

Clinicohistopathological correlation in leprosy: A study at a rural based tertiary care centre, Gujarat

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Abstract

Context: *Leprosy is a chronic infectious disease involving skin and peripheral nerves. It is present in different clinicopathological forms depending upon immune status of the host. This study has been conducted to know the correlation between clinical and histopathological diagnosis of leprosy. Polar group gives good clinical and histopathological correlation while borderline groups show discordance between clinical and histopathological diagnosis.*

Aims: *To study the clinical and histopathological features in patients of leprosy and to find out the correlation of clinical diagnosis and histopathological diagnosis.*

Setting and Design: *Prospective, Observational.*

Material and Method: *The study was carried out in the department of dermatology at a tertiary care centre of Gujarat for a duration of 3 years from November 2012 to November 2015 after ethical clearance from institutional ethics committee. All the patients who were suspected as leprosy clinically were enrolled in a predesigned proforma after written informed consent and were subjected to histopathological examination.*

Results: *A total of 119 patients were enrolled in which the majority of patients were in the age group of 20-40years 57(47.89%). 77(64.70%) were males and 42(35.29%) were females. Maximum number of patient clinically belonged to tuberculoid leprosy in 31(26.05%) cases. Histologically, tuberculoid leprosy was the most common type in 32(26.89%) cases. Maximum clinicohistopathological correlation was seen in IL (100%) followed by TT (83.87%), BL (63.15%), LL (56.25%), BT (27.58%) and minimum in BB (0%). Overall concordance of diagnosis was seen 53.78%.*

Conclusion: *The histopathological features in leprosy indicate the accurate response of the tissues while the clinical features indicate only the morphological changes due to underlying pathology. Thus, it is logical to expect some disparity between the clinical and histopathological features. The classification of leprosy requires attention to the histopathological criteria and correlation with clinical information so as to facilitate accurate therapy according to proper treatment category and to prevent undesirable complications.*

Keywords: *Leprosy, clinical features, histopathology.*

Key message: *It is sometimes very difficult on clinical grounds to diagnose leprosy due to its varied presentation and it can also mimic various other diseases therefore histopathological examination is needed to confirm diagnosis clinically for proper treatment category and decrease the burden of the disease in the society.*

Introduction

Leprosy, also known as Hansen's disease, is a chronic, infectious disease that primarily affects the skin and the peripheral nerves. Leprosy expresses itself in different clinicopathological forms depending on the immune status of the host^[1,2]. 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. Clinical classification gives recognition only to gross appearances of the lesions, while the parameters used for 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. Histopathology provides confirmatory information for suspect cases

which can be missed in clinical practice or epidemiological studies and helps in exact typing. Histology also gives indication of progression and regression of disease under treatment. The present study was carried out to assess the concordance between clinical and histopathological diagnosis in cases of leprosy using Ridley-Jopling scale.

Materials and Methods

The study was carried out in the department of dermatology at a tertiary care centre of Gujarat for a duration of 3 years from November 2013 to November 2015 after ethical clearance from institutional ethics committee. All the patients who were suspected as leprosy clinically were enrolled in a pre-designed proforma after written informed consent. All were subjected to histopathological examination and split skin smear. Clinical diagnosis of the leprosy cases (as provided by department of Dermatology) using Ridley & Jopling scale was correlated with the results of

histopathologic examination of their respective biopsies.

Results

Total 119 patients were enrolled out of which 77 were males (64.70%) and 42 (35.29%) were females. Most common age group affected was 21-40 years (47.89%) followed by age group 41-60 years (25.21%) [Table 1]. Out of 119 clinically diagnosed cases, 94 were undergone histopathological examination.

Clinically, number of skin lesions were 1-2 in 21 cases (17.64%), 3-10 in 25 cases (21%) and >10 in 73 cases (63.14%) [Table 2]. Symmetry was seen in 29 cases (24.36%) while in 63 cases (52.94%), lesions were asymmetrical. In 29 cases (24.36%), lesions were widespread. Gloves and stocking sensory loss was seen in 63 cases (52.94%) while deformity was present only in 4 cases (3.36%). All the patients were undergone AFB staining in which 52 cases (43.69%) showed positive results.

The distribution of 119 cases on the clinical leprosy spectrum based on Ridley-Jopling scale revealed maximum cases 61 (51.26%) in borderline group (BT {24.36} + BB {10.92} + BL {15.96}). In polar groups, 31 (26.05%) cases belonged to TT and 16 (13.44%) to LL. 6 (5.04%) cases were of ENL, 3

(2.52%) of histoid leprosy, 1 (0.84%) of indeterminate and 1 (0.84%) was inconclusive. No cases were found of type I and pure neural in our study.

Maximum clinico-histopathological correlation was seen in IL (100%) followed by TT (83.87%), BL (63.15%), LL (56.25%), BT (27.58%) and minimum in BB (0%) [Table 3]. Overall concordance of diagnosis was seen 53.78% in our study.

Table 1

Age Group(In Years)	Male	Female	Total(%)
0-20	4	3	7(5.88)
21-40	30	27	57(47.89)
41-60	20	10	30(25.21)
>60	23	2	25(21)
Total(%)	77(64.70)	42(35.29)	119(100)

Table 2

No. of skin lesions	Cases	Percentage
1-2	21	17.64
3-10	25	21
>10	73	61.34

Table 3

Types	Clinical	Histopathological												%
		TT	BT	BB	BL	LL	ENL	T1	PN	I	H	U	ND	
TT	31	26	0	0	0	1	0	0	0	2	0	2	--	83.87
BT	29	2	8	0	7	0	0	1	0	1	0	0	10	27.58
BB	13	1	1	0	0	0	0	0	0	0	0	0	11	0
BL	19	0	2	0	12	0	0	0	0	1	0	0	4	63.15
LL	16	2	1	0	2	9	1	0	0	1	0	0	0	56.25
ENL	6	1	0	0	0	1	4	0	0	0	0	0	--	66.66
I	1	0	0	0	0	0	0	0	0	1	0	0	--	100
H	3	0	0	0	0	0	0	0	0	0	3	0	--	100

TT-TUBERCULOID LEPROSY; BT-BORDERLINE TUBERCULOID; BB-MIDBORDERLINE; BL-BORDERLINE LEPROSY; LL-LEPROMATOUS LEPROSY; ENL-ERYTHEMA NODOSUM LEPROSUM; I-INDETERMINATE; H-HISTOID LEPROSY; U-UNCONCLUSIVE; ND-NOT DEFINED

Discussion

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 which is primarily based on immunity but has been correlated with clinical, histopathological and bacteriological findings. Ridley and Jopling were the first to suggest a subdivision of leprosy on an immunological basis into five types; tuberculoid (TT), borderline tuberculoid (BT), mid borderline (BB), borderline lepromatous (BL) & lepromatous (LL)^[3]. Despite having such an accurate classification, leprosy cases showed so many diversities between the clinical and histopathological features. Clinical spectrum of leprosy cases in the present study revealed maximum cases 61 (51.26%) in borderline group (BT {24.36} + BB {10.92} + BL {15.96}) and similar predominance of cases in borderline group was also observed by Sharma et al^[4].

In the present study the histopathological characteristics were consistent with the clinical diagnosis in 53.78% cases which was consistent with the study done by Sharma et al^[4]. The correlation percentage in other studies were 45.33% in Manandhar et al^[5], 61.8% in Nadia et al^[6], 65% in Shoba et al^[7], 11.26% in Thapa et al^[8] and 20.53% in Dyavannanavar et al^[9] [Table 4].

After excluding indeterminate cases in this study, Tuberculoid leprosy cases seem to present the least problem for classification. Similar highest percentage of agreement between clinical and histopathological diagnoses of tuberculoid leprosy cases is also observed by Thapa et al^[8] and Dyavannanavar et al^[9] in their respective studies. Least agreement was seen in cases of mid borderline leprosy in this study, which is in concordance to the observations recorded by Manandhar et al^[5], Thapa et al^[8] and Dyavannanavar et al^[9] [Table 5]. Mid border line leprosy is immunologically the least stable and variety of clinical lesions of different morphology may be found in the same patient. It is therefore necessary to relate the histological features with the clinical characteristics presented by the particular morphological lesion subjected to biopsy. If this is done carefully, it may be possible to achieve a better correlation of clinical with

the histological changes. Better clinico-histopathological correlation was seen towards the polar groups. Similar rise in clinico-histopathological concordance of tuberculoid group and lepromatous group was also noted by Sharma et al^[4]. Tuberculoid and borderline tuberculoid leprosy often overlap clinically, histologically and immunologically but differ only in degree and same is true for borderline lepromatous and lepromatous leprosy.

Table 4

Various studies	Concordance percentage
Our study	53.78
Shoba et al	65
Nadia et al	61.8
Sharma et al	53.44
Manandhar et al	45.33
Dyavannanavar et al	20.53
Thapa et al	11.26

Table 5

Correlation %	Our study	Nadia et al.	Sharma et al.	Shoba et al.	Manandhar et al.	Thapa et al.	Dyavannanavar et al
TT	83.87	72.7	47.37	42.85	24	66.6	66.6
BT	27.58	65.4	53.01	64.28	63.15	42.9	56.2
BB	0	50	37.35	55.55	0	0	0
BL	63.15	18.7	58.82	70	57.14	0	0
LL	56.25	79.2	75.86	78.57	57.14	16.7	12.5
I	100	0	100	81.81	0	0	0

Conclusion

The histopathological features in leprosy indicate the accurate response of the tissues while the clinical features indicate only the morphological change due to underlying pathology. Thus, it is logical to expect some disparity between the clinical and histopathological features. Correlation of clinical and histopathological features is recommended for accurate typing and therapy to decrease the morbidity amongst leprosy patients and their relatives.

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