Study of histomorphological variants of leprosy in correlation with bacilloscopy index in tertiary care hospital

Alpeshpuri P Goswami¹, Nutanbala N Goswami², Abhijit S. Khandkar³, Umeshkumar Zinzala⁴

¹²Associate Professor, ³⁴Resident Doctor, ¹³⁴Dept. of Pathology, ²Dept. of Pharmacology, Government Medical College, Bhavnagar, Gujarat, India

*Corresponding Author: Nutanbala N Goswami
Email: drnutangoswami78@gmail.com

Abstract

Introduction: Leprosy is an infectious and contagious chronic disease, caused by Mycobacterium leprae, an obligate intracellular bacillus, that affects mainly the skin, nerves and mucous membranes. It can also affect the eye, nose, joints, lymph nodes, internal organs and bone marrow, especially in multibacillary patients (MB). In the majority of cases, it is transmitted from person to person through contact with patients having a high bacillary index and haven't been treated.

Materials and Methods: This is an observational retrospective study of 52 cases conducted in histopathology section of Pathology department, Government Medical college, Bhavnagar, Gujarat. In this study, cases were included whose biopsy samples were received in the department with clinical suspicion of leprosy. All the case diagnosed as leprosy were evaluated by Fite Faraco stain and reported for bacilloscopy index.

Results: Out of 52 cases, 40 were histomorphologically confirmed as leprosy. Maximum number of cases were observed in the age group of 31 to 40 years (47.5%). Among various anatomical site for cutaneous presentation of leprosy in maximum number of cases, the lesions were observed in upper extremity (50%). Higher number of type of leprosy observed were borderline tuberculoid leprosy (35%) followed by tuberculoid leprosy (30%). It is observed, mean bacilloscopic index is higher in cases of lepromatous leprosy whereas lower in tuberculoid leprosy.

Conclusion: In our study, borderline tuberculoid and tuberculoid cases were reported with higher incidence. Bacteriological examination and bacilloscopy index add onto the morphological diagnosis and help to categorise multibacillary and paucibacillary leprosy.

Keywords: Leprosy, Bacilloscopy index, Fite Faraco.

Introduction

Leprosy is an infectious and contagious chronic disease, caused by Mycobacterium leprae, an obligate intracellular bacillus, that affects mainly the skin, nerves and mucous membranes.¹² It can also affect the eye, nose, joints, lymph nodes, internal organs and bone marrow, especially in multibacillary patients (MB).¹² In the majority of cases, it is transmitted from person to person through contact with patients that have a high bacillary index and haven't been treated.¹²

The disease has a 2- to 5-year course for paucibacillary patients and a 5- to 10- year course for multibacillary patients.³ Humans are the main natural reservoir of the bacillus. MB patients are considered the main source for infection in transmission cycle. Although there is evidence of the presence of M. leprae in skin lesions, breast milk, environment and animals, the main route of transmission for M. leprae is the respiratory tract.²⁴⁵ During disease evolution, reactions might occur that, without proper treatment, can lead to severe damage in the peripheral nerve trunks, originating physical disabilities and sequelae, the main reason for the stigmatization caused by the disease.⁶

The Ziehl-Neelsen and Kinyoun methods remain reliable ways to visualize the presence of acid-fast bacteria in human exudates smears. However, a more recent adaptation of the Kinyoun staining method, the Fite-Faraco method, is currently the preferred staining procedure to identify M. leprae in human tissues. The main adaptation in the Fite-Faraco method is the dilution of the solvent xylene in the vegetable oils used during the deparaffinization step, because M. leprae is much less acid- and alcohol-fast than M. tuberculosis and thus can easily be missed in the examination of the slide.

Materials and Methods

This is an observational retrospective study conducted in histopathology section of Pathology department, Government Medical college, Bhavnagar, Gujarat. Data was collected from laboratory information system between January to October 2019, recorded and analysed to study. In this study total 52 cases were included whose biopsy samples were received in the department with clinically suspicious cases of leprosy. Requisition form with inadequate clinical information were excluded from the study. All the specimen were sectioned, processed and stained by H and E staining and reported for bacilloscopy index. In this study, cases were included whose biopsy samples were received in the department with clinical suspicion of leprosy. All the specimen were sectioned, processed and stained by H and E staining. For that reason, the correct histological analysis is time consuming and laborious. The number of bacilli identified by this method, together with the clinical and histopathological features, helps classify the disease form. The Ridley and Jopling classification of leprosy utilizes the bacilloscopic index, varying from a score of 0 to...
6, and is based on a logarithmic scale in which 0 represents the absence of bacillus; 1+ represents 1–10 bacilli in 100 fields; 2+, the presence of 1–10 bacilli in 10 fields; and 3, 4, 5, and 6+ represent the identification of 1–10, 10–100, 100–1000, and >1000 bacilli per field, respectively. Histomorphological type of leprosy and bacilloscopy index were studied, analysed and recorded for the consistent correlation.

**Result**

**Table 1:** Correlation between age group and anatomical lesions in clinically suspicious cases of leprosy

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Upper extremity</th>
<th>Head and neck</th>
<th>Trunk and back</th>
<th>Lower extremity</th>
<th>Total * (out of 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>03</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0</td>
</tr>
<tr>
<td>21-30</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>01</td>
<td>03(7.5%)</td>
</tr>
<tr>
<td>31-40</td>
<td>08</td>
<td>03</td>
<td>03</td>
<td>05</td>
<td>19 (47.5%)</td>
</tr>
<tr>
<td>41-50</td>
<td>10</td>
<td>02</td>
<td>02</td>
<td>03</td>
<td>15 (37.5%)</td>
</tr>
<tr>
<td>&gt;50</td>
<td>01</td>
<td>02</td>
<td>01</td>
<td>02</td>
<td>03 (7.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>20(50%)</td>
<td>05(12.5%)</td>
<td>04(10%)</td>
<td>11(27.5%)</td>
<td>--</td>
</tr>
</tbody>
</table>

*Histomorphologically diagnosed as leprosy.

Table 1 showing out of 52 cases suspicious for clinically diagnosed leprosy, maximum number of cases were observed in the age group of 31 to 40 years (47.5%). Among various anatomical site for cutaneous presentation of leprosy in maximum number of cases, the lesions were observed in upper extremity. This cases were biopsied to confirm histomorphology. All the cases were studied and results were recorded as table 2.

**Table 2:** Correlation between histomorphological type of leprosy with bacilloscopic index. (Fite faraco stain)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Histomorphological type of leprosy</th>
<th>Number of cases</th>
<th>Mean bacilloscopic index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lepromatous leprosy</td>
<td>6(15%)</td>
<td>4.83</td>
</tr>
<tr>
<td>2</td>
<td>Borderline lepromatous leprosy</td>
<td>5(12.5%)</td>
<td>3.6</td>
</tr>
<tr>
<td>3</td>
<td>Intermediate leprosy</td>
<td>2(5%)</td>
<td>1.75</td>
</tr>
<tr>
<td>4</td>
<td>Borderline tuberculoid leprosy</td>
<td>14(35%)</td>
<td>1.2</td>
</tr>
<tr>
<td>5</td>
<td>Tuberculoid leprosy</td>
<td>12(30%)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Indeterminant leprosy</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>Histoid leprosy</td>
<td>1(2.5%)</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Histomorphological findings other than leprosy</td>
<td>12</td>
<td>--</td>
</tr>
</tbody>
</table>

Table 2 showing out of 52 biopsy examined, 40 cases were confirmed histomorphologically as cases of various types of leprosy. Higher number of type of leprosy observed were borderline tuberculoid leprosy (35%) followed by tuberculoid leprosy (30%). All the cases diagnosed as various types of leprosy were undergone for Fite Faraco special stain to confirm the diagnosis and to get bacillary load. In one case diagnosed as histoid leprosy, bacilloscopic index was 7+. It is observed mean bacilloscopy index is higher in cases of lepromatous leprosy whereas lower in tuberculoid leprosy. 2 cases were histomorphologically diagnosed as tubercular leprosy and on FF stain observed bacilloscopic index 0+.

**Fig. 1:** Lepromatous leprosy (H & E stain, 40x showing foamy macrophages & clear subepidermal zone)
From its introduction in 1982 to till date, the same three drugs constitute MDT for leprosy, and with emerging resistance to these drugs, there is a need to expand the repertoire of drugs to treat leprosy.

Conclusion
Leprosy is one of the oldest diseases known to man. Despite advances in all spheres of medical science, leprosy continues to be a public health challenge in countries like India. In our study carried out at tertiary care hospital, borderline tuberculoid and tuberculoid cases were reported with higher incidence. Bacteriological examination and bacilloscopy index add onto the morphological diagnosis and helps to categorise multibacillary and pauci bacillary leprosy. We recommend it to avoid false over and under diagnosis of leprosy cases.

Source of funding
None.

Conflict of interest
None.

References

How to cite this article: Goswami AP, Goswami NN, Khandkar AS, Zinzala U. Study of histomorphological variants of leprosy in correlation with bacilloscopy index in tertiary care hospital. Indian J Pharm Pharmacol 2019;6(4):149-51.