

Original article:

Analysis of Histopathological Spectrum of Leprosy: An Institutional Based Study

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Abstract:

Background: Leprosy is a chronic granulomatous infectious disease caused by noncultivable *Mycobacterium leprae*. The present study was conducted to study histopathological spectrum of leprosy at tertiary care hospital.

Materials & methods: The present study was conducted to study histopathological features of skin biopsy specimens from 100 clinically diagnosed leprosy patients. A detailed clinical history and examination findings were collected. Gross examinations of biopsies were done. Histopathological features and the bacteriological status were noted.

Results: Among total 100 skin biopsies, on histopathological examination, the most common type seen was lepromatous leprosy comprised of 34% cases, followed by tuberculoid leprosy with 19% cases. Fite-Faraco staining to identify acid-fast bacilli (AFB) was done in all 100 cases. It was positive in 49% of cases. All cases of Lepromatous leprosy and Histoid types showed presence of acid-fast bacilli.

Conclusion: The present study concluded that on histopathological examination, the most common type of leprosy seen was lepromatous leprosy. Fite-Faraco staining to identify acid-fast bacilli (AFB) shows that it was positive in 49% of cases. All cases of Lepromatous leprosy and Histoid types showed presence of acid-fast bacilli.

Keywords: Leprosy, granulomatous infectious disease, *Mycobacterium leprae*.

INTRODUCTION

Leprosy is one of the oldest diseases known to man. It is a chronic infectious disease caused by *Mycobacterium leprae* (*M. leprae*). Hansen's disease was discovered by Sir Gerhard Armauer Hansen in 1873.¹ Although, leprosy had already been described in *Susruth Samhita* (600 BC).² It is a granulomatous disease primarily affecting the skin and peripheral nerves. It can also involve muscles, eyes, bone, testis and internal organs to a varying extent.³ Since ancient times Leprosy is known as "Kushtaroga."⁴ *Mycobacterium leprae* causes leprosy, which can be spread by inhaling bacilli that may be expelled from a patient's nasal passages. The specific route of transmission is yet unknown. When inhaled as droplets, the organisms are phagocytosed by the macrophages in the lung and disseminated throughout the circulatory system. It only replicates in tissues with comparatively lower temperature, so it typically affects the skin and nerves, though cases have also been reported involving the muscles, eyes, bones,

testicles, and other deep-seated organs.⁵ According to a modified version of Ridley and Jopling's classification, leprosy is divided into five clinico-pathologic groups: TT—Tuberculoid Polar (High resistance), BT—Borderline Tuberculoid, BB—Mid Borderline (dimorphic), BL—Borderline Lepromatous, and LL—Lepromatous Polar (Low resistance).⁶ Precise criteria for histological typing of leprosy was laid down by Ridley and Jopling in 1966.⁶ The present study was conducted to study histopathological spectrum of leprosy at tertiary care hospital.

MATERIAL AND METHODS

The present study was conducted in the Department of Pathology, Meenakshi Medical College Hospital and Research Institute, Kanchipuram, Tamil Nadu (India) to study histopathological features of skin biopsy specimens from 100 clinically diagnosed leprosy patients, in a tertiary care hospital. All the clinically diagnosed cases of leprosy were included in the study. Inadequate biopsies, inconclusive reports and poorly preserved biopsy were excluded from study. Biopsies were taken from representative lesions and sent to histopathology section in glass or plastic vials containing 10% formalin solution. A detailed clinical history and examination findings were collected. Gross examinations of biopsies were done. Biopsies were fixed as early as possible by 10% neutral buffered formalin and processed preferably within 24 hours. Following fixation, the tissues were processed, embedded in paraffin and serial sections of 4-5 microns were obtained, which were stained with Hematoxylin and Eosin for assessment and with Zeihl Nielsen for identification of the bacilli. Histopathological features and the bacteriological status were noted.

RESULTS

Among total 100 skin biopsies, on histopathological examination, the most common type seen was lepromatous leprosy comprised of 34% cases, followed by tuberculoid leprosy with 19% cases.

Fite-Faraco staining to identify acid-fast bacilli (AFB) was done in all 100 cases. It was positive in 49% of cases. All cases of Lepromatous leprosy and Histoid types showed presence of acid-fast bacilli.

Table 1: Distribution of Lepromatous lesions according to histology

Lepromatous lesions	N(%)
Lepromatous leprosy	34(34%)
Tuberculoid leprosy	19(19%)
Borderline tuberculoid leprosy	15(15%)
Borderline lepromatous leprosy	15(15%)
Indeterminate leprosy	8(8%)
Histoid leprosy	7(7%)
Erythema nodosum leprosum (ENL)	2(2%)
Total	100(100%)

Table 2: Distribution of FF stain positivity in individual histological type of leprosy cases

Type of leprosy	Number of Fite-Faraco positive cases	(%)
Lepromatous leprosy	34	100%
Borderline tuberculoid leprosy	2	13.33%
Borderline lepromatous leprosy	6	40%
Histoid leprosy	7	100%

DISCUSSION

Leprosy is a chronic granulomatous disease caused due to infection by *M. leprae*. Depending upon the immune status of the host; leprosy can have varied clinico-pathological presentations. Accurate diagnosis and classification are important for correct timely treatment, management and prevention of disabilities. There are various classification systems like India, Madrid, Ridley-Jopling classification, etc., The most widely used Ridley-Jopling classification is based on clinical, bacteriological, pathological and immunological parameters.⁷

Among total 100 skin biopsies, on histopathological examination, the most common type seen was lepromatous leprosy comprised of 34% cases, followed by tuberculoid leprosy with 19% cases. Fite-Faraco staining to identify acid-fast bacilli (AFB) was done in all 100 cases. It was positive in 49% of cases. All cases of Lepromatous leprosy and Histoid types showed presence of acid-fast bacilli.

Histopathological examination with FF stain of 189 cases showed the presence of lepra bacilli in 98 (51.85%), whereas no bacilli in 91 (48.14%) cases. All 100% cases of TT showed no lepra bacilli, whereas mid-borderline, BL, LL, and HL showed the presence of bacilli in 100% of cases.⁸

A study conducted by Kaur I et al., observed LL type to be the commonest type in their series⁹ while, Mathur MC et al., found TT to be the most common type.¹⁰

In the study by Bhatia et al, the concordance between the clinical and histopathological diagnosis for different type of leprosy was different with lepromatous form showing maximum correlation (91%), and mid borderline showing the least (26%). When some of the types were combined (BT with TT and BL with LL), the overall concordance figure was 76%; concordance for TT/BT was 80%, for BL/LL group was 93%.¹¹

A study of histopathological correlation of skin biopsies in 15 leprosy done by BN Moorthy et al showed that the correlation was highest in LL (80%), followed by BL (70%), BT (66.34%), BB (50%) and TT (46.15%).¹²

CONCLUSION

The present study concluded that on histopathological examination, the most common type of leprosy seen was lepromatous leprosy. Fite-Faraco staining to identify acid-fast bacilli (AFB) shows that it was positive in 49% of cases. All cases of Lepromatous leprosy and Histoid types showed presence of acid-fast bacilli.

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