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ORIGINAL RESEARCH

Clinico-Histological Correlation in Leprosy: A Hospital Based Cross Sectional Study in Tertiary Care Center

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ABSTRACT

Background: Hansen's disease (leprosy) is a chronic infectious Granulomatous disease mainly affecting skin and peripheral nerves. There are varied clinical presentation & histopathological findings in leprosy which depends on the immunological status of the individual.

Aim: The aim of the present study is to determine the clinico-histopathological correlation of all suspected cases of leprosy using Ridly-Jopling system.

Materials & Methods: This is a hospital based cross sectional study done during the period of 1 year from July 2021 to June 2022.Skin biopsy samples received from clinically suspected leprosy patients were stained with H& E stain followed by fite-faraco stain for evaluation of lepra bacilli.

Results: Among the 58 clinically suspected cases of Hansen's disease, 48 cases shows evidence of leprosy in histopathological examination with a clinico – histopathological correlation rate of 83%. On histopathological examination majority of cases were of Borderline tuberculoid (32%) followed by Lepromatous leprosy (14%). Borderline borderline (BB) gives maximum clinico-histopathological correlation (92%) and Borderline Lepromatous (BL) shows minimum clinico-histopathological correlation.

Conclusion: For accurate classification of disease, correlation between clinical, histopathological and microbiological findings is very crucial. Early clinical diagnosis is cornerstone for Leprosy eradication program. Therefore, all clinically suspicious cases must be followed by histopathological examination of the skin biopsy samples.

Keywords: Clinico-Histological, Correlation, Hansen's Disease, Borderline Lepromatous Leprosy, Ridly-Jopling System.

INTRODUCTION

Although rare in developed nation, Hansen's disease is still a major health burden in developing nation like India.[1] Hansen's disease is a slowly progressive chronic

granulomatous infectious disease mainly affecting peripheral nerves and skin. It is caused by *Mycobacterium leprae.* There are different clinical presentation and histopathological findings in Hansen's disease which depends on the immune status of the patient.[2] The prevalence of leprosy is high in tropical and sub-tropical region. Several classification systems have been proposed for Hansen's disease which are based on bacteriological, clinical, histopathological and immunological status of the individual patient. But the classification proposed by Ridley-Jopling in 1966 proved to be most useful. According to Ridley-Jopling system, Leprosy is classified as Tuberculoid Tuberculoid (TT), Borderline Tuberculoid (BT), Borderline Borderline (BB), Borderline Lepromatous (BL) and Lepromatous Lepromatous (LL).[3]The term borderline is used to denote pattern that show some features of both Tuberculoid and Lepromatous leprosy.

Patients with Lepromatous lepromatous (LL) and Tuberculoid tuberculoid (TT) leprosy are stable, tuberculoid (TT) often self-healing and lepromatous (LL) remain heavily infected unless given appropriate therapy. Borderline borderline (BB) is the most unstable with most patients downgrade to Lepromatous lepromatous (LL) in untreated cases. The term Indeterminate leprosy is used to describe the patient presenting with very early leprosy lesion that cannot be categorise along the immunological spectrum. WHO has proposed another classification system in 1982 based on Bacteriological index and clinical findings as Multibacillary (MB) and Paucibacillary (PB) leprosy. Borderline Tuberculoid (BT), Tuberculoid tuberculoid (TT), Indeterminate cases were classified as Paucibacillary and Lepromatous leprosy (LL), Borderline lepromatous (BL) and Borderline borderline (BB) were classified as Multibacillary (MB).[4]Based on this classification, therapy for Multibacillary (MB) leprosy is given if Bacterial Index (BI) >/= 2 at any skin site and therapy for Paucibacillary (PB) leprosy is given if Bacterial Index (BI) < 2. Again in 1988, a positive skin smear at any site became sufficient to start treatment for Multibacillary (MB) leprosy.[5]

Accurate diagnosis of leprosy involves not only detailed clinical examination of the skin lesion and peripheral nerves but also slit skin smear examination and histopathological examination as well as demonstration of AFB bacilli.[6] The present study was done to evaluate the concordance between clinical and histopathological diagnosis in suspected cases of Leprosy using Ridley-Jopling system.

MATERIALS AND METHODS

The present study is a hospital based prospective cross-sectional study done in the Department of Pathology, Tezpur Medical College and Hospital, a tertiary care hospital located in north-eastern India during the period of 1 year from July 2021 to June 2022.

Skin biopsy samples received from clinically diagnosed patient were the study material in the present study. Only newly diagnosed cases were included in the study and old treated patients or patients on therapy were excluded from the study. All patients were examined regarding site, number, colour margin, surface and loss of sensation including deformities. Written consent was taken from all the patients.

Biopsy was performed from the margin of the skin lesion and immediately fixed in 10% Neutral Buffer Formalin. Biopsy sample was routinely processed and paraffin embedded for section followed by Hematoxylin and Eosin staining.

All biopsy samples were stained with Fite-Faraco stain for leprosy bacilli. Cases were classified as Tuberculoid tuberculoid (TT), Borderline tuberculoid (BT), Borderline borderline (BB), Borderline lepromatous (BL), Lepromatous lepromatous (LL) on the basis of histological finding according to Ridley-Jopling system.

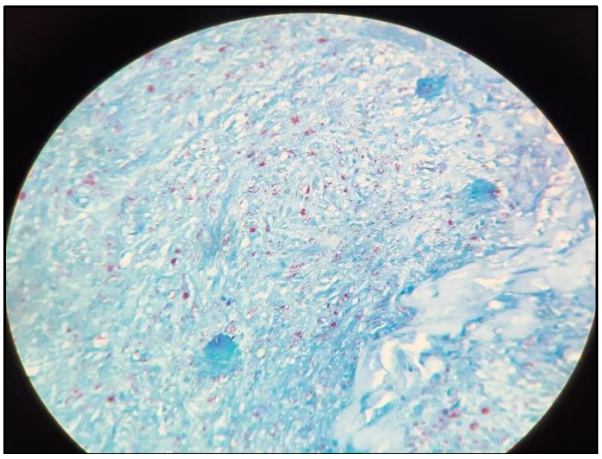

Fig 1: Fite faraco stain showing lepra bacilli

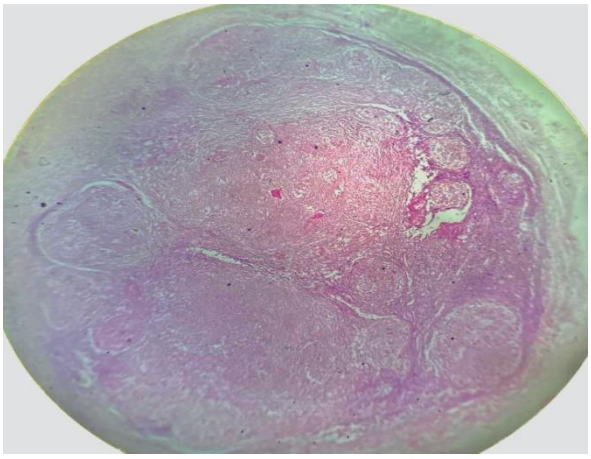

Fig 2: Tuberculoid leprosy showing multiple granuloma

RESULTS

58 clinically diagnosed and untreated patient whose skin biopsy were performed were included in the present study. Age group of the patient ranged from 18 years to 75 years with median age 42 years. Male outnumbers female patient with male: female ratio of 2:1. Majority of the patient belonged to 21 to 30 years. Skin macule was the most common presentation. Amongst the 58 clinically suspected cases of Leprosy, 48 cases show evidence of Leprosy with a clinic-histopathological correlation rate of 83%. On histopathological examination majority of cases were Borderline tuberculoid (32%) followed by Lepromatous leprosy (14%). Borderline borderline (BB) gives maximum clinico-histopathological correlation (92%) and Borderline lepromatous (BL) shows minimum clinico-histopathological correlation.

Fite-Faraco stain shows positive results in 26 cases. Among the cases of Lepromatous (LL) leprosy, were positive for Fite-Faraco stain. All Tuberculoid (TT) and Borderline tuberculoid (BT) cases were negative for Fite-Faraco stain.

DISCUSSION

Hansen's disease is a chronic infectious disease with varied clinical and histopathological findings depending on the immune status of the patients. In the present study, Leprosy cases were classified according to Ridley-Jopling system of classification into Lepromatous lepromatous (LL), Borderline lepromatous (BL), Borderline borderline (BB), Borderline tuberculoid (BT) and Tuberculoid tuberculoid (TT).

The predominance for Hansen's disease in the present study is supported by study done by Manandhar *et.al*[2] and Vargas-Ocampo**.**[7] This may be due to the fact that males are more prone to exposure to Lepra bacilli due to increase job related mobility.

A clinic-histological correlation of 93% was observed in the present study. Similar findings were reported by Mathur *et al*[8] who obtained 80.4% and Banushree *et al.*[9]

Macule in the skin was most common clinical finding in the present study. But according to Manandhar *et al*[2] skin plaque was the most common finding. This discordant observed may be due to the fact that there was less number of cases in their study.

In the present study, Borderline tuberculoid (BT) was the most common histopathological finding followed by Lepromatous lepromatous (LL) leprosy. Manandhar *et al*[2] and Banushree *et al*[9]also reported Borderline tuberculoid (BT) as most common type of leprosy in their study. The predominance of BT may be due to the fact that increase accessibility and earlier detection of cases. Highest clinicohistological correlation was observed in Borderline (BB) leprosy and least was observed in Multibacillary (MB). This may be due to the fact that Borderline leprosy are immunologically and clinically very unstable.

All cases of Lepromatous (LL) leprosy were positive for Fite-Faraco stain which was supported by Semwal *et al*[10]and Banushree *et al*.[9]

In the present study, 11 clinically suspected cases of leprosy couldn't be categorized into Ridley Jopling System.

Although according to Ridley Jopling System of Leprosy there are specific histopathological findings in each category with overlapping features occurring in each category specially in Borderline Category which is immunologically most unstable. Therefore, it is of utmost importance to correlate histopathological features with clinical findings. Therefore, logical approach for correct diagnosis is to amalgamate clinical features with histopathological and microbiological findings, which will help to start accurate therapy and prevention of detrimental effects associated with the disease. Clinic-histopathological correlation is also very important for monitoring the therapy and relapse. although the burden of Leprosy is decreasing after the introduction of Multi Drug Therapy, but still lots of patients are still living with the disease particularly in developing nation.

CONCLUSION

For accurate classification of disease, correlation between clinical, histopathological and microbiological findings are very crucial. Early clinical diagnosis is cornerstone for Leprosy eradication program. Therefore, all clinically suspicious cases must be followed by histopathological examination of the skin biopsy samples.

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