ORIGINAL ARTICLE

28 CLINICO-HISTOPATHOLOGICAL STUDY OF LEPROSY PATIENTS A TERTIARY CARE HOSPITAL BASED STUDY. AUTHORS DR. MOXDA S PATEL[*], DR. NIDHI D. PATEL[**], DR. PAYAL N. PADALIYA[**], DR. JAYASHREE M. SHAH[***]

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ABSTRACT

Background and Objectives: Leprosy is a chronic infectious disease caused by Mycobacterium leprae involving skin and peripheral nerves. Depending upon the immune status of the patients there are different clinico-pathological presentation. Despite having been declared eliminated in December 2005 from India as a public health problem, the prevalence of leprosy exceeds 1/10000 population in certain districts/states of India. According to 4th World Health Organization report, India accounts for 60% of the world's new leprosy cases. This is due to stoppage of active surveillance after reaching elimination levels. A spurt in its prevalence motivated us to carry out the study. Our aim is to diagnose and typing of leprosy by histopathology and to correlate the clinical and histopathological diagnosis as per Ridley-Jopling Scale to facilitate accurate therapy. **Material and methods:** The prospective study was carried out in the pathology department of AMC MET Medical College, L.G. Hospital, Maninagar, Gujarat form January 2016 to December 2017, after ethical clearance from institutional ethics committee. All the punch biopsy specimens of suspected patients of leprosy were subjected to histopathological examination. **Result:** A total of 90 cases were studied. Among the clinically suspected cases 67 were positive for leprosy. Male to female ratio was 3.5:1, the age ranged from 4 to 80 years. Maximum cases were classified as borderline lepromatous leprosy (22) and least cases of midboderline leprosy (2) and indeterminant leprosy (2). Maximum clinico-histopathological correlation was seen in tuberculoid leprosy (100%) and indeterminant leprosy (100%). **Conclusion:** Combining clinical, histopathological and microbiological diagnosis of leprosy is important for proper treatment of the patient and prevention of complications.

Keywords: Histopathology, Leprosy, Ridley-Jopling classification.

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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 nerves[1]. It can also involve muscles, eyes, bones, testis and internal organs[2]. Leprosy can cause various physical and psychological disabilities, due to which it is considered as one of the most feared and stigmatizing disease[3]. As per the latest available data from the World Health Organization, 57.8% of the new leprosy cases detected globally in 2012 happened to be from India[4]. Despite having been declared eliminated in December 2005 from India as a public health problem, leprosy continues to retain a prevalence rate (PR) higher than1/10,000 population in parts of the country, namely, Dadar and Nagar Haveli (3.61), Chhattisgarh (2.13), Bihar(1.20), Maharashtra (1.09), and West Bengal (1.05)[5].

Ridley and Jopling (RJ) proposed a histological classification scheme for leprosy in 1960's, that includes early indeterminant leprosy (IL), polar tuberculoid leprosy (TT), borderline tuberculoid leprosy (BT), mid-borderline leprosy (BB), borderline lepromatous leprosy (BL), and polar lepromatous leprosy (LL)[6]. The present cornerstone of stratergy for leprosy control emphasizes early detection and adequate treatment of cases, so as to break the chain of infection[7]. So we evaluated the histopathological features of cases diagnosed as leprosy on clinical examination and also to assess the applicability of the Ridley-Jopling (RJ) system of classification in the current era of decreasing disease prevalence by correlating the clinical and the histopathological features[8,9].The accurate histopathological response of the tissues correlated with gross clinical morphology increases the diagnostic accuracy not only of the cases suspected clinically but also of a variety of unrelated diseases mimicking the protean manifestations of leprosy. Interaction between pathologist and dermatologist may be beneficial for proper diagnosis and management of the patient[10].

In 1982, World Health Organization (WHO) recommended the use of two different regimens of multidrug therapy for the treatment of leprosy on the basis of the RJ classification. According to this, IL, TT, and BT cases of leprosy are included in paucibacillary (PB) treatment regimen, and BB, BL, and LL cases of leprosy are included in multibacillary (MB) treatment regimen[11]. Similarly, a BI value ≥ 2 at any skin site is considered as MB leprosy and a BI value <2 as PB leprosy. WHO has also recommended the method of counting skin lesions to determine treatment modality (PB leprosy, $\leq$5lesions; MB leprosy, >5 lesions)[12].

MATERIAL AND METHODS

The prospective study was carried out in the pathology department of AMC MET Medical College, L.G. Hospital, Maninagar, Gujarat form January 2016 to December 2017 after ethical clearance from institutional ethics committee. All the punch biopsy specimens of suspected patients of leprosy were subjected to histopathological examination. Their age, sex and clinical findings were recorded on a proforma. In all cases, punch biopsies were stained by Hematoxylin and Eosin stain and 5% Ziehl-Neelsen stain for morphological assessment and identification of the lepra bacilli respectively and grouped histopathologically as per Ridley-Jopling Scale. Subsequently a clinico-histopathological correlation was done.

RESULT

Table 1 – Distribution of leprosy cases according to age and sex.

Age (years)	Male		Female		Total
	POSITIVE	NEGATIVE	POSITIVE	NEGATIVE	
0 – 10	1	1	0	0	2
11 – 20	10	4	1	0	15

21 – 30	**20**	**4**	**7**	**3**	**34**
31 – 40	**11**	**2**	**2**	**0**	**15**
41 – 50	**4**	**5**	**3**	**0**	**12**
51 – 60	**2**	**2**	**1**	**0**	**5**
>61	**4**	**2**	**1**	**0**	**7**
Total	**52**	**20**	**15**	**3**	**90**

The study was carried out on skin biopsies of 90 clinically diagnosed untreated cases of leprosy of which 72 were males and 18 were females. The age ranges from 4 to 80 years with the majority of them in the age group of 21 to 30 years (Table-1).

Table 2- Distribution of Leprosy cases according to Histological types.

Histological type of leprosy	No.	%
TT	**7**	**10.44**
BT	**17**	**25.37**
BB	**2**	**2.98**
BL	**22**	**32.53**
LL	**17**	**25.40**
I	**2**	**2.98**
TOTAL	**67**	**100**

Histopathological features of leprosy were observed only in biopsies of 67 cases, while other cases which showed histological features of nonspecific dermatitis or with inadequate biopsies were excluded from clinic-histopathological correlation. The distribution of 67 cases on the clinical leprosy spectrum based on Ridley-Jopling scale revealed maximum cases (61.19%) in borderline group (BT+BB+BL) and least number (2.98%) of cases in indeterminate leprosy (IL) (Table-2).

Table 3- Distribution of Leprosy cases according to Histopathological correlation.

Types of leprosy	Clinical Diagnosis	Histopathological Diagnosis						Correlation with clinical type %
		TT	BT	BB	BL	LL	IL	
TT	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**100**
BT	**26**	**4**	**12**	**0**	**8**	**2**	**0**	**46.15**
BB	**2**	**0**	**0**	**1**	**0**	**1**	**0**	**50**
BL	**12**	**1**	**2**	**1**	**7**	**0**	**1**	**58.33**
LL	**25**	**1**	**3**	**0**	**7**	**14**	**0**	**56**
IL	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**100**
TOTAL	**67**	**7**	**16**	**2**	**22**	**17**	**2**	**53.73**
TT-TUBERCULOID LEPROSY; BT-BORDERLINE TUBERCULOID LEPROSY MIDBORDERLINE LEPROSY;BL-BORDERLINE LEPROMATOUS LEPROSY; LL-LEPROMATOUS LEPROSY; IL-INDETERMINATE LEPROSY								

Maximum clinico-histopathological correlation was seen in TT and IL (100%) followed by BL (58.33%), LL (56%), BB (50%) and BT (46.15%) (Table-3).

Table 4- Comparison with other studies.

Various studies	Concordance percentage
Our study	**53.73**
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**

Overall concordance of diagnosis was seen in 53.73% in our study (Table-4).

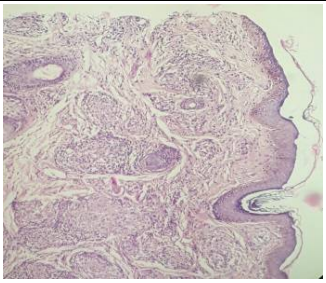

Figure 1a:

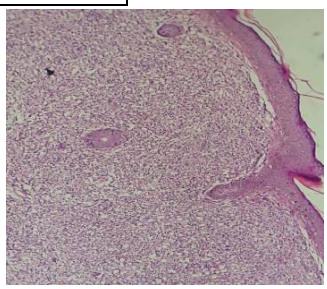

Figure 2a:

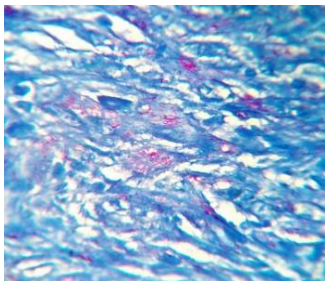

Figure 2b:

Figure 1a: Photomicrograph of skin showing perineural and periadnexal lymphohistiocytic infiltrate (H&E, ×100). **Figure 2a:** Skin biopsy reveals a well defined grenz zone beneath which there are sheets of histiocytes (H&E, ×400). **Figure 2b:** Clusters of acid fast bacilli (Modified Ziehl-Neelson stain, Oil immersion)

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), midborderline (BB), borderline lepromatous (BL) & lepromatous (LL). Despite having such an accurate classification, leprosy cases showed so many diversities between the clinical and histopathological features.

Table 5- Comparison and correlation with other studies.

Correlation %	Our study	Nadia et al.	Sharma et al.	Shoba et al.	Manandhar et al.	Thapa et al.	Dyavannanavar et al
TT	**100**	72.7	47.37	42.85	24	66.6	66.6
BT	**65**	65.4	53.01	64.28	63.15	42.9	56.2

BB	**50**	50	37.35	55.55	0	0	0
BL	**58.33**	18.7	58.82	70	57.14	0	0
LL	**56**	79.2	75.86	78.57	57.14	16.7	12.5
I	**100**	0	100	81.81	0	0	0

In the present study the histopathological characteristics were consistent with the clinical diagnosis in 53.73% cases which was consistent with the study done by Sharma et al[13]. The correlation percentage in other studies were 65% in Shoba et al[14], 61.8% in Nadia et al[15],53.44 in Sharma et al[13],45.33% in Manandhar et al[16], 20.53% in Dyavannanavar et al[17]and 11.26% in Thapa et al[18] (Table-4).

Highest percentage of agreement between clinical and histopathological diagnoses is observed in tuberculoid leprosy which is in concordance to the observations recorded by Nadia et al[15] and with indeterminate cases which is in concordance to the observations recorded by Sharma et al[13]. Borderline lepromatous leprosy is in concordance to the observations recorded by Sharma et al[13] and lepromatous leprosy is in concordance to the observations recorded by Manandhar et al[16] (Table-5). Mid borderline 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.

CONCLUSION

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 clinical diagnosis for proper treatment category and decrease the burden of the disease in the society.

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