Clinico Histopathological Correlation in Leprosy

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Abstract:
Introduction: *Leprosy is a chronic, infectious disease caused by Mycobacterium leprae. It is classified into five groups based on clinical, histological, microbiological and immunological criteria (Ridley & Jopling Classification). However a great variation is seen in interpretation of clinical and histopathological examination of these lesions. The present research was taken to study the correlations between the clinical and histological diagnosis and to evaluate the importance of skin biopsy as an important diagnostic and spectrum defining tool.*
Methodology*: A retrospective Hospital-based study was conducted in patients of Leprosy, who attended Dermatology Out Patient Department for a period of 18 months. Clinical diagnosis was noted and the biopsies were processed as per standard protocol in the Department of Pathology. The clinical and histopathological concordance was calculated using percentage parity.*
Results & Conclusion*: In a total of 50 cases, 28 (56%) males and 22 (44%) females .The histopathological diagnoses from our study showed agreement with clinical diagnoses in 25 (50%) cases. The maximum concordance of 80% was seen in LL cases followed by TT (57%), BT(53.33%), IDL (50%), BL (33.33%) and major discordance was observed in BB(14.29%) cases.*
Keywords: *clinico-histopathological, mycobacterium leprae, fite faraco, acid fast bacilli, granulomas*

I. Introduction

Leprosy is a chronic, infectious disease caused by Mycobacterium Leprae presses itself in different clinico-pathological forms, depending on the immune status of the host.[1] Before confirming a case of Leprosy of particular type, the clinical features should be correlated and confirmed with histological examination along with bacteriological index and start the multidrug treatment.[2] The disease spectrum has been characterised in a number of classification systems, most widely being the Ridley-Jopling classification. In this classification, leprosy has been divided into five groups as Tuberculoid (TT), Borderline tuberculoid(BT),Mid-borderline (BB), Borderline Lepromatous(BL), and Lepromatous (LL).[3]Though the clinical diagnosis is based on characteristic skin lesions with sensory loss, a great variation is seen in interpretation of these lesions, both clinically and histopathologically. [4] The current study was undertaken to correlate different clinical types of leprosy and histopathology of skin biopsies.

II. Materials And Methods

A retrospective Hospital-based study was conducted in 50 patients of Leprosy, who attended Dermatology Out Patient Department, Father Muller Medical College Hospital, Mangalore between December 2014 and May 2016 (i.e., 18 months). The spectrum of the disease is diagnosed clinically and graded into Tuberculoid Type (TT), Borderline Tuberculoid (BT), Mid-borderline (BB), Borderline Lepromatous (BL), Lepromatous Leprosy (LL) and Indeterminate type (IDL) as per Ridley-Jopling classification which is accepted worldwide.8 Cases were selected regardless of their age, sex, socioeconomic status and occupation. Patients already treated with anti-leprosy medications in any time earlier were excluded. Skin biopsies were taken from active lesions in all patients after taking informed consent and approval from institutional ethical committee and biopsies were processed as per standard protocol in Department of Pathology. They were stained by Hematoxylin & Eosin stain. AFB were demonstrated using Fite Faraco stain. The clinical and histopathological correlation was calculated using percentage parity.

Statistical Analysis
Statistical analysis is done using range, frequency, percentage, chi square test.

III. Results

The study group consisted of total 50 patients, out of which 28 (56%) males and 22 (44%) females between 8 and 86 years of age.(Table 2). The age group of the patients ranged from 10 years to 74 years. The majority of the cases belonged to the age group of 31-50 years i.e., 27 (54%) cases .(Table 2) Clinically, BT was

the most common type of leprosy with 30% (15) followed by TT in 28%(14), BB in 14%(7), IDL in 12%(6) LL in 10%(5) and BL in 6%(3). Histopathologically, majority of the cases i.e., 36%(18) belonged to TT followed by BT in 28%(14), LL in 12%(6),IDL in 10%(5),BL in 8% (4) and BB in 6%(3) (Table 3)

IV. Discussion

Leprosy is a chronic, infectious disease caused by *Mycobacterium leprae* and is present in different clinico-pathological forms, depending on the immune status of the host. The study of pathological changes in leprosy lesions has contributed a great deal to understanding the disease and clinico-pathological correlative

studies have provided further insights into the disease, its varied manifestations and complications.[5] Accurate classification of leprosy is needed as it is present in different clinicopathological forms. The most widely accepted classification system is that of Ridley- Jopling.[3] However, many diversities are seen between the histopathological and clinical features. The patients in our study were 28 (56%) males and 22 (44%) females between 8 and 86 years of age. The majority of patients 27 (54%) were in the age group of 31-50 years . A similar study conducted by Moorthy et al. from India, among 372 leprosy patients showed 242 (65.05%) males and 130 (34.95%) females between three and 86 years of age. The majority of patients were in the age group of 20-29 years (20.70%) and least affected were children below 9 years (6.45%).[6]

In our study ,clinically, BT was the most common type of leprosy with 30% (15) followed by TT in 28%(14), BB in 14%(7), IDL in 12%(6) LL in 10%(5) and BL in 6%(3).Histopathologically, majority of the cases i.e., 36%(18) belonged to TT followed by BT in 28%(14), LL in 12%(6),IDL in 10%(5),BL in 8% (4) and BB in 6%(3).Overall agreement in the diagnosis was seen in 25 (50%) cases.

The maximum concordance of 80% was seen in LL cases followed by TT (57%), BT(53.33%), IDL (50%), BL (33.33%) and major discordance was observed in BB(14.29%) cases. Maximum concordance was observed in LL type of leprosy, which was similar in studies by Mathur MC et al., Giridhar M et al and Moorthy et al.However, concordance differed variably when compared with other types of Leprosy, which may be due to more precise diagnostic criteria laid down in histopathology with emerging microbiological and immunological techniques. The observations strongly suggest the importance of histopathological diagnosis in these cases, as lesions are easy to diagnose clinically towards Lepromatous pole of the disease.[7] Thus, skin biopsies should be taken from the representative lesions so that the diagnosis can be established as an adjunct to clinical diagnosis and fulfilling the criteria for classifying the disease spectrum, which helps in proper treatment and eradication of the disease. Considering the data of present study and other comparative studies, we may state that maximum correlation is seen with LL as it shows a fixed histopathology. However, in early cases of midborderline (BB) and borderline lepromatous (BL) forms of disease, histopathology shows some ambiguity.

Table 1. Showing age distribution in the subjects

Age group(years)	No of cases	Percentage
<30 years	18	36%
31-50 years	27	54%
>50 years	5	10%
Total	50	100%

Table 2. Showing frequency and percentage of gender distribution

	Frequency	% age
Females	22	44%
Males	28	56%
Total	50	100

Table 3. Showing clinical and histopathological distribution of leprosy

Type of leprosy	No of clinical cases	% of clinical cases	No of histopathological cases	% of histopathological cases
BB	7	14	3	6
BL	3	6	4	8
BT	15	30	14	28
IDL	6	12	5	10
LL	5	10	6	12
TT	14	28	18	36
Total	50	100	50	100

Table 4. AFB positivity in various types of leprosy

		AFB POSITIVITY	
		NUMBER POSITIVE	Percentage positive
Type of leprosy	BB	1	33.30
	BL	1	25.00
	BT	4	28.60
	IDL	0	-
	LL	4	66.70
	TT	0	-
Total		10	20.00

Table 5. Clinico histopathological concordance in leprosy

		Histopathological break up among clinically diagnosed cases						Total	
		BB	BL	BT	IDL	LL	TT	No of clinical cases	% parity
clinical type	BB	1	1	0	0	1	4	7	14.29%
	BL	1	1	1	0	0	0	3	33.33%
	BT	1	1	8	0	1	4	15	53.33%
	IDL	0	0	1	3	0	2	6	50.00%
	LL	0	1	0	0	4	0	5	80.00%
	TT	0	0	4	2	0	8	14	57.14%
	Total	3	4	14	5	6	18	50	50.00%

p<0.05, significant

V. Conclusion

Leprosy is a chronic granulomatous disease widely prevalent in India and is present in different clinico-pathological forms. Study of these lesions has contributed a great deal in understanding the disease. Most cases can be diagnosed clinically; especially those towards the Lepromatous pole of the disease, however, other types of Leprosy pose a significant problem in clinical diagnosis. Skin biopsy is a useful tool in confirming the clinical diagnosis of leprosy as well as for the therapeutic guide.

Acknowledgement

Conflict Of Interest
None.

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