Clinico-Pathological Co-relation in Leprosy
B Mehta, N Desai, S Khar

Citation

Abstract
Introduction:Leprosy is an important communicable disease caused by M. leprae, and one of the major health problems of developing countries like India. Most of the time, clinical judgment is adequate for diagnosis. But in some, especially early and borderline cases of leprosy histopathology, the study of epidemiological and demographic factors can be important.

Method:The aim of the present study is to study epidemiological and demographic factors among patients of leprosy to describe the clinical pattern of the disease, and to correlate clinical diagnosis with histopathological findings with AFB (acid-fast bacilli – M. leprae) status. A total of 100 cases were studied. A detailed history was taken, and a complete examination of the patient was carried out, including general, local and systemic examinations. The biopsies were taken and stained using the routine haematoxylin-eosin method 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.

Results:The study shows that 34 patients (34%) belonged to a sexually active age group i.e., 21-30 years (Table-1). The highest number of cases (29%) were clinically diagnosed as borderline tuberculoid (BT), followed by tuberculoid (TT) (24%), borderline leprosy (BL) (21%), lepromatous leprosy (LL) (20%) and the fewest cases were mid-borderline leprosy (BB) (6%). 26% of patients were histologically diagnosed as TT and BT, followed by BL (25%), LL (20%) and BB (03%). Modified Fite-Faraco stain for AFB in skin biopsy were negative in TT (26%), BT (26%) and BB (03%) cases. 21 out of 25 cases of BL and 19 out of 20 cases of LL were positive for AFB.

Discussion:This age difference may be due to differences in exposure, opportunities for infection and immunological differences in children and adults. Histopathological examination in leprosy increases the accuracy of diagnosis whereas clinical features indicate only the gross morphology of lesion caused by underlying pathological changes, since tissue response varies in disease spectrum due to the availability of CMI.

Key Message: Correlation of clinical and histopathological features along with bacteriological index appears to be more useful for accurate typing of leprosy than considering any of the single parameters alone.

INTRODUCTION
Leprosy is an important communicable disease caused by M. leprae, one of the major health problems of developing countries like India. The organism has a special predilection for the skin and peripheral nerves and resides mainly within cells of mononuclear phagocytic series. Lepromatous leprosy patients are the most important reservoirs of infection.

Most of the time clinical judgment is adequate for diagnosis. But in some, especially early and borderline cases of leprosy, histopathological examination is required. The mislabeling of a case can lead to inadequate therapy, which may be disastrous to the case and also to the society. So, clinicopathologic correlation of leprosy cases assumes a pivotal role not only for early diagnosis but also for proper labeling of cases.

METHOD
The aim of the present study is to study epidemiological and demographic factors among patients of leprosy, to describe the clinical pattern of the disease, and to correlate clinical diagnosis with histopathological findings with AFB (acid-fast bacilli – M. leprae) status.

A total of 100 cases were studied. The history was taken in detail, and complete examination of patients was carried out, including general, local and systemic examination, particularly with reference to skin, nerves and sensory disturbances. Relevant past and family history was asked. Deformities were graded as per the WHO (1998) grading system.

The biopsies were taken from the most active and untempered lesions. It included the margin of the lesion and was sent to the Pathology Department in 10% formalin.
bulbs. The biopsy specimens were processed as per standard procedure, and serial sections were stained using the routine haematoxylin-eosin method 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.\textsuperscript{7,8,9,10}

The clinical charts and histopathological reports of these 100 cases were examined. All data pertaining to age, sex, clinical and histopathological classification of the type of leprosy were collected and analyzed using standard statistical techniques.

**RESULTS**

The study shows that 34 of the patients (34%) belonged to a sexually active age group, i.e. 21-30 years (Table-1). The male-to-female ratio was 2.3:1. 73% of the patients were married. 83% of the patients were illiterate, 12% had a primary education and 5% had a secondary or higher education. The majority of the patients (92%) belonged to lower socioeconomic class; 7% belonged to the middle class and only 1% to upper class. Family history of leprosy was positive in 8% patients. Grade I deformity was present in 40% of patients; 13% of patients had grade II deformities. The highest number of cases (29%) were clinically diagnosed as borderline tuberculoid (BT), followed by Tuberculoid (TT) (24%), borderline leprosy (BL) (21%), lepromatous leprosy (LL) (20%) and the least were mid-borderline leprosy (BB) (6%). 26% of patients each were histologically diagnosed as TT and BT, followed by BL (25%), LL (20%) and BB (3%). Modified Fite-Faraco stain for AFB in skin biopsy was negative in TT (26%), BT (26%) and BB (3%) cases. 21 out of 25 cases of BL and 19 out of 20 of LL were positive for AFB. Maximum parity in clinicohistological correlation was seen in LL (90%), followed by TT (75%), BL (71.4%), BT (58.6%) and lastly, BB (33.3%). BB cases showed maximum disparity (66.7%).

**Figure 1**

Table – 1: age wise distribution of cases

<table>
<thead>
<tr>
<th></th>
<th>0 – 10 (Yrs)</th>
<th>11 – 20</th>
<th>21 – 30</th>
<th>31 – 40</th>
<th>41 – 50</th>
<th>51 – 60</th>
<th>60 and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>02 (02%)</td>
<td>10 (10%)</td>
<td>34 (34%)</td>
<td>25 (25%)</td>
<td>17 (17%)</td>
<td>08 (08%)</td>
<td>04 (04%)</td>
</tr>
</tbody>
</table>

**Figure 2**

Table – 2: sex wise distribution of cases

<table>
<thead>
<tr>
<th>SEX</th>
<th>NO. OF CASES</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>FEMALE</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

**Figure 3**

Table – 3: distribution of leprosy cases

<table>
<thead>
<tr>
<th>TYPE</th>
</tr>
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<tbody>
<tr>
<td>TT</td>
</tr>
<tr>
<td>BT</td>
</tr>
<tr>
<td>BB</td>
</tr>
<tr>
<td>BL</td>
</tr>
<tr>
<td>LL</td>
</tr>
<tr>
<td>P. Ed.</td>
</tr>
<tr>
<td>%</td>
</tr>
<tr>
<td>%</td>
</tr>
<tr>
<td>%</td>
</tr>
</tbody>
</table>

**Figure 4**

Table – 4: clinical and histopathological co-relation

<table>
<thead>
<tr>
<th>CLINICAL TYPE</th>
<th>NO. OF CASES</th>
<th>H. P. TYPE</th>
<th>% PARITY</th>
<th>% DISPARITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT</td>
<td>24 (24%)</td>
<td>18</td>
<td>06</td>
<td>06</td>
</tr>
<tr>
<td>BB</td>
<td>06 (06%)</td>
<td>-</td>
<td>-</td>
<td>06</td>
</tr>
<tr>
<td>LL</td>
<td>15 (15%)</td>
<td>03</td>
<td>03</td>
<td>25</td>
</tr>
</tbody>
</table>

**Figure 5**

Borderline tuberculoid leprosy showing scanty giant cells (H. & E. Stain - 10X)
DISCUSSION

This age difference may be due to differences in exposure,
Clinico-Pathological Co-relation in Leprosy

opportunities for infection and immunological differences in children and preponderance. Similar findings were recorded by the NLEP in 2007. 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 socioeconomic status reflects that leprosy is a disease of the poor and overcrowding of homes. Family history was positive in siblings, which shows that there is direct transmission by contact in the family when the source and susceptible individual are close to each other. Deformities are more common in the tuberculoid type, as reflected in our study, which depicts the distribution of leprosy cases according to clinical diagnosis. The present study shows the highest number of cases in BT type and the least number of cases in BB type. The low number of cases in BB type in the present study confirms the immunological instability of this type of patient. The least cases were histopathologically diagnosed as mid-borderline (BB) group, indicating that it is unstable.

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 highest in borderline cases.

The polar forms of leprosy, i.e. TT and LL, have disparities of 25% and 10% respectively. These are the stable forms of leprosy, meaning that the CMI is stable. In such cases, histopathological variation is also minimal.

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 CMI.

As the disparity was highest in borderline cases, if a borderline leprosy clinically appears to be paucibacillary, then a substantial histopathology is necessary to label it as a BB case. It is logical to accept some disparity between the clinical and histopathological features as borderline leprosy is an “unstable” form of leprosy in the CMI spectrum.

CONCLUSION

One serious matter is that the commonest age group is 21-30 years, indicating that leprosy is still affecting the youth, which directly correlate with a country’s economy and growth.

As per the present epidemiological data, it suggests that leprosy is a disease of poverty, overcrowding and lower socioeconomic status.

The present study has shown disparity in clinical and histological diagnosis, especially in borderline group, due to variation in cell-mediated immunity. Because of this, clinically a PB case which is actually a MB case on histopathological examination may be put on PB therapy and given inadequate treatment. FF stain can help in the proper labeling of a case on the leprosy spectrum. Thus, correlation of clinical and histopathological features along with bacteriological index appears to be more useful for accurate typing of leprosy than considering any of the single parameters alone.

References

Author Information

Bhavesh Mehta
Professor and Head, Skin and VD Department, Shree M.P. Shah Government Medical College

N.J. Desai
Professor, Pathology Department, Shree M.P. Shah Government Medical College

Shital Khar
Tutor, Pathology Department, Shree M.P. Shah Government Medical College