DOI:10.5958/j.2319-5886.2.4.142

International Journal of Medical Research & Health Sciences

www.ijmrhs.com Volume 2 Issue 4 Oct - Dec Coden: IJMRHS Copyright @2013 ISSN: 2319-5886

Received: 24th Aug 2013 Revised: 17th Sep 2013 Accepted: 29th Sep 2013

Research article

CLINICO HISTOPATHOLOGICAL CORRELATION WITHIN THE SPECTRUM OF HANSEN'S DISEASE: A MULTICENTRIC STUDY IN NORTH INDIA

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ABSTRACT

Background: Leprosy is one of the oldest and chronic infectious diseases known to human being caused by Mycobacterium leprae. Leprosy is widely prevalent in all parts of India and it presents with different clinico-pathological forms. 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. **Methods:** A prospective hospital based study was conducted among patients attending Dermatology OPD of two tertiary care centres in this region over a period of two years. All clinically suspected new leprosy patients were included in the study. A detailed clinical history and examination was carried out and skin biopsies were taken from the most active part of lesions. Sections were stained with Hematoxylin & Eosin stain and Fite-Feracco stain. Histopathological findings were compared with clinical diagnoses. **Results:** A total of 190 cases were studied, out of which 137(72.10%) were males and 53(27.9%) were females. The histopathological diagnosis of leprosy was established in 99.47% of clinically diagnosed cases. Clinico-histopathological concordance was seen maximum in LL (97.22%), followed by BT (79.76%), TT (71.43%), BL (66.67%), BB (66.67%) and least in IL (50.00%). Overall concordance was 56.54% **Conclusion:** Clinical diagnoses of Leprosy still pose a significant problem, especially the Intermediate subtypes of the disease spectrum. Histopathological examination of the active skin lesions should be done in all new cases to confirm the spectrum of disease and expected duration of therapy.

Keywords: Leprosy, Lepromatous leprosy, Skin biopsy

INTRODUCTION

Leprosy is one of the oldest and chronic infectious diseases known to human being caused by Mycobacterium leprae. The disease still carries a grave social stigma and ostracism which compels the patients to hide the disease. Leprosy

continues to be an important public health problem in most parts of Asia, especially India.[1]

Leprosy is a progressive, chronic granulomatous disease of the peripheral nerves and skin and other tissues such as mucous membranes, muscles and reticuloendothelial system. The disease presents in various clinico-pathological forms depending on the immune status of the host. 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-bordrline (BB), Borderline Lepromatous (BL), and Lepromatous (LL).[2]

The Classification has been accepted worldwide and is highly recommended. 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. [3]

The present research was taken to study the correlations between the clinical and histological diagnosis of the tissue sections from clinically suspected patients in this region, and to evaluate to the importance of skin biopsy as an important tool in diagnosing leprosy in these patients. [3]

MATERIAL AND METHODS

A prospective hospital-based study was conducted among patients attending Dermatology OPD of Rohilkhand Medical College & Hospital, Bareilly and SRMS Institute of Medical Sciences, Bareilly and few others private hospitals in this region, between January 2012 to December 2012. The study was approved by the Institutional Ethics Committee, and is informed consent from taken from all the participants

Unit of Study: Both sex patients of all age groups between 2 to 70 years, having clinically suspected leprosy were included in the study.

Exclusion criteria: Patients already treated with anti-leprosy medications at any time earlier were excluded.

Nature of Study: The study includes all patients with clinically diagnosed leprosy and was subjected to history and examination after taking informed consent and approval from Institutions' Ethical Committee.

Sample Size: Total no. of cases studied was 190.

Study Schedule: A detailed clinical history and examination was carried out. Clinical examination included the type, number and site of lesion, type of disease and neural involvement. All the patients were subjected to skin biopsies from the most active part of the lesions. Biopsies were fixed in 10% formalin & processed. Serial sections of 5µ thickness were cut and stained with routine Haematoxylin and Eosin and Fite-Feracco stains. The Ridley & Jopling classification was followed in both clinical and histopathological diagnosis. Histopathological evaluation included invasion of epidermis, involvement of sub-epidermal zone, character & extent of granulomas, density of lymphocytic infiltrate, epitheloid cells and other cellular elements, nerve involvement and presence of M. leprae.

RESULTS

Table 1: Clinical presentation in various types of leprosy

Clinical diagnosis	Hypopigmented patch (No. of cases)	Erythematous plaque/ papule/nodule (No. of cases)	No.of cases	%
Tuberculoid Leprosy (TT)	06	09	15	7.89
Borderline Tuberculoid (BT)	75	11	86	45.26
Mid Borderline (BB)	02	02	04	2.12
Borderline Lepramatous (BL)	10	16	26	13.68
Lepramatous Leprosy (LL)	16	29	45	23.68
Intermediate Leprosy (IL)	08	06	14	7.37

Table 2: Histopathological distribution of leprosy cases

Histopathological diagnosis	No. of cases	%
Tuberculoid Leprosy (TT)	14	7.40
Borderline Tuberculoid (BT)	84	44.44
Mid Borderline (BB)	03	1.6
Borderline Lepramatous (BL)	24	12.70
Lepramatous Leprosy (LL)	36	19.05
Intermediate Leprosy (IL)	28	14.82
Total	189	100

Table 3: Observation of AFB in different types

Type of Leprosy	No. of Positive cases	Percentage
Tuberculoid Leprosy (TT)	--	--
Borderline Tuberculoid (BT)	08	8.42
Mid Borderline (BB)	11	11.58
Borderline Lepramatous (BL)	28	29.47
Lepramatous Leprosy (LL)	34	35.79
Intermediate Leprosy (IL)	14	14.73
Total	95	100

No acid fast bacillus could be demonstrated in any case of TT

Table 4: Distribution of Site of lesions

Site of Lesion	Number of cases	Percentage
Head & Neck	40	21.05
Upper limb	65	34.21
Lower limb	30	15.79
Trunk	25	13.16
Multiple sites	30	15.79
Total	190	100

Table 5: Comparison of clinical and histopathological diagnosis

Histological Types	Clinical Types						Percentage of concordance
	TT	BT	BB	BL	LL	IL	
TT (14)	10	04					71.43
BT (84)	03	67	-	10	04	-	79.76
BB (03)		01	02				66.67
BL (24)		03	01	16	04		66.67
LL (36)				01	35		97.22
IL (28)	02	11	01			14	50.00
Total (189)	15	86	04	26	45	14	

Table 6: Comparison of Sex Distribution

Authors	Males (%)
Moorthy et al (2001) [6]	65.05
Bhushan et al (2008) [5]	72.34
Mathur MC et al (2011) [2]	53.8
Gridhar M et al (2012) [3]	77.6
Present study (2013)	72.10

Table 7: Comparative Analysis of Overall Concordance with other similar studies

Studies	Year	Overall Concordance %
Kalla G et al [7]	2000	60.6
Tailor et al [8]	2008	58
M Giridhar et al [3]	2012	60.23
Present Study	2013	56.54

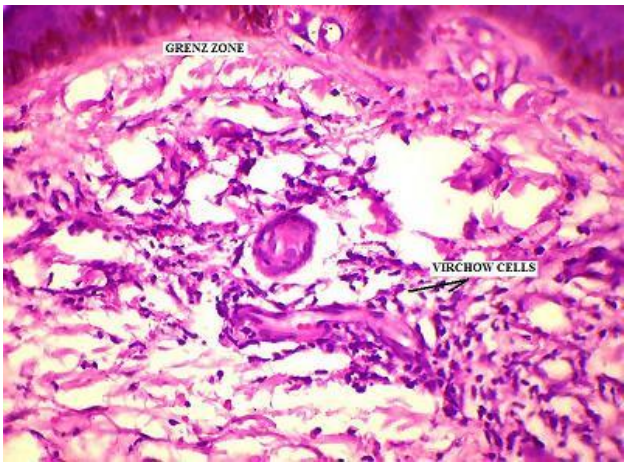

Fig1: Grenz zone and macrophage granuloma in Borderline tuberculoid leprosy (H&E)

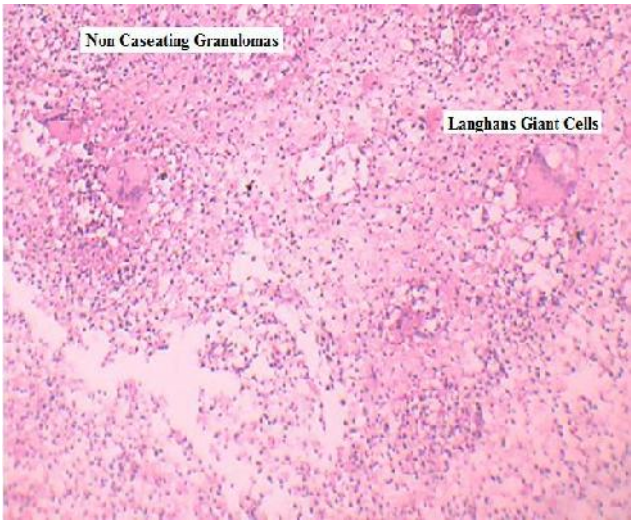

Fig 2: Non caseating granulomas & Langhans

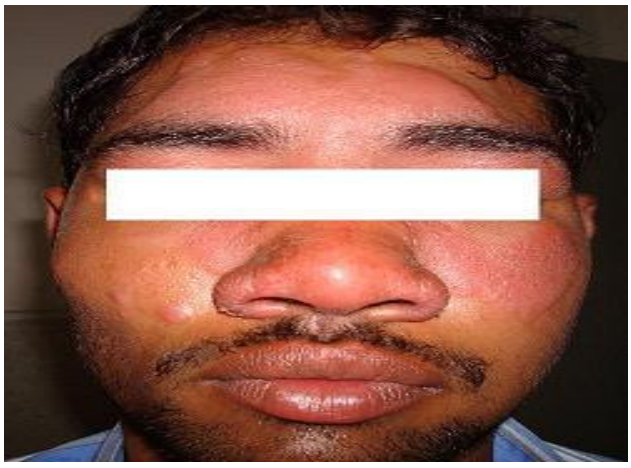

Fig3: A case of BT leprosy with satellite lesion

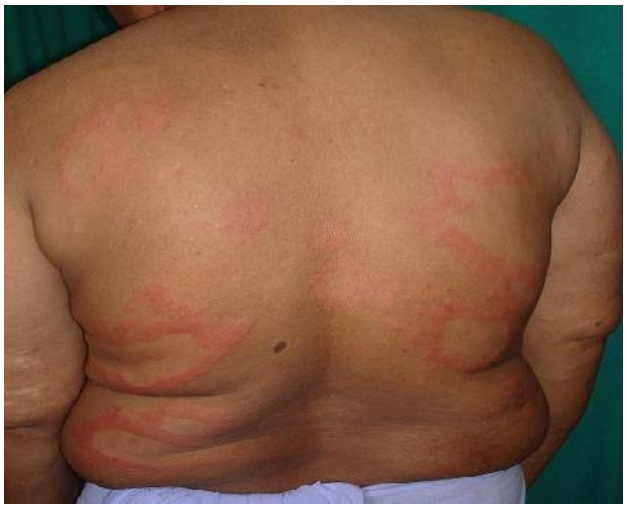

Fig 4: Case of Mid Borderline Leprosy

DISCUSSION

In the present study, a total of 190 clinically diagnosed leprosy patients were examined and were subjected to clinical and histopathological examination, which included various aspects of the lesions, like number and site of lesions, type of disease.

The studied showed the most common clinical presentation to be with hypopigmented patch (61.58%) followed by erythematous plaque or nodule (38.42%). This correlated well with study done by M Gridhar et al.[3] and Ocampo and Francisco.[4]

The sex ratio was heavily skewed towards males (72.10%). This is similar to other Indian studies undertaken by Gridhar M et al (77.6%) [3l] & Bhushan et al (72.34%)[5]. Mathur MC et al.[2] however observed 53.8% males in their study while Moorthy et al. observed 65.05% males.[6]

In the present study concordance between clinical and histopathological diagnosis for individual type of leprosy was found to be TT (71.43%), BT (79.76%), BB (66.67%), BL (66.67%), LL (97.22%) and IL (50.00%). Maximum concordance was observed in LL type of leprosy, which was similar in studies by Mathur MC et al.[2], Gridhar M et al[3] and Moorthy et al.[6] 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.[4]

In our study, histological diagnosis of leprosy was established in 99.47% cases. One case (0.53%) was diagnosed as Lupus Vulgaris. Similar observations have been made by different authors in their studies, however with lesser specificity. The discrepancy, whenever seen may be due to clinical overdiagnosis of leprosy and misinterpretation of many skin lesions presenting with hypopigmented patches. [3,4,6]

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. Many 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. Histopathological examination of the lesions confirms the exact subtype of the disease and should be done in all cases so as to facilitate the institution of accurate mode of therapy.

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