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CLINICAL AND HISTOPATHOLOGICAL CORRELATION IN *LEPROSY*: A TERTIARY CARE HOSPITAL BASED STUDY

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Abstract: **Leprosy is a chronic infectious disease involving skin and peripheral nerves. It is present in different clinico-pathological forms depending upon immune status of the host. This study has been conducted to know the correlation between clinical and histopathological diagnosis of leprosy. This was a retrospective study conducted in department of Dermatology of tertiary care centre. All patients visiting to Dermatology out patient department during the period of January 2013 to May 2015 were enrolled in the study in whom leprosy was clinically diagnosed or suspected. Clinical and histopathological findings were retrieved from the records and analyzed. A total of 112 patients were studied, of them 64 (57.1%) patients were males and 48 (42.9%) females. Clinically borderline tuberculoid (BT) was diagnosed in 32 (28.5%), tuberculoid (TT) in 4 (3.5%), lepromatous (LL) in 8 (7.1%), borderline lepromatous (BL) in 4 (3.5%), indeterminate in 2 (1.7%) and relapse in 2 (1.7%) patients. Out of 112, type of leprosy could not be specified in 52 (46.4%) and in 8 patients classical clinical features were not noted, so Hansen's disease was kept as a differential diagnosis. On histopathological evaluation, epidermal changes were noted in 31.2% and dermal changes were following; granuloma (41.2%), dermal infiltrate (12.5%), adnexal infiltrate (8.1%), nerve infiltrate (10.7%), adnexal with nerve infiltrate (6.2%), perivascular with adnexal infiltrate (19.6%) and nonspecific (1.7%). Predominant dermal lympho-histioctytic infiltrates were seen in 50 percent of the cases. Borderline tuberculoid and tuberculoid was the most common histo-pathological diagnosis among patients with 28% and 48% respectively, followed by Indeterminate 16%, LL and BL 2.6% each. When clinical and histopathological diagnosis was correlated it was found that the parity was noted in TT, BT and LL were 66.6%, 56.2 % and 12.5% respectively. Three patients had leprosy out of 8, in which Hansen's disease was kept as a differential diagnosis. The study being retrospective the uniformity in clinical diagnosis and histopathological evaluation could not be assessed. With the limitations this study still give information about the importance of histopathology to diagnose Leprosy and for proper treatment.**

Keywords: **Leprosy, Histopathology, Ridley-Jopling.**

I. INTRODUCTION

Leprosy also called as Hansen's disease, is a chronic granulomatous, infectious disease involving skin and peripheral nerves.[1] The three cardinal signs of the disease are anaesthetic skin lesion, enlarged peripheral nerves and acid-fast bacilli in slit skin smear.[2] In India despite declaring leprosy elimination at national level in January 2006, it is still a disease of public health importance and endemic in few states.[3] It is a major public health problem of the developing countries with an estimated total global prevalence rate of 0.32 per 10,000 population in 2014 and India accounts for 1.27 lakhs new cases with prevalence rate of 0.68 per 10,000 population.[4] Leprosy presents in various clinico-pathological forms depending upon immune status of the host. The study of pathological changes help in understanding of disease, its complications and exact typing of disease.[5] According to Ridley and Jopling, lepsosy has been classified on the basis of

clinical, histopathological and immunological status of the host. Due to its clinical diversity and ability to mimic other disease sometimes leprosy is difficult to diagnose clinically. In such situations, histopathological examination is an important diagnostic tool to confirm diagnosis. This study was conducted to know the correlation between clinical and histopathological diagnosis of leprosy in a tertiary care hospital based scenario.[6]

II. MATERIALS AND METHODS

This was a retrospective study conducted in department of Dermatology of tertiary care centre in Gulbarga. We enrolled all the patients visiting to Dermatology out patient department between the period of January 2013 to May 2015, in whom leprosy was clinically diagnosed or suspected. The data were retrieved from the records maintained in the department including age, sex, residence, clinical diagnosis, histopathological findings and treatment and analyzed. To determine clinico- histopathological correlation of skin biopsies in leprosy, statistical evaluation SPSS version 11.5 was used. Chi square test and Fishers exact test was used for statistical significance and p value <0.05 was considered significant.

III. RESULTS

A total of 112 patients were studied of which 64 (57.1%) patients were males and 48 (42.9%) females. Age of the patients ranged from 8 years to 70 years. Mean age of patients was 35.85 +/- 2.021 years.

Out of 112 patients, clinically borderline tuberculoid was diagnosed in 32 (28.5%), tuberculoid in 6 (5.3%) lepromatous in 8 (7.1%) (Fig I) and borderline lepromatous in 2 (1.7%), indeterminate in 2 (1.7%) and relapse in 2 (1.7%) patients. In 52 (46.4%) cases leprosy could not be specified on clinical background and 8 (7.1%) cases, Hansen's disease was considered as differential diagnosis along with other clinical conditions (Table I). Slit skin smear was positive in 6 (5.3%) and negative in 44 (39.2%) but in 62 (55.3%) of cases reports could not be found.

Table I: Clinical diagnosis of study group.

Clinical diagnosis	Number of cases
TT	06 (5.3%)
BT	32 (28.5%)
BL	02 (1.7%)
LL	08 (7.1%)
Indeterminate	02 (1.7%)
Relapse	02 (1.7%)
Pure neural	00 (00%)
Not classified	52 (46.4%)
Hansen's disease as differential	08 (7.1%)

On histopathological evaluation of skin biopsies following changes were noted; epidermal thinning (11.6%), hyperkeratosis (8.9%), acanthosis (8%) and epidermal cleft (2.7%) however it was normal in 68.8% of patients. Interface dermatitis was seen in 3.5% cases and grenz zone in 7.1% cases . Of the total 112 patient, dermal changes seen were granuloma (41.2%), dermal infiltrate (12.5%), adnexal infiltrate (8.1%), nerve infiltrate (10.7%), adnexal with nerve infiltrate (6.2%), perivascular with adnexa infiltrate (19.6%) (fig II) and nonspecific (1.7%). Dermal infiltrates in 50% cases constituted of lympho-histiocytes followed by lymphocyte (35.7%), epitheloid cells (7.1%) and foamy cells (7.1%) . Of the 4 cases that had infiltrates seen in subcutaneous layer, 2 had giant cells and 1 each had lymphocytes and mixed cellular infiltrates. Periodic acid–Schiff stain (PAS) was positive in 3 (2.6%) patients. Fite stain was positive in 4 (3.5%) and negative in 10 (8.9%) cases. In 45 (40.1%) cases complete data could not be found.

In 75 (67%) patients leprosy was histopathologically confirmed and not in 37(33%) cases. In 34 patients non-specific (30.1%), vasculitis 1 (0.8) and Fungal infection 2 (1.7). Borderline tuberculoid and TT was the most common histopathological diagnosis among patients with 28% and 48% respectively, followed by indeterminate 16% and LL and BL 2.6% each. When clinical diagnosis and histopathological diagnosis was correlated it was found that the parity was seen in TT (66.6%), BT (56.2%), LL (12.5%), where it was not classified 71.1% , relapse 50% and Hansen's disease as differential 37.5%.

In our study we noted that indeterminate leprosy was diagnosed more histopathologically than clinical. There was no parity seen in BL, pure neural and indeterminate. One case of clinically diagnosed LL Hansen's disease was found to be TT on histopathology. Clinically where diagnosis was not specified in 71.1% patients had leprosy. Out of 8 patients, 3 had leprosy where Hansen's disease was kept as differential diagnosis. Details of the correlation between clinical and histopathological diagnosis is given in Table II.

Table II: Correlation between clinical and histological diagnosis

Clinical group	Histologic group							
	TT	BT	BL	LL	Indeterminate	Pure neural	Other than Hansen	% Parity
TT	4	1	0	0	0	0	1	66.6
BT	6	18	0	0	0	0	8	56.2
BL	0	1	0	0	1	0	0	0
LL	1	0	0	1	1	0	5	12.5
Pure neural	0	0	0	0	0	0	0	0
Indeterminate	0	0	0	0	0	0	2	0
Not classified	8	14	2	1	10	2	15	71.1
Relapse	0	1		0	0	0	1	50
Hansens as Differentials	2	1	0	0	0	0	5	37.5
Total	21	36	2	2	12	2	37	

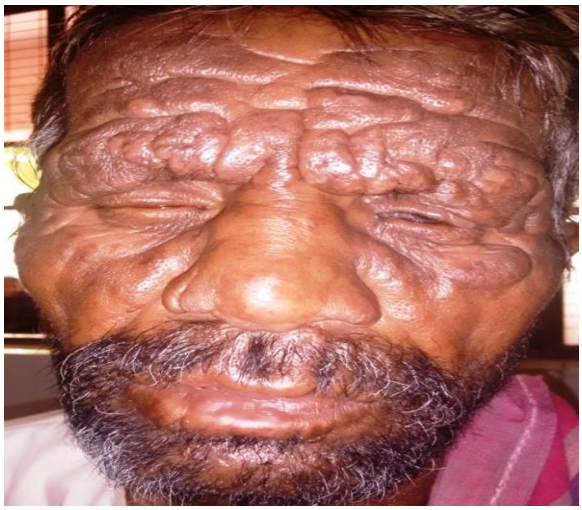

Fig I :Lepromatous leprosy patient with infiltrated lesions.

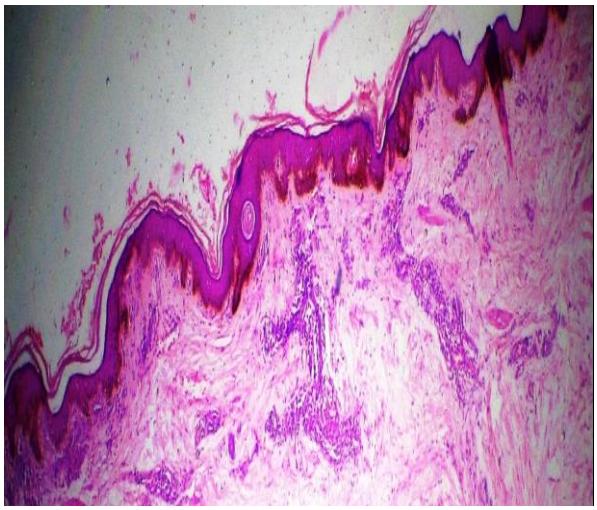

Fig II: Granuloma composed of histiocytes & epitheloid cells in tuberculoid leprosy

IV. DISCUSSION

Leprosy is still one of the major public health problems in developing countries like India. The Ridley and Jopling classification is a standard classification for diagnosis of leprosy which is based on clinical, histopathological and immunological status of the host. In our study clinico-pathological correlation was found in TT, BT, LL were 66.6%, 56.2%, 12.5% respectively and where it was no classified according to Ridley Joplings criteria found to be 67% which means clinically where Hansen's was suspected, it was confirmed histo-pathologically and these patients were treated and rendered noninfectious. On statistical analysis it was found to be significant ($p < 0.05$). Pandya et al found parity in 68.3%[7], Moorthy et al in 62.63%[8], Kar et al[9] in 70% and Jerath et al[10] in 68.5% . In most of these studies like moorthy et

al, Kar et al and Jerath et al found parity in TT pole and Mathur et al in LL pole.[8,9,10,15] Our study also found parity in TT and BT which is similar to Kar et al[9]and Jha et al[14]. There was lack of uniformity in clinical impression and clinical details in our study. Slit skin smear report was not available in 62 (55.3%). In dermal changes none of the reports described about exact location of the granuloma, whether infiltrating appendages or not. There were some interesting findings in our study like one case of LL was found to be histopathologically TT. In histopathological evaluation it was found that epitheloid giant cell granuloma was seen. But it was not mentioned it was eroding epidermis or not. Most of the indeterminate cases diagnosed histopathologically have periadnexal and perineural infiltrate. Moorthy et al[7] also found indeterminate type more histologically than clinically. Due to non specific histology it becomes difficult to diagnose indeterminate leprosy. It also depends upon factors like depth of the biopsy, quality of sections, number of sections examined and staining method including both hematoxylin and eosin and acid fast stain.[15-17] Clinically where diagnosis was not specified 71.1% had histopathological diagnosis of leprosy. Where Hansen's disease was kept as differential diagnosis three patients had leprosy. Most of the above studies have strictly followed Ridley Jopling classification but in our study it was not followed but still the percentage of parity is similar in their studies compared to our study. It is therefore important to have histopathological evaluation in suspected cases of leprosy mainly in the borderline spectrum and where slit skin smears are negative. Clinical information like site of lesion, type of lesion, nerve involvement, sensory impairment, treatment history along with immunological status of host is very important for the pathologist to correlate histopathologically. Histopathological diagnosis also depends on various factors like size of biopsy specimen, age of lesion, depth of biopsy, quality of section and very important inter-observer variation.[18]

V. CONCLUSIONS

There are certain limitations in our study. The study being retrospective the uniformity in clinical diagnosis and histopathological evaluation could not be assessed. Lastly we conclude that the spectrum of leprosy is very much overlapping hence histopathological examination should be done for confirmation of diagnosis and classifying the disease in all cases before starting treatment.

I/we believe the manuscript represents valid work. Neither this manuscript nor one with substantially similar content under my/our authorship has been published or is being considered for publication elsewhere, except as described in the covering letter.

I/we certify that all the data collected during the study is presented in this manuscript and no data from the study has been or will be published separately.

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