

## Clinico-Histopathological Correlation in Hansen's Disease

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### Abstract

**Aim:** The aim of the present study was to perform clinico-histopathological correlation of skin lesions in all patients with a clinical suspicion of Hansen's disease. **Materials and Methods:** A 3 year retrospective study from 2016-2018 was carried out with all the clinically suspected cases of Hansen's disease along with histopathological examination of skin biopsies. **Results:** Out of the 60 cases diagnosed as Hansen's disease, majority belonged to age group 31-40 years with a male preponderance. Most number of cases diagnosed were of Borderline tuberculoid type (24/60). Overall clinico-histopathological correlation was 58.3%. Maximum correlation was evident at the polar ends of the spectrum with a slightly better correlation for lepromatous leprosy (75%). **Conclusion:** Correlation between clinical and histopathological features is required for accurate classification of Hansen's disease. Clinical detection and histopathological diagnosis of borderline lesions remains challenging and hence the need for interpretation along with the clinical findings.

**Keywords:** Hansen's disease, leprosy, histopathology, Ridley-Jopling Classification.

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### INTRODUCTION

Hansen's disease is a chronic, infectious disease caused by *Mycobacterium leprae* which manifests itself in varied clinico-pathological forms, depending upon the host immune status [1]. It is a growing endemic as its elimination is not as straightforward as it seemed [2]. Leprosy continues to be an important public health problem in most parts of Asia including India.

The study of histopathological changes in Hansen's disease has contributed a great deal to understanding of the disease and clinico-pathological correlative studies have provided further insights into the disease, its varied manifestations and complications [1, 3]. A reliable diagnosis hinges around a good histopathological diagnosis and demonstration of acid fast bacilli (AFB) in histopathological sections [3, 4]. Clinical classification gives recognition only to gross appearances of the lesions, while parameters used in histopathological classification are precise taking into account the progression and regression of disease [3].

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. Ridley & Jopling have proposed the classification of leprosy into five groups as Tuberculoid (TT), Borderline tuberculoid (BT), Mid-borderline (BB), Borderline lepromatous (BL) and Lepromatous (LL) [5].

The present study was carried out to assess the concordance between clinical and histopathological diagnosis in cases of leprosy using Ridley-Jopling scale so as to provide a definite diagnosis and early intervention to prevent complications.

### MATERIALS AND METHODS

We undertook a 3-year retrospective clinico-pathological study involving skin biopsies from clinically suspected cases of Hansen's disease at our institute from 2016-2018. Formalin fixed, paraffin embedded punch biopsies were stained with Hematoxylin & Eosin and modified Fite Faraco stain for identification of *Mycobacterium leprae*. All slides

were reviewed and diagnosed based on Ridley Jopling classification. Clinical diagnosis of the cases (as provided by department of Dermatology) was correlated with the results of histopathologic examination.

## RESULTS

The present study included 60 skin biopsies from patients who were clinically suspected with Hansen's disease. The age of the study participants varied from 15-78 years with the maximum number of cases in the age group 31-40 years. (Chart-1) Of these, 42 (70%) were male and 18 (30%) were female patients (Chart-2).

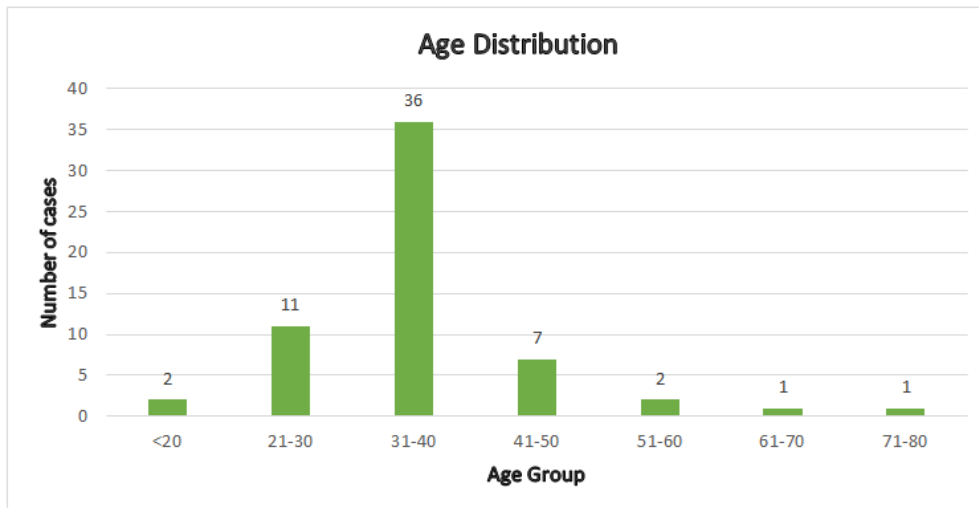


Chart-1: Age distribution of cases

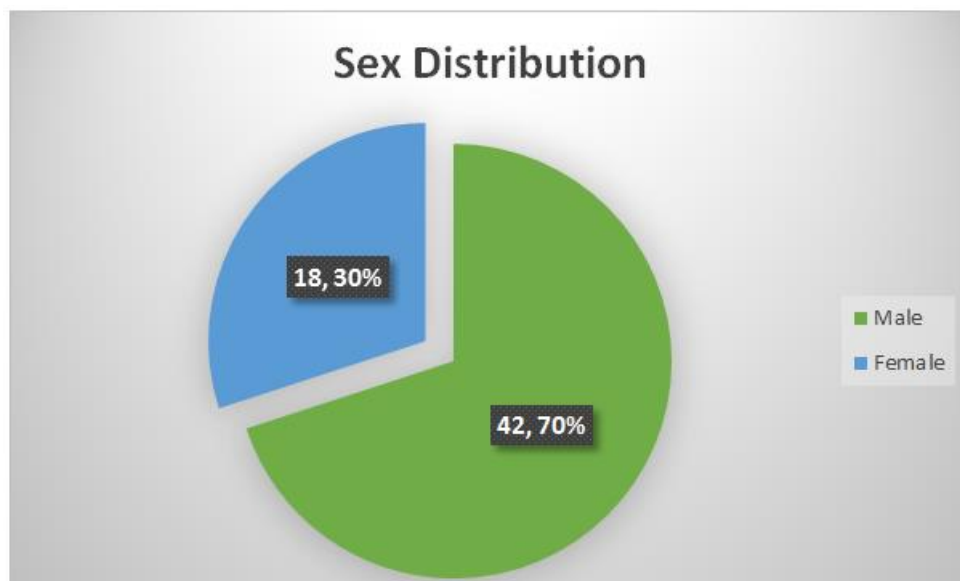


Chart-2: Sex distribution of cases

Out of the 60 cases, a majority were found to be of borderline tuberculoid type (24 cases) accounting for 40% of the cases followed by 21.6% (13 cases) of tuberculoid leprosy. Only one case was of indeterminate leprosy. The distribution of the spectrum of Hansen's disease based on histopathological diagnosis is depicted in Table-1.

The correlation between clinical and histopathological diagnosis is shown in Table-2.

The overall correlation between clinical and histopathological diagnosis was found to be 58.3%.

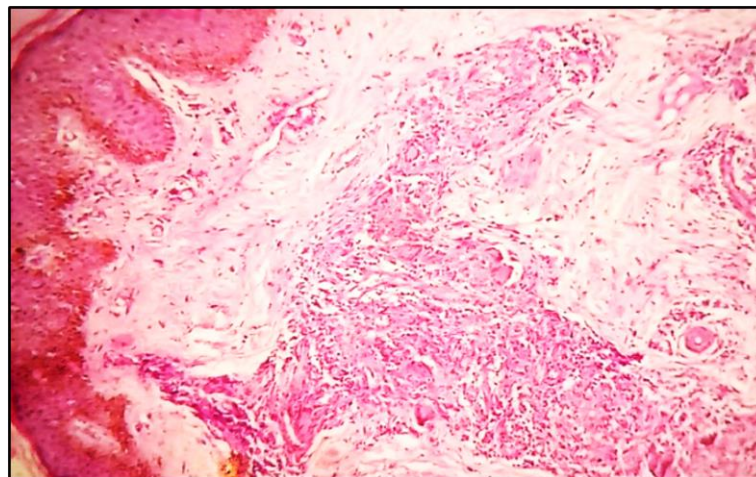
Maximum concordance between the clinical and histopathological diagnosis was seen in lepromatous leprosy followed by tuberculoid leprosy and borderline tuberculoid. There was no correlation in case of indeterminate leprosy.

**Table-1: Histopathological Spectrum of Hansen’s Disease**

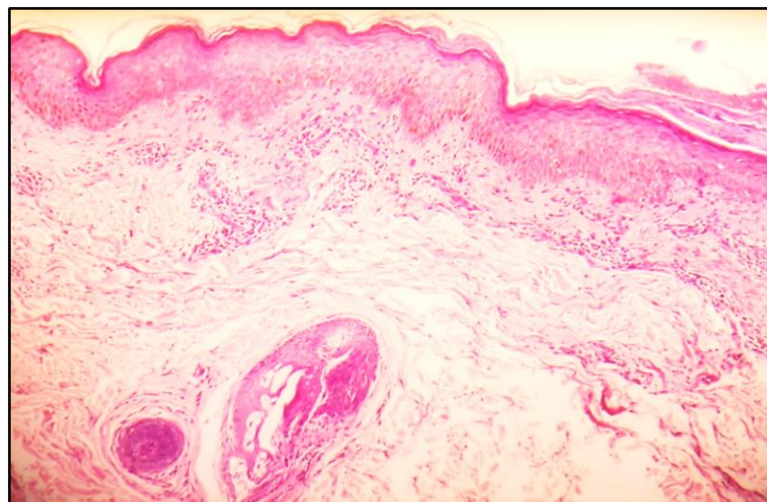
Type	Number	Percentage
Tuberculoid	13	21.6
Borderline tuberculoid	24	40
Mid Borderline	3	5
Borderline lepromatous	11	18.3
Lepromatous	8	13.3
Indeterminate	1	1.6
<b>Total</b>	<b>60</b>	<b>100</b>

**Table-2: Histopathological and Clinical Correlation**

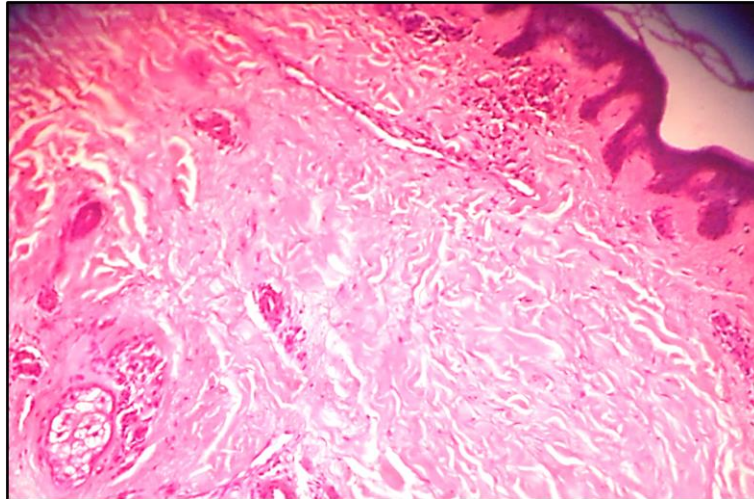
Histopathological Diagnosis	Clinical Diagnosis						Percentage of correlation
	TT	BT	BB	BL	LL	IL	
<b>TT (13)</b>	9	2	1	0	0	1	<b>69.2%</b>
<b>BT (24)</b>	4	15	0	4	1	0	<b>62.5%</b>
<b>BB (3)</b>	0	1	1	1	0	0	<b>33.3%</b>
<b>BL (11)</b>	0	1	1	4	5	0	<b>36.3%</b>
<b>LL (8)</b>	0	1	1	0	6	0	<b>75%</b>
<b>IL (1)</b>	0	1	0	0	0	0	<b>0%</b>
<b>Total (60)</b>	13	21	4	9	12	1	



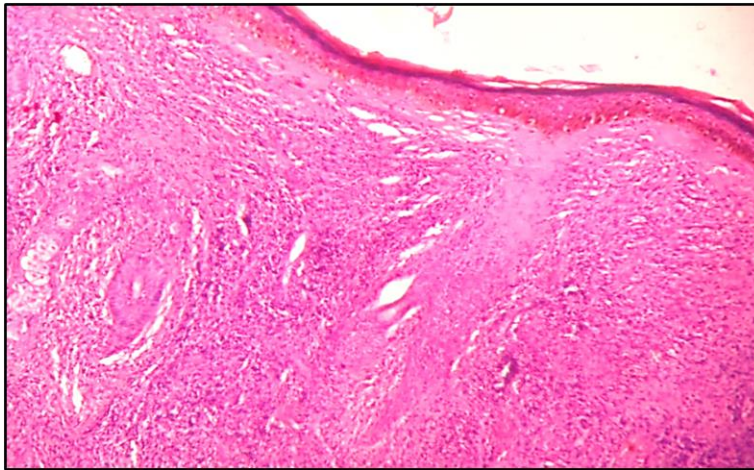
**Fig-1: Tuberculoid Leprosy**



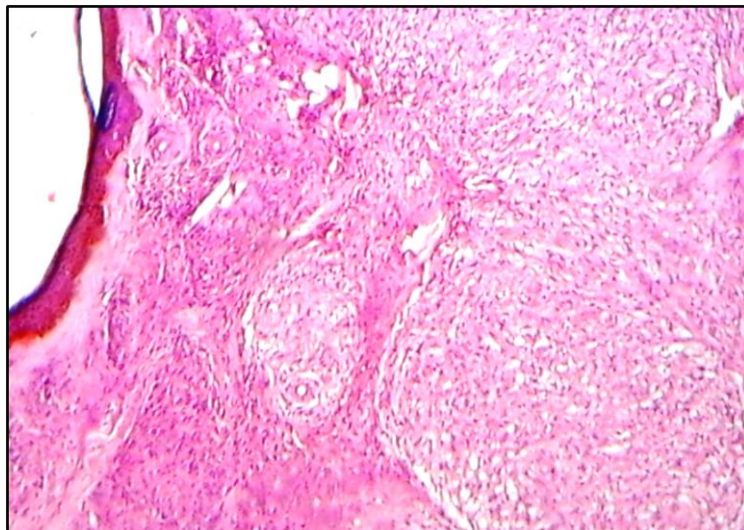
**Fig-2: Borderline Tuberculoid Leprosy**



**Fig-3: Borderline Leprosy**



**Fig-4: Borderline Lepromatous Leprosy**



**Fig-5: Lepromatous Leprosy**

## **DISCUSSION**

Hansen's disease is a slowly progressive, chronic infectious disease which can express itself in

different clinicopathological forms depending on immune status of the host [6]. It primarily affects the skin and the peripheral nerves. It can be progressive and

can cause permanent damage to the skin, nerves, limbs, and eyes [7].

A disease like leprosy needs an appropriate classification because of its varied manifestations. The most commonly accepted classification by research workers is that of Ridley and Jopling [8] which is primarily based on immunity but has been correlated with clinical, histopathological and bacteriological findings.

In the present study, the cases were classified into Tuberculoid (TT), Borderline tuberculoid (BT), Mid-borderline (BB), Borderline lepromatous (BL), Lepromatous (LL) and indeterminate leprosy (IL).

In our study, the maximum number of cases belonged to the age group 31-40 years which is similar to the studies conducted by Sharma *et al.*, [7] and Semwal *et al.*, [9]

The male preponderance noted in our study is in accordance with other studies like Semwal *et al.*, [9] and Moorthy *et al.*, [1] This might be attributed to increased chances of exposure due to job-related mobility [10].

The most common histologic subtype recorded in our study was of Borderline tuberculoid type and is in agreement with Raveneet *et al.*, [3] and Moorthy *et al.*, [1]

According to our study, the most common clinic-histopathological subtype was LL and the least common was IL correlating well with their histopathologies (70%, 0%). Moorthy *et al.*, (80%, 20%) [1], Raveneet *et al.* (80%, 30%) [3] and Shivaswamy *et al.*, [11] observed similar findings in their studies.

It is evident from our study and most of the previously conducted studies that the correlation was better at the polar ends of the spectrum with a slightly better correlation for lepromatous leprosy. This could be attributed to the clearcut clinical presentations at the polar ends.

Since borderline lesions are clinically and immunologically unstable, clinico-histological correlation was not found to be as impressive for cases clinically diagnosed as BT or BL [9].

Indeterminate leprosy did not correlate with the clinical diagnosis in our study. This could be because IL is an early and transitory stage of leprosy found in persons, whose immunological status is yet to be determined and it may progress to one of the other determinate forms of the disease and the clinical manifestations are non specific [1].

Clinico-histological correlation in leprosy is also required for monitoring the response to treatment and for assessing relapse or reactivation of the disease. Although there has been a substantial decrease in the number of leprosy patients after the implementation of MDT for leprosy, we are yet to achieve the goal of leprosy eradication [9, 12].

We will be able to realize our dream of making the world free from the scourge of leprosy, only when all proven cases of Hansen's disease undergo regular follow-up after treatment and are diligently screened before labeling them as disease free.

## CONCLUSION

Correlation between clinical and histopathological features is required for accurate classification of Hansen's disease. Clinical detection and histopathological diagnosis of borderline lesions remains challenging and hence the need for interpretation along with the clinical findings. Since the impact of finding even a single new case of Hansen's disease is huge, such diligence is warranted both by the dermatologist as well as the pathologist.

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