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Dr. Shalini J
Assistant Professor, Department of Pathology, Sri Siddhartha Institute of Medical Sciences and Research Center. T. Begur, Nelamangala Taluk, Bangalore Rural, Karnataka, India

Dr. Nischita Budihal
Associate Professor, Department of Pathology, Sri Siddhartha Institute of Medical Sciences and Research Center. T. Begur, Nelamangala Taluk, Bangalore Rural, Karnataka, India

Dr. Veena Thimmappa
Associate Professor, Department of Dermatology, Sri Siddhartha Medical College, Tumkur, Karnataka, India

Corresponding Author:
Dr. Nischita Budihal
Associate Professor, Department of Pathology, Sri Siddhartha Institute of Medical Sciences and Research Center. T. Begur, Nelamangala Taluk, Bangalore Rural, Karnataka, India

Original research article

Clinicopathologic correlation of different types of leprosy lesions

Dr. Shalini J, Dr. Nischita Budihal and Dr. Veena Thimmappa

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Abstract
Background: Leprosy is one of the major public health problems of the developing countries. The principle of reducing the load of infection in society, to break the chain of infection, is the cornerstone of leprosy control work today.
Aim of the Study: To study clinicopathologic correlation of different types of leprosy lesions.
Materials and Methods: The present study was conducted in the Department of Dermatology of the medical institute. The ethical clearance for the study was approved from the ethical committee of the hospital. A total of 90 leprosy skin biopsies were studied over a period of 12 months. All the biopsies were received in the Department of Pathology of the hospital. Cases were selected regardless of their age, sex, socio-economic status and occupation. Biopsies were fixed in 10% formalin and processed. 5 micron sections were stained with haematoxylin and eosin; modified Fite and studied.
Results: There were 65 males and 25 females between 8 and 70 years of age. We observed that borderline tuberculoid leprosy was the most common cases in clinical and histopathological types, although more number of cases were seen in histopathological types of leprosy. We observed that the while correlating the histopathological diagnosis with clinical diagnosis, maximum correlation (75%) was noted in LL patients followed by BT (59%) and BB (50%).
Conclusion: Within the limitations of the present study, it can be concluded that there is some degree of overlap between different types of leprosy, both clinically and histopathologically, correlation of clinical and histopathological features along with bacteriological index appears to be more useful for accurate typing of leprosy than considering any one of the single parameters alone.

Keywords: Leprosy, lesions, tuberculoid leprosy

Introduction

Leprosy is one of the major public health problems of the developing countries. The principle of reducing the load of infection in society, to break the chain of infection, is the cornerstone of leprosy control work today. [1] Clinical judgment and skin smear examination is required for early diagnosis and adequate treatment to make the patient noninfectious. But in some early and borderline cases of leprosy, it is difficult to label only on clinical basis. So, histopathological examination is a must for confirmation of diagnosis in doubtful cases of leprosy. Moreover, correct labeling of paucibacillary and multibacillary cases is a prerequisite. [2, 3] No multibacillary case should be treated as paucibacillary case. So, clinicohistopathological correlation of leprosy cases assumes a pivotal role for early diagnosis and for proper labeling of a case. Ridley and Jopling devised a diagnostic classification of leprosy based on immunopathologic data. Five objective histopathologic criteria form the microscopic basis for classification: granuloma cell type, bacterial load, number and distribution of lymphocytes, pathologic changes in nerves, and the presence or absence of encroachment of the subepidermal Grenz zone and epidermis. [5] Leprosy exhibits a spectrum of clinical characteristics that correlate with the histopathological changes and the immunological status of the individual. At one end of the spectrum is tuberculoid leprosy (TT), which is a highly resistant form with few lesions and a paucity of organisms (paucibacillary leprosy). At the other end is lepromatous leprosy (LL), in which there are numerous lesions with myriad bacilli (multibacillary leprosy) and an associated defective cellular immune response. In between two poles are borderline-tuberculoid (BT), borderline (BB), and borderline lepromatous (BL). [6]

Hence, the present study was conducted to study clinicopathologic correlation of different types of leprosy lesions.

Materials and Methods

The present study was conducted in the Department of Dermatology at Sri Siddhartha Medical College, Tumkur. The ethical clearance for the study was approved from the ethical committee of the hospital. A total of 90 leprosy skin biopsies were studied over a period of 12 months from 2016 to 2017. All the biopsies were received in the Department of Pathology of the hospital. Cases were selected regardless of their age, sex, socio-economic status and occupation. Biopsies were fixed in 10% formalin and processed. 5 micron sections were stained with haematoxylin and eosin; modified Fite and studied.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

Results

There were 65 males and 25 females between 8 and 70 years of age. Table 1 shows clinical and histopathological types of leprosy. We observed that borderline tuberculoid leprosy was the most common cases in clinical and histopathological types, although more number of cases were seen in histopathological types of leprosy. Table 2 shows correlation between clinical and histopathological classification. We observed that the while correlating the histopathological diagnosis with clinical diagnosis, maximum correlation (75%) was noted in LL patients followed by BT (59%) and BB (50%).

Table 1: Clinical and Histopathological types of leprosy

	Number of patients	
Types of leprosy	**Clinical**	**Histopathological**
Tuberculoid leprosy (TT)	11	6
Borderline tuberculoid leprosy (BT)	39	61
Borderline borderline leprosy (BB)	4	2
Borderline lepromatous leprosy (BL)	23	12
Lepromatous leprosy (LL)	8	4
Intermediate leprosy (IL)	5	5
Total	**90**	**90**

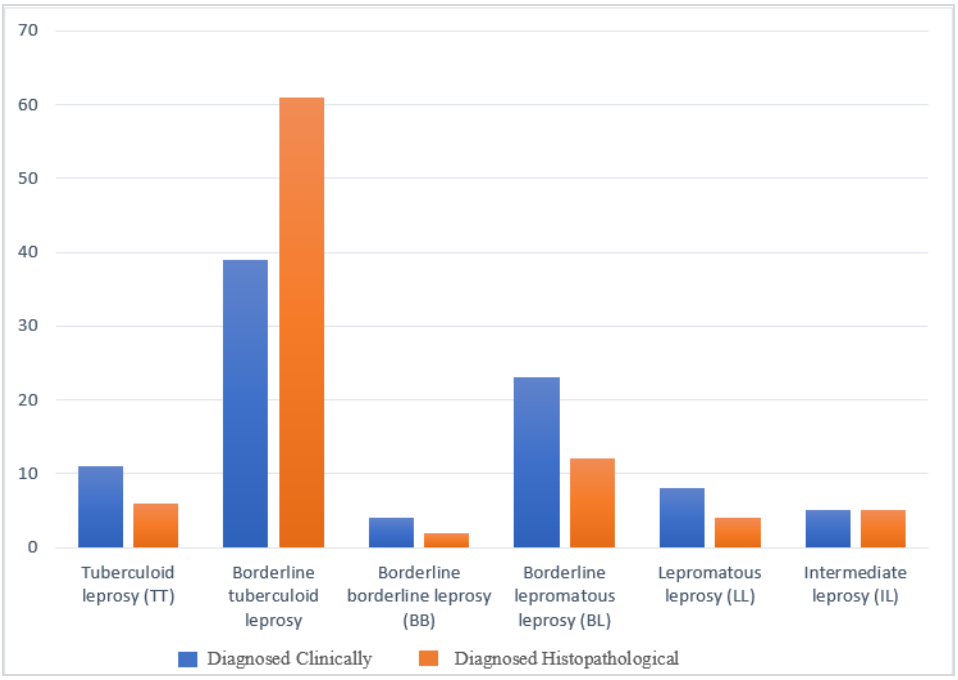

Fig 1: Clinical and Histopathological types of leprosy

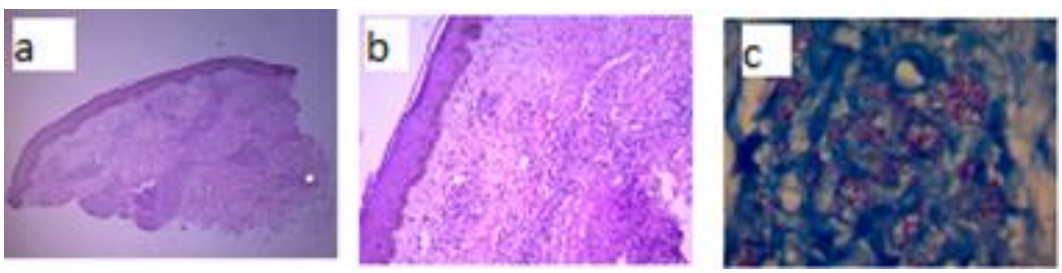

Fig 2: Histological section of Lepromatous Leprosy. (a)H&E, 10x. (b) H & E, 40x, (c) Fite-Faraco, 100x

Table 2: Correlation between clinical and histopathological classification

Histopathological diagnosis	Clinical diagnosis						Percentage of agreement
	TT	BT	BB	BL	LL	IL	
TT (6)	3	2	-	1	1	-	50
BT (61)	5	36	2	15	2	1	59
BB (2)	-	-	1	1	-	-	50
BL (12)	-	1	-	8	3	-	12
LL (4)	2	-	-	1	3	-	75
IL (5)	1	-	1	1	1	1	20
Total (90)	**11**	**39**	**4**	**23**	**8**	**5**	

Discussion

In the present study, we observed that maximum correlation (75%) was noted in LL patients followed by BT (59%) and BB (50%). The results were compared with previous studies and were found to be consistent. Mathur MC *et al* conducted a study where they correlated clinical diagnosis with histopathological diagnosis of leprosy patients in Nepal. A retrospective hospital-based study was conducted among patients with all clinical types of leprosy, classified as per the Ridley-Jopling classification. Skin biopsies were taken from active lesions in all patients and were stained with Hematoxylin and Eosin stain and modified Fite-Feraco stain for identification of Mycobacterium leprae. The histopathological findings were compared with clinical diagnoses. A total 156 patients were studied, out of which 84 (53.8%) males and 72 (46.1%) females between 8 and 86 years of age. The majority of patients 33 (23.57%) were in the age group of 21-30 years and least affected was children below 10 years (0.007%). Overall coincidence of clinical and histopathological diagnoses of classification was seen in 115 cases (80.4%). The maximum correlation (95.2%) was noted in LL patients (p value 0.000049) followed by BT (89.74%), TT (73.2%), BL (72.4%), BB (64.7%). They concluded that leprosy still continues to be one of the common infectious disease in Nepal and skin biopsy is a useful tool in confirming the clinical diagnosis of leprosy as well as for the therapeutic guide. Bhatia AS *et al* reported their observations on the correlation between clinical and histopathological diagnoses of the classification of leprosy. The histopathological classification of leprosy in 1351 cases was done per Ridley-Jopling criteria and was compared with the clinical diagnoses of the same cases. These 1351 cases included 79 cases diagnosed clinically as having a "reaction." However, the histopathologists could not detect any evidence of reaction in 16 of these 79 cases (20%). Of the remaining 1272 cases, 68 (5%) were reported as "no evidence of leprosy" by the histopathologists; 37 of these 68 were found to be from the clinically indeterminate type of leprosy. Histopathological and clinical diagnoses of the classification of leprosy coincided in 69% of the cases. Concordance between the clinical and histopathological diagnoses for different types of leprosy was: indeterminate (I) = 36%, tuberculoid (TT) = 50%, borderline tuberculoid (BT) = 77%, borderline (BB) = 26%, borderline lepromatous (BL) = 43%, and lepromatous (LL) = 91%. When some of the types were combined (BT with TT, BL with LL), the overall concordance figure was 76%; concordance for the TT/BT group was 80%, for the BL/LL group it was 93%. Since both TT and BT are considered paucibacillary and LL or BL are considered multibacillary for treatment purposes, differentiating TT from BT or BL from LL is, perhaps, therapeutically irrelevant. However, for classification purposes it appears that the weight given to different signs and/or histopathological parameters for classifying leprosy cases (especially TT, BB and I) needs to be reassessed. [7, 8]

Nadkarni NS *et al* carried out a retrospective blind study on 2640 patients of leprosy to correlate the histopathological and clinical classification of leprosy using the criteria laid down by Ridley and Jopling. There was complete agreement between histopathological and clinical classification in 81.8% of the cases, with one step deviation in 5.1% of the cases. Histopathological diagnosis of indeterminate leprosy in high percentage (15.9%) as against 3.3% of indeterminate leprosy clinically in our series was an interesting feature. Type-wise correlation between histopathological with clinical classification was very high, it being the highest in LL (98%) followed by TT (97%), BT, BB and BL (95%, 89% and 87% respectively). Shivaswamy KN *et al* carried out a study on 182 suspected cases of leprosy. Of the 182 suspected cases of leprosy which were biopsied, the clinical diagnosis was TT in 32 (17.5%), BT in 70 (38.4%), BB in 5(2.7%), BL in 24 (13.1%), LL in 23 (12.6%), and indeterminate in 28 (15.3%) cases. Of the 182 cases, which were biopsied, only 136 (74.7%) showed histological features consistent with any one type of leprosy. The overall clinicohistological correlation was 74.7 percent. A comparison of the histopathological pattern with that of clinical pattern revealed that the maximum correlation was seen with LL (84.2%), followed by BL (73.3%), BT (64.1%), TT (56%), BB, and IL (50%). They concluded that there is some degree of overlap in different types of leprosy, especially the unstable forms, thus, the correlation can be made more accurate by combining clinical and histopathological features. [9, 10]

Conclusion

Within the limitations of the present study, it can be concluded that there is some degree of overlap between different types of leprosy, both clinically and histopathologically, correlation of clinical and histopathological features along with bacteriological index appears to be more useful for accurate typing of leprosy than considering any one of the single parameters alone.

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