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Research Paper

Histopathological and Clinical correlation of leprosy in a rural population of South India

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ABSTRACT:- Leprosy, also known as Hansen's disease, is a chronic specific infectious disease caused by Mycobacterium leprae. Leprosy is one of the major health problems of developing countries including India[1,2,3,4]. The microorganism has a predilection for the skin and nerves, resides mainly within the mononuclear phagocytic cells. The disease is clinically characterized by one or more of the three cardinal signs: thickened peripheral nerves, hypopigmented or erythematous skin patches with definite loss of sensation, and acid-fast bacilli detected on skin smears or biopsy material.The present study aims to describe the clinical pattern of the disease, and to correlate clinical diagnosis with histopathogical findings with AFB (acid-fastbacilli-M.leprae) status.Forty six cases of leprosy reporting to dermatology department ofKamineni Institute of Medical Sciences (KIMS) hospital, Narketpally over a period of two yearsfrom March 2013 to April 2015 were includedin the study. Biopsy tissues were processed and histopathological findings were studied on Hematoxylin and Eosin stained sectionsand modified Fite-Faraco stain for detection of acid-fast bacilli. The study included46 cases out of which (50%) were clinically diagnosed as borderline tuberculoid (BT) followed by tuberculoid(TT) (21.75%),lepromatous leprosy(LL) (10.87%) and least were borderline leprosy (BL) (8.69%), mid borderline leprosy(BB) (8.69%). The histopathologicallydiagnosis was BT(43.48%), TT (17.39%) followed by BB(15.22%),LL(13.05%), and BL(10.86%). Thus, correlation of clinical and histopathological diagnosis appears to be more useful for accurate classification of leprosy and to facilitate appropriate therapy to prevent undesirable complication.

KEYWORDS:- Clinical diagnosis, Correlation, Histopathology, Leprosy.

I. INTRODUCTION

Leprosy is one of the major health problems of developing countries including India[1,2,3,4].It is also known as Hansen's disease, and is a chronic specific infectious disease caused by Mycobacterium leprae, a microorganism that has a predilection for skin and nerves.Mycobacterium leprae, the causative agent of leprosy, was discovered by G. H. Armauer Hansen in Norway in 1873, making it the first bacterium to be identified as causing disease in humans[5,6]. Though nonfatal, leprosy is one of the most common causes of nontraumatic peripheral neuropathy worldwide.Lepromatous leprosy patients are the most important reservoirs of infection.M.leprae primarily infects Schwann cells in the peripheral nerves leading to nerve damage and the development of disabilities. Despite reduced prevalence of M. leprae infection in the endemic countries following implementation of multidrug therapy (MDT) program by WHO to treat leprosy, new case detection rates are still high-indicating active transmission. Human genetic factors influence the acquisition of leprosy and the clinical course of disease[7].Single-nucleotide polymorphism association studies showed a low lymphotoxin-(LTA) producing allele as a major genetic risk factor for early onset leprosy[8]. The entry route of M. leprae into the human body is also not definitively known. The skin and the upper respiratory tract are most likely, however recent research increasingly favors the respiratory route[9,10]. The susceptibility tothe mycobacteria and the clinical course of the disease are attributed to the host immune response, which heralds the review of immunopathology of this complex disease.Thepresent study was undertaken to study the demographic distribution of newly detected leprosy cases in rural settings of Telangana, and quantify the correlation between the clinical and histopathological diagnosis andAFB (acid-fast bacilli-M.leprae) status.

II. MATERIALS AND METHODS

Forty-six new clinically diagnosed and consenting cases of leprosy, reporting to dept of dermatology at Kamineni Institute of Medical Sciences, Narketpally over a period of two years (March 2013 to April 2015) were included in the study.The demographic data, clinical findings and clinical diagnosis were recorded from the requisition slip forwarded along with the biopsy material for histopathological diagnosis. Particularly in reference to skin, nerves and sensory disturbances, a detailed clinical examination was carried out including general, local and systemic examination with relevant past and family history was asked. Deformities were graded as per the WHO grading system[11]. The biopsies were taken from the most active lesions (margin of the lesion) and were sent in 10% formalin bulbs to pathology department. The biopsyspecimens of leprosywere processed and serial sections were stained using the routine Hematoxylin and Eosin stained sections in relation to clinical findings and modified Fite-Faraco stain for detection of acid-fast bacilli. The histopathological diagnosis was based on the scheme put forth by Ridley and Jopling[12,13,14].46 cases of clinical charts and histopathological reports were examined. On the basis of standard statistical techniques, data pertaining to age, sex, clinical and histopathological classification of the type of leprosy were collected and analyzed.

III. RESULTS

The study includes 46 cases. Age and sex distribution of the cases is shown in Table 1 and 2, respectively. As seen from the table 1 (84.7%) of the patients belonged to 21-50 years. There were more males than females with M: F ratio of 2.8:1.8. The majority of the patients 89.1% belonged to lower socioeconomic class, 8.7% belonged to middle class and only 2.2% to upper class. 84.7% of the patients were illiterate, 10.9% had a primary education and 4.4% had a secondary or higher education.The highest number of cases (50%) was clinically diagnosed as borderline tuberculoid (BT) followed by tuberculoid (TT) (21.75%). Lepromatous leprosy (LL) were 10.87%, and borderline leprosy (BL) mid borderline leprosy (BB) was diagnosed in 4 cases (8.69%) each. Histologically BT was confirmed in 43.48%, TT in 17.39%, BB in 15.22%, LL in 13.05% and BB in 10.86% of cases. Maximum parity in clinic pathological correlation was seen in LL (100%) followed byBT (82.60%), BL (75%), BB (75%) and TT (70%). TT cases showed maximum disparity of 30%.

IV. DISCUSSION

The age and sex distribution of cases reveal that 84.7% of cases were seen in age group 21-50, and 60.87% were in males. This age difference may be due to differences in exposure, opportunities for infection and immunological differences in children and adults.[15,16] The study shows male preponderance. Similar findings were recorded by the National Leprosy Eradication Programme (NLEP) in 2007[17].The socioeconomic status reflects that Leprosy is a disease of the poor and overcrowding of homes. Educational status of leprosy cases shows that most cases are illiterate, showing unawareness and lack of information among common people about leprosy and its common symptoms, disabilities and the need for early diagnosis and treatment.The present study showed the highest number of cases in BT type and the least number of cases in BB and BL type. The low number of cases in BB and BL types in the present study confirms the immunological instability of these types of patients. The least cases were histopathologically diagnosed as BLgroup, indicating that it is unstable.

As per the present study, the highest disparity was found in TT and the least in LL. Analysis of the disparity data (Table 4) reveals that, in general the clinicians were diagnosing the cases towards lower spectrum of the leprosy classification. As per the present study, borderline leprosy falls in the intermediate part of the spectrum of leprosy, which is immunologically characterized with instability as one of its cardinal features, so the disparity is high (25%) in borderline cases.

Histopathological examination in leprosy increases the accuracy of diagnosis while clinical features indicate only the gross morphology of lesion caused by underlying pathological changes, since tissue response varies in the disease spectrum due to the availability of Cell Mediated Immunity. Under NLEP, patients are classified into one of the two groups for therapeutic purposes: paucibacillary (TT, BT) and multibacillary (BB, BL, LL). Thus the study reveals that 4 cases out of 46 (8.69%) that were classified as TT & BT (paucibacillary) deserved therapeutic management under the NLEP as multibacillary leprosy. Thus there is a need for inclusion of histopathological back up to the national programme for accurate diagnosis and correct classification of borderline cases of leprosy, and cases that pose classification dilemma to the clinician.

V. CONCLUSION

Leprosy is a disease present in low socioeconomic status, overcrowding and people suffering from poverty, correlating with the country's growth and economy. The present study has shown disparity in clinical and histological diagnosis, especially in borderline group due to variation in cell mediated immunity. Histopathology and Fite -Faraco stain can help in the proper labeling of a case on the leprosy spectrum. Thus,

correlation of clinical and histopathological features appears to be more useful for classification of leprosy and to facilitate accurate therapy to prevent undesirable complications.

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TABLES:

Table-1: Age wise Distribution of Cases

Age in years	Percentage of cases
0-10	0 (0%)
11-20	4(8.69%)
21-30	23(50%)
31-40	10(21.7%)
41-50	6(13.09%)
51-60	3(6.52%)
>60	0(0%)

Table-2: Sex wise Distribution of cases

Sex	No of cases
Male	28
Female	18

Table-3: Distribution of leprosy cases (Clinical Vs Histopathological)

Type	Clinical	Histopathological
TT	10(21.75%)	8(17.39%)
BT	23(50%)	20(43.48%)
BB	4(8.69%)	7(15.22%)
BL	4(8.69%)	5(10.86%)
LL	5(10.87%)	6(13.05%)

Table-4: Clinical and histopathological co-relation

Clinical type	No.ofcases diagnosed clinically	H.P Type					% Parity	% Disparity
		TT	BT	BB	BL	LL		
TT	10	7	1	2	-	-	70	30
BT	23	1	19	2	1	-	82.60	17.40
BB	4	-	-	3	1	-	75	25
BL	4	-	-	-	3	1	75	25
LL	5	-	-	-	-	5	100	0
	46(100%)	8	20	7	5	6	80.43	19.57

PICTURES:

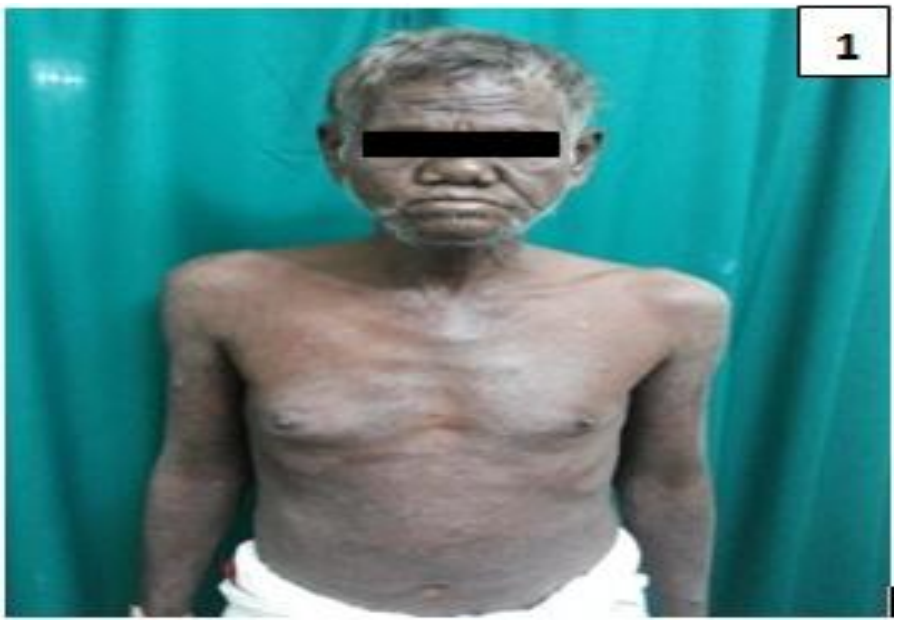


FIGURE 1: Clinical photograph of Lepromatous leprosy

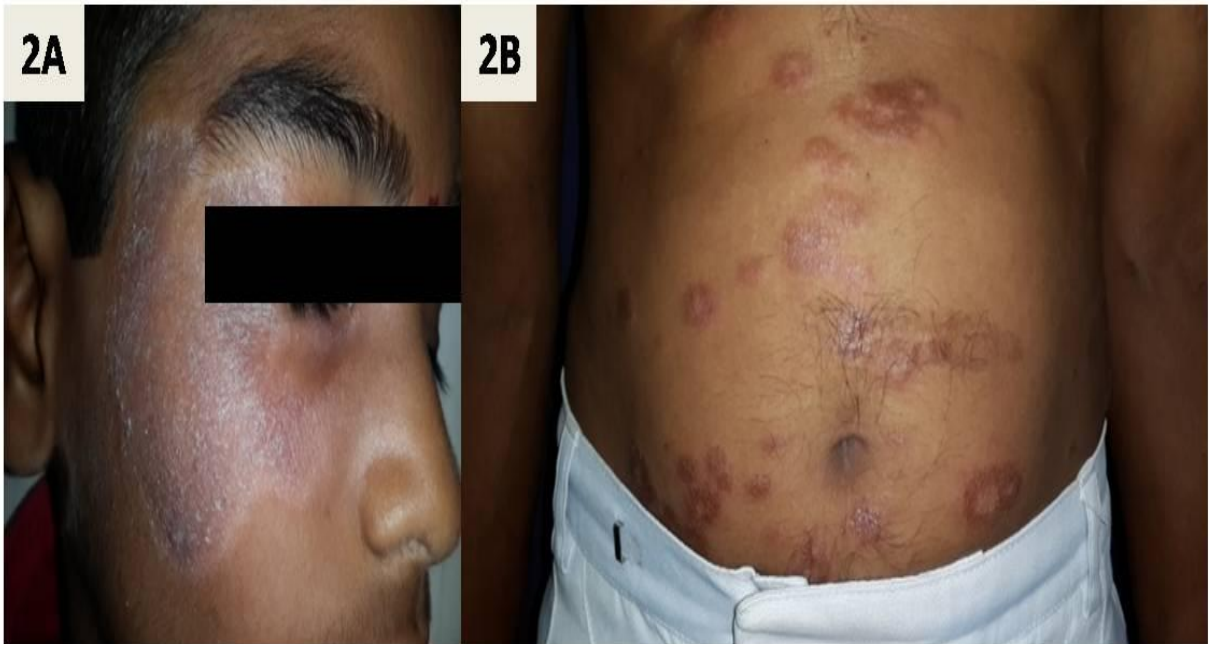


FIGURE 2: A- Clinical photograph of Tuberculoid leprosy, B- Clinical photograph of Borderline leprosy

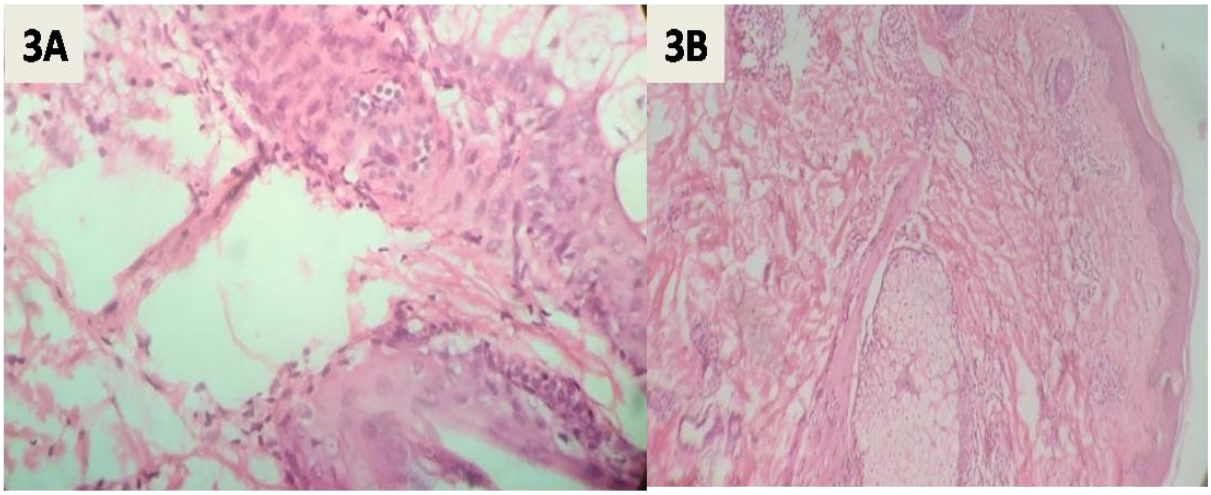
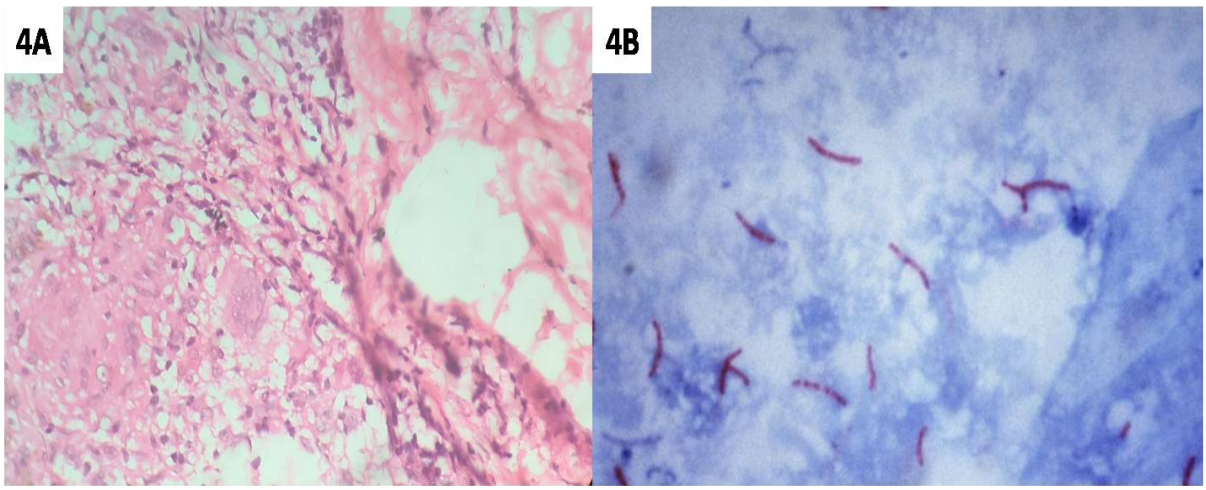


FIGURE 3:A-Photomicrograph of Borderline leprosy with collections of epitheloid cells around adnexae and no definite granuloma formation.(H&E,400x), B- Lepromatous leprosy with periadenexal, perivascular inflammatory infiltrate and presence of grenz zone (H&E,100x)



Legends:

FIGURE 4: A-Photomicrograph of tuberculoid leprosy with well formed granulomas, giant cells, absence of grenz zone(H&E, 400x).B- Staining for lepra bacilli revealing occasional scattered bacilli (H&E,400x).