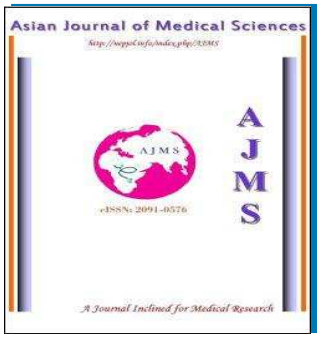

SPECTRUM OF LEPROSY PATIENTS WITH CLINICO-HISTOPATHOLOGICAL CORRELATION: A HOSPITAL BASED STUDY

ORIGINAL ARTICLE, Vol-4 No.4

Asian Journal of Medical Science, Volume-4(2013) http://nepjol.info/index.php/AJMS

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"Diagnosis of Leprosy must be joint efforts of Dermatologist, Microbiologist and Pathologist, based on clinical, histopathological features and Bacteriological Index"

ABSTRACT

Introduction: Leprosy is a chronic granulomatous, infectious disease involving skin and peripheral nerves. It is present in various clinico-pathological forms depending upon immune status of the patients. Histopathological examination of skin provides confirmatory diagnosis in suspected cases and gives indication of progression and regression of disease under treatment. Ridley and Jopling classification is used to classify leprosy. The objective of study was to identify the clinical pattern of leprosy and performed detail clinico- histopathological correlation in our institute.

Method: The study was carried out on the skin biopsies received in between 2007-2010. Biopsies were fixed in 10% formalin, processed and stained with Hematoxylin and Eosin, modified Fite Ferraco and Ziehl-Neelsen stains. The predesigned Performa was used to record observation. The clinical diagnosis were correlated with histopathology in all 120 cases.

Result: The age of the patients was ranged from 8 to 79 years with mean age of 36.38 years. The male to female ratio of patients was 1.5 to 1. The majority of cases 79 (65.8%) were in the age group of 21-50 years. Highest parity was observed in stable polar group TT 100%. Clinco-histopathological agreement was seen in 98 (81.67%) cases, 14 (11.67%) cases shows minor disagreement and 8 (6%) cases major disagreement.

Conclusion: The clinical and histopathological features along with bacteriological index are useful than any single parameter in arriving definitive diagnosis and classification of the leprosy.

Key words: Leprosy, Ridley-Jopling, Histopathology.

INTRODUCTION

Leprosy also known as Hansen's disease, is a chronic granulomatous, infectious disease involving skin, peripheral nerves.[1] The three cardinal sign of the disease are skin lesions, skin anesthesia and enlarged peripheral nerves.[2] In India despite declaring leprosy elimination at national level in January 2006,[3] it is still a disease of public health importance and endemic in many of states. The Leprosy is a major public health problem of the developing countries with an estimated total global new cases detected in 2009 were 2, 27, 849 and India account 1, 33, 717 (58.7%) cases.[4]

Leprosy present in various clinico-pathological forms depending upon immune status of the patients.[5] The study of pathological changes in leprosy help in understanding of disease, complications and its exact typing.[6] Diagnosis of leprosy must be joint efforts of dermatologist, microbiologist and pathologist. Leprosy can be diagnosed by various methods including detail clinical examination of the skin lesions and peripheral nerves,[7,8] demonstration of the Acid Fast Bacilli (AFB) in slit skin smears by Ziehl-Neelsen staining,[9] Histopathological section,[6,10] demonstration of bacilli by modified Fite-Ferraco procedure[11], and Fine Needle Aspiration Cytology (FNAC) of skin and nerves.[12]

Histopathological examination of skin provides confirmatory information in suspected case and gives indication of progression and regression of disease under treatment.[13] Ridley and Jopling have suggested immunological basis of leprosy and classified in to five types; Tuberculoid (TT), Borderline Tuberculoid (BT), Midborderline (BB), Borderline Lepromatous (BL), and Lepromatous (LL).[14] Later they develop clinical and bacteriological findings in each group with respective immunological and histopathological findings.[7]

The objectives of present study were to identify the clinical pattern of leprosy and perform detail clinico- histopathological correlation in our institute.

MATERIALS AND METHODS

The present study was carried out on the elliptical skin biopsies received from Department of Dermatology in the Histopathology section of Department of Pathology, Sri Venkateshwara Medical College Hospital and Research Centre, Pondicherry, from June 2007-May 2010. All the cases were selected regardless of their age, sex, socioeconomical status, occupation and community. Biopsies were fixed in 10% formalin and processed. Hematoxylin and Eosin[15] stained slides of skin biopsy of all leprosy patient were studied in detail. The sections were stained for modified Fite-Ferraco[11] stain and Ziehl-Neelsen[9] staining wherever is required for the demonstration of mycobacterium bacilli. The predesigned proforma was used to record observations. The biopsies were studied for the epidermal atrophy, epitheloid granuloma, lymphocytic and histiocytic infiltration of nerves bundles and Grenz zone.

The clinical diagnosis of leprosy cases as provided by Dermatology Department in to TT, BT, BB, BL, and LL based on Ridley and Jopling classification were correlated with histopathology in the respective biopsies. Biopsies which did not include full depth of dermis together with a portion of subcutaneous fat were reported as inadequate and requested to repeat biopsy in those cases.

RESULTS

The Histopathology section of Pathology department received 6435 specimen from June 2007 to May 2010. The skin biopsies were 760 which comprise 11.8% of the total histopathological specimen. The leprosy biopsies were 120 which account 15.8% of the skin biopsy and 1.8% of total histopathology specimen.

The age of the patients ranges from 8 to 79 years with mean age of 36.38 years. The male to female ratio was 1.5 to 1. (Table No.1) The majority of cases 79 (65.8%) were in the age group of 21-50 years. Clinical features were available in all cases

Table 1. Leprosy cases according to histopathological diagnosis with age and sex distribution

Age range	Histopathological diagnosis																Total
	TT		BT		BB		BL		LL		IL		HL		NSD		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
01-10	01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01
11-20	--	01	04	03	--	--	02	01	--	01	01	01	--	--	03	--	17
21-30	01	02	07	10	03	04	03	02	03	--	01	--	01	01	--	--	38
31-40	02	--	02	02	03	--	04	03	02	01	--	01	01	--	--	--	21
41-50	01	02	01	03	02	02	04	--	02	01	--	--	01	01	--	--	20
51-60	--	--	01	02	--	--	04	01	02	01	--	--	--	--	--	--	11
61-70	02	--	02	01	02	--	01	--	--	--	--	--	--	--	--	--	08
71-80	--	--	--	--	--	--	01	--	02	01	--	--	--	--	--	--	04
Sub Total	07	05	17	21	10	06	19	07	11	05	02	02	03	02	03	--	120
Total	12		38		16		26		16		04		05		03		120
%	10.0		31.7		13.3		21.7		13.3		3.3		4.2		2.5		100
M = 72	60%				F = 48		40%				M to F		Ratio		= 1.5		

TT= Tuberculoid, BT= Borderline Tuberculoid, BB= Mid borderline, BL= Borderline Lepromatous, LL= Lepromatous, IL= Indeterminate Leprosy, HL= Histoid Leprosy, NSD= Nonspecific dermatitis, M= Male, F= Female

Table 2 (Clinico-Histopathological correlation)

Clinical diagnosis		Histopathological diagnosis								
		TT	BT	BB	BL	LL	IL	HL	NSD	Parity %
	TT	8	--	--	--	--	--	--	--	8 (100%)
	BT	4	35	--	2	--	1	--	--	35 (83.3%)
	BB	--	1	15	4	--	--	--	--	15 (75%)
	BL	--	--	1	18	--	--	--	--	18 (94.7%)
	LL	--	2	--	2	14	--	--	2	14 (70%)
	IL	--	--	--	--	--	3	--	1	3 (75%)
	HL	--	--	--	--	2	--	5	--	5 (71.4%)
	Total	12	38	16	26	16	4	5	3	120

TT= Tuberculoid, BT= Borderline Tuberculoid, BB= Mid borderline, BL= Borderline Lepromatous, LL= Lepromatous, IL= Indeterminate Leprosy, HL= Histoid Leprosy, NSD= Nonspecific dermatitis,

and all 120 (100%) cases were compared with histopathological diagnosis. Majority of cases were in Border line Tuberculoid, Mid Borderline and Borderline Lepromatous which account about 80 (66.7%) of total leprosy cases. Clinico-histopathological agreement was seen in 98 (81.67%) cases and disagreement in 22 (18.3%) cases. (Table No. 2 &3). The case with clinico-histopathological disagreement were again divided into two categories namely, minor disagreement (disagreement in one group) and major disagreement (more than one group). The minor disagreement was seen in 14 (11.67%) and major disagreement was seen in 8 (6%) cases. Highest clinico-histopathological agreement was seen in Tuberculoid leprosy (TT) and disagreement was seen in Lepromatous leprosy (LL) groups, 100% and 30% respectively. (Table No.3)

In our study the 7 cases of clinically suspected histoid leprosy were received in which 5 cases

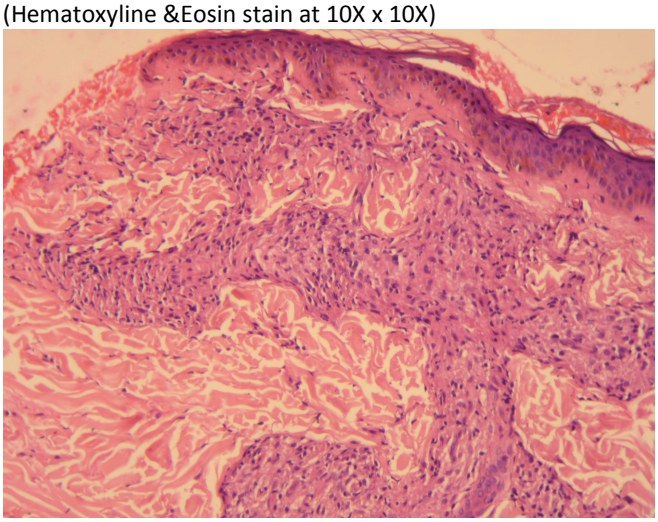
Table 3 (Disagreement in clinical and histopathological diagnosis)

Clinical diagnosis	Cases	Complete parity No. (%)	Minor Disagreement No. (%)	Major Disagreement No. (%)
TT	8	8 (100%)	----	----
BT	42	35 (83.3%)	4 (9.5%)	3 (7.12%)
BB	20	15 (75%)	5 (25%)	-----
BL	19	18 (94.7%)	1 (5.3%)	----
LL	20	14 (70%)	2 (11.2%)	4 (22.4%)
IL	4	3 (75%)	----	1 (25%)
HL	7	5 (71.4%)	2 (28.6%)	----
Total	120	98 (81.67%)	14 (11.67%)	8 (6%)

TT= Tuberculoid, BT= Borderline Tuberculoid, BB= Mid borderline, BL= Borderline Lepromatous, LL= Lepromatous, IL= Indeterminate Leprosy, HL= Histoid Leprosy, NSD= Nonspecific dermatitis,

were proven as Histoid leprosy while 2 cases as Lepromatous leprosy. The Histoid leprosy cases were 5 (4.2%) of total leprosy cases. The classical microscopic and clinical photographs of the tuberculoid leprosy and Lepromatous Leprosy are provided, for the publication. (Fig. 1, 2, 3 and 4)

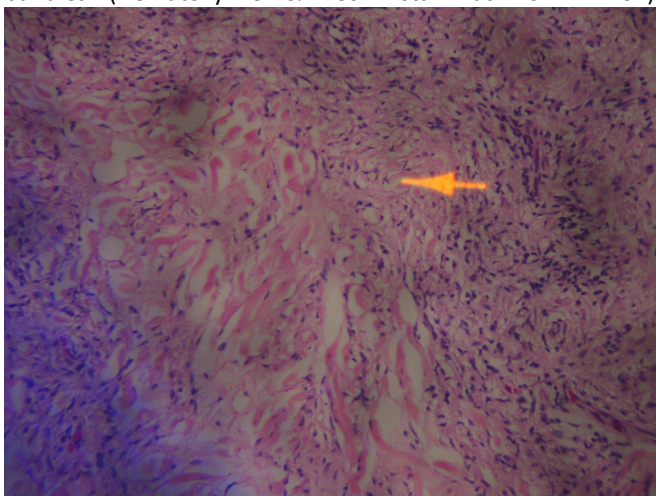
Figure No. 1 Tuberculoid Leprosy showing neural tissue with dense lymphocytic inflammation and dense collagen bundles (Hematoxyline &Eosin stain at 10X x 10X)



DISCUSSION

The leprosy was classified on the basis of immunity of the individual by Ridley and Jopling in to five groups and it is very well correlate with the clinical, histopathological and bacteriological findings.

Figure No.2 Lepromatous Leprosy showing foamy macrophage and lymphocytic infiltration around neural bundles (Hematoxyline & Eosin stain at 40X x 10X)



The age of the patients in present study varies from 8 year to 79 year with mean age of 36.38 year. The maximum number of cases 79 (65.8%) were observed in active age group of 21-50 years. The Jindal N[16] et al also observed maximum 47.8% of cases in 20-40 year. Moorthy BN[17] et al observed Male to Female ratio of 1.8 to 1 which is close to our study and Mittal RR[16] et al observed Male to Female ratio 3.25 to 1 which was very high. Clinical spectrum of the leprosy cases in the present studies revealed that most of the case were in borderline categories BT,BB and BL which account

Figure No. 3 Lepromatous Leprosy showing lepra bacilli in clusters "globi appearance" (Fite Ferraco stain at 40X x 10X)

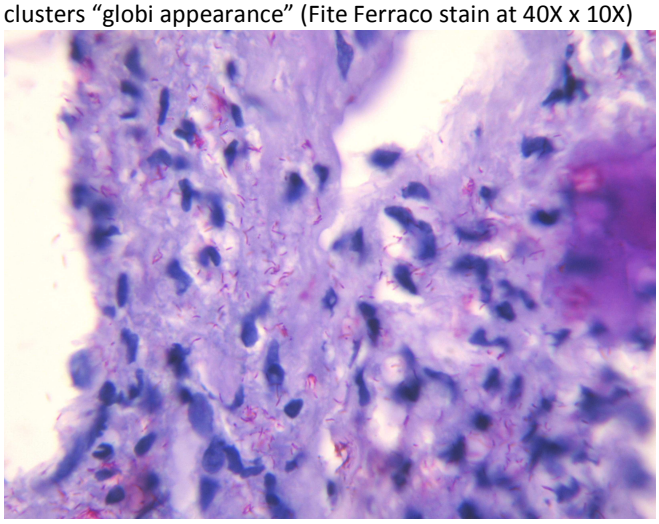


Figure No. 4 Lepromatous Leprosy showing facial nodules of variable size - Clinical appearance

about 80 (66.7%) of total leprosy cases. The similar observation also reported by Shenoi SD[18] et al, Nadkarni NS[19] et al and Moorthy BN[17] et al. In our study complete parity was observed in 98 (81.67%) cases while Moorthy BN[17] et al, Jarath VP[20] et al and Kar PK[21]et al observed complete parity in 62.6%, 68.5% and 70% respectively. The reason of high parity in our study may be that the dermatologist provided more than one clinical categories in some cases. Highest parity was observed in stable polar group TT and LL 100% and 70% respectively which is similar to observation made by the Kar PK[21] et al TT (87.5%) and LL (70%).

The maximum parity observed in polar groups while maximum disparity observed in Borderline cases because polar cases showed a fixed histopathology while borderline have different histopathology in different sites and lesions.[21]

There is no independent gold standard for leprosy diagnosis. The histopathology in leprosy cases varied with the difference in sample size, choosing the biopsy site, age of the lesion, immunological and treatment status of the patient at the time of biopsy.[22, 23]

In our study the clinico-histopathological parity of IL was 75%, similar observation of similar observation of 81.2% was reported by the KAR PK et al in their study. The early leprosy lesion difficult to diagnose even by experienced dermatologist. Histopathology play very good role in the diagnosis of early leprosy cases.[17]

In the present study the histoid leprosy was present in 4.2% of cases. The incidence of the histoid leprosy in India is 1.2-3.6%.[24, 25] The Kaur I[26] et al also reported incidence of histoid leprosy 1.8%. In our study it was slightly higher.

Lastly we conclude that the spectrum of leprosy is very much overlapping hence histopathological examination should be done for confirmation of diagnosis and typing of disease in all cases before starting treatment.

CONCLUSION

The spectrum of leprosy manifestation is very wide and there is considerable overlap between different types of leprosy so both clinical and histopathological features along with bacteriological index are more useful than any single parameter in arriving definitive diagnosis and classification of the disease.

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