind J DermatolVenereolLeprol 2001;67:299-301.
- Bhatia AS, Katoch K, Narayanan RB, Ramu G, Mukherjee A, Lavania RK. Clinical and histopathological correlation in the classification of leprosy. Int J Lepr 1993;61:433-8.
- Kalla G, Salodkar A, Kachhawa D. Clinical and histopathological correlation in leprosy. Int J Lepr Other Mycobact Dis 2000;68:184-5.