Leprosy Scenario at a Tertiary-level Hospital in Navi Mumbai: A Four-year Retrospective Study

Kenit P Ardeshna, Shylaja Someshwar, Shaurya Rohatgi, Ami R Dedhia, Hemangi R Jerajani

ABSTRACT

Introduction: India was among the last few countries in the world to achieve leprosy elimination in 2005. However, wide variations in prevalence rates continue to exist across the states and regions in the country.

Aims: The purpose of the study is to determine the current clinical profile of leprosy from a tertiary-level hospital in Navi Mumbai.

Materials and methods: A retrospective study was done to determine the epidemiological and clinical profile of leprosy patients in a tertiary care center, MGM Medical College & Hospital, Navi Mumbai (September 2011 to August 2015). Data regarding demographic details, clinical features, investigations, treatment, and complications were analyzed.

Results: In total, 207 patients were registered over a 4-year period, with male:female ratio of 2.4:1 and children (≤ 14 years) constituting 7.2%. As per Ridley Jopling classification, borderline tuberculoid leprosy was the most frequent morphologic type, seen in 45.8%, followed by borderline lepromatous (28%), lepromatous leprosy (10.1%), and other forms in 11.5%. Multibacillary leprosy was the most common clinical type (81.1%). About 32.8% patients presented in reaction (type I in 22.7% and type II in 10.1%). World Health Organization (WHO) grade 2 deformities were diagnosed in 32.8%, with claw hand being the most common paralytic deformity (18.8%).

Conclusion: The study shows that despite statistical elimination, multibacillary disease, leprosy reactions, and deformities are commonly seen as presenting manifestations. Large population of migrant workers in Navi Mumbai could be a possible contributing factor towards these findings. It highlights the need to sustain and provide high-quality leprosy services to all patients through general health services, including good referral system. Investigations, such as slit skin smear and biopsy must be carried out for all newly diagnosed patients.

Keywords: Borderline tuberculoid leprosy, Grade 2 deformity, Leprosy epidemiology, Leprosy reactions, Multibacillary disease.

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INTRODUCTION

Leprosy has been a major public health problem in many developing countries for centuries. A major global share is from India. About 59% of the new leprosy cases detected globally in 2014–2015 were from India.1

As on April 1, 2015, 0.88 lakh cases were on record, giving a prevalence rate (PR) of 0.69 leprosy cases per 10,000 population as compared to a PR of 0.74 per 10,000 on April 1, 2008.2 During 2014–2015, 1.25 lakh new cases were detected, which makes the annual new case detection rate (ANCDR) of 9.73 per 100,000 population. This shows an ANCDR reduction of 16.84% from 11.70 during 2007–08. To understand public health requirements in the country and to enable efficient national program planning and management, it is important to understand epidemiological profile. Through this study, efforts have been made to highlight the current clinical profile and epidemiology of leprosy by evaluating patients visiting our tertiary-care center in Navi Mumbai.

MATERIALS AND METHODS

A retrospective data analysis of all leprosy cases registered at Department of Dermatology of MGM Medical College & Hospital, Navi Mumbai, from September 2011 to August 2015, was carried out. Ethical clearance was obtained from institutional ethical clearance committee. Our hospital is situated near Panvel, which is the southernmost part of Navi Mumbai, with patients coming from Raigad district as well as from the adjacent Thane district. Case detection was based on voluntary reporting, referrals from local general practitioners, and the surveys conducted in schools and general population by leprosy workers associated with our institute. The data were analyzed according to age, sex, residence, type of leprosy, leprosy reactions, and deformities. Patients were classified as per Ridley Jopling classification3 and as per the criteria laid down under the national leprosy eradication program (NLEP) and treated accordingly. In addition, as per the WHO classification,4 the disease was

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classified as multibacillary (MB) leprosy if there are six or more lesions, more than one nerve involvement and/or smear positive cases and as paucibacillary (PB) in other cases. At the end, data were compared with the national and global averages (Table 1).

RESULTS

A total of 207 new cases of leprosy were registered during the study period of 4 years (Table 2). The mean age of patients was 34.3 ± 15.9 years. Majority of the patients were in the young age group of 15 to 30 years (42%) (Fig. 1). Fifteen (7.2%) patients were children, and males outnumbered females with a ratio of 2.4:1.

Clinical Disease Spectrum Data Analysis

Multibacillary leprosy was the most common clinical type seen in 168/207 patients (81.1%). In total, 157 patients (75.7%) were in the borderline spectrum, that is, borderline tuberculoid (BT), mid-borderline (BB), and borderline lepromatous (BL). Borderline tuberculoid was the most frequent morphologic type, seen in 95 patients (45.8%) followed by BL in 58 (28%) and lepromatous leprosy (LL) in 21 (10.1%) patients. Additionally, other forms of leprosy were recorded in 24 (11.5%) patients including histoid, pure neuritic, and indeterminate forms in 4 (1.9%), 10 (4.8%), and 10 (4.8%) patients respectively (Fig. 2).

Clinically thickened peripheral nerve enlargement was recorded in 162/207 (78.2%) patients. Ulnar nerve was the most commonly thickened nerve seen in 60.8%, followed by common peroneal nerves in 40.5%, posterior tibial nerves in 31.8%, and radial cutaneous nerves in 30.4% patients. Only 29/95 BT patients (30.5%) had less than or equal to one nerve involvement. Biopsy records were available for 107/207 (51.6%) cases. Borderline tuberculoid leprosy was the most common histological diagnosis. Clinico-histopathological correlation was observed in 80 out of 107 cases (74.7%) with 27 cases (25.2%), demonstrating nonspecific histological features.

### Table 1: Comparison of NLEP indicators in the present study with national and global trends (2014–2015)

<table>
<thead>
<tr>
<th>Indicators (% of new cases detected)</th>
<th>Present study</th>
<th>NLEP (India) 2014–2015</th>
<th>WHO (Global) 2014–2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of childhood leprosy</td>
<td>07.24</td>
<td>09.04</td>
<td>08.8</td>
</tr>
<tr>
<td>Females</td>
<td>28.90</td>
<td>36.81</td>
<td>37.7</td>
</tr>
<tr>
<td>MB</td>
<td>81.15</td>
<td>52.82</td>
<td>60.6</td>
</tr>
<tr>
<td>Grade 2 disability</td>
<td>32.85</td>
<td>04.61</td>
<td>6.6</td>
</tr>
</tbody>
</table>

### Table 2: Yearwise distribution of newly registered leprosy patients

<table>
<thead>
<tr>
<th>Year</th>
<th>Total patients registered</th>
<th>MB cases</th>
<th>Type 1 reaction</th>
<th>Type 2 reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>2011–2012</td>
<td>62</td>
<td>48</td>
<td>77.4</td>
<td>19</td>
</tr>
<tr>
<td>2012–2013</td>
<td>53</td>
<td>44</td>
<td>83.0</td>
<td>12</td>
</tr>
<tr>
<td>2013–2014</td>
<td>48</td>
<td>41</td>
<td>85.4</td>
<td>8</td>
</tr>
<tr>
<td>2014–2015</td>
<td>44</td>
<td>35</td>
<td>79.5</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>207</td>
<td>168</td>
<td>81.1</td>
<td>47</td>
</tr>
</tbody>
</table>

**Fig. 1:** Agewise distribution of newly registered leprosy patients

**Fig. 2:** Clinical presentation of newly registered leprosy patients
Reactions and Deformities

At first visit, 32.8% of the patients were seen to be in reaction. Type 1 lepra reaction (T1R) was present in 47 patients (22.7%) and type 2 lepra reaction (T2R) in 21 (10.1%) (Table 2). Among T1R, 51% of the cases were observed among BT patients, while most of the T2R (80.9%) was seen in lepromatous patients (BL and LL). Neuritis was seen in 33 patients (15.9%), of whom 12 had T1R and 4 had T2R. Ulnar nerve was the most commonly affected nerve (n = 19/33). Deformities (WHO grade II) of the hands, feet, or eyes was seen in 68/207 patients (32.8%) at the time of diagnosis. Among these, claw hand was the most common paralytic deformity seen in 39 (18.8%), followed by trophic ulcer in 35 (16.9%) and foot drop in 5 (2.4%) patients (Figs 3 to 6).
DISCUSSION

As standardized by the WHO, multidrug therapy (MDT) is very effective and a powerful tool in treatment of leprosy, especially when patients report early and start prompt therapy. However, poor adherence has detrimental consequences, including incomplete cure, persisting infectious sources, transmission to new susceptible person, and multidrug resistance, and also risk of developing disability or deformity. Early detection depends almost completely on voluntary reporting, which implies awareness of the disease and its treatment facilities. Our data from a tertiary care referral center show that an early active search for cases is required.

Multidrug therapy has brought down the prevalence of disease in India from 25.9 in 1991 to 0.69 per 10,000 populations in March 2015. However, as seen in the present data, the scenario is far from satisfactory. The number of new cases as detected by 121 countries globally during 2015 was 213,899, among which, India contributed 59% (125,785 cases). Leprosy cases are not uniformly distributed in a country, but tend to cluster in certain areas, villages, or talukas. Prevalence rate of Maharashtra state is 0.95 per 10,000 populations, which is higher than the national PR of 0.69. Mumbai represents 1.51% of the population of India, as per the 2011 census, with a sex ratio of 853 females per 1000 males. Mumbai achieved elimination of leprosy in 2008–2009. However, rapid industrialization and increasing density of migrant population in slums is creating many challenges for health services management. Since the disease was declared eliminated, resources were taken from the control of leprosy and given to other areas, such as HIV and tuberculosis. The problem is, there are pockets in India where leprosy is still rife, and therefore we see a probable resurgence of the disease in recent years.

In this study, the total number of new cases was 62 in 2012 and decreased to 44 in 2015, suggesting decline in disease burden (Table 2). Most of the patients belonged to the young age group (15 to 30 years), similar to the finding reported by Jindal et al. The percentage of childhood leprosy was 7.24%, which is marginally lower than 9.6% as reported by Singal et al and almost similar to that of Grover et al, who reported 7.06% from a tertiary hospital located in central Delhi. This indicates that leprosy continues to be transmitted in the community.

The higher male-to-female ratio (2.4:1) in our study could be due to increased number of males migrating to cities in search of employment and lack of social perception toward female health care. Such findings on disease prevalence have been reported by other authors as well.

The percentage of MB cases (81.1%) in our study was significantly higher than PB cases. A retrospective study of 16 years from a tertiary hospital in Delhi also showed 80.5% MB cases. This is a strong indication of the fact that even today, there are inaccessible pockets of population harboring undiagnosed leprosy patients for a long time. Moreover, being a tertiary hospital in the periphery of Mumbai, we were referred patients with more severe spectrum of diseases, whereas others were effectively managed at primary or secondary health care centers.

The most frequent morphologic type was BT (45.8%), which is less than the observations made by Tiwary et al (56.9%), Mahajan et al, and Singh et al. However, a high proportion of these BT patients were found to have MB disease (76.8% cases, n = 73/95) on investigation through slit skin smear (SSS) and biopsy. It has also been reported that among patients initially diagnosed as PB clinically, up to 38 to 51% turn out to have MB disease and, hence, are at risk of undertreatment. Therefore, SSS should be done in all patients and if possible biopsy. This will not only confirm the diagnosis, but will also ensure accurate identification of the spectrum and features of MB involvement as early as possible for proper treatment.

The clinicohistopathological concordance of 74.7% was found in patients, which is higher than 60.6% reported by Kumar et al and marginally lower than 78.8% reported by Chhabra et al. About 32.8% presented with reactions; among which, 22.7% had T1R, which was
lower than that reported by Kumar et al (30.9%).17 Most of T1R was seen in BT leprosy (51%). T2R was seen in 10.1% patients (most of whom (80.9%) belong to lepromatous spectrum), which is slightly higher than that reported by Chhabra et al (7.1%).18 Furthermore, proportion of WHO grade 2 deformities at presentation (32.8%) was much higher than that reported by Jindal et al (17.8%).8 These data suggest that the patients present to health care facilities when much damage has already occurred.

Limitations

The findings in this study are subject to at least two limitations. First, study was done by retrospective data analysis based on departmental records and data were limited to only those patients who reported to us, either voluntarily or on being referred. Second, being a tertiary care referral center and medical college, more patients belonging to severe spectrum of leprosy were registered, whereas other patients were managed by either primary or secondary health care center. Community-based surveys covering the district population could be more informative and exhaustive.

CONCLUSION

Although great progress has been made in elimination of leprosy, lot of work still needs to be done. We may have won the battle, but the war is still on. The high rate of MB disease (81.15%) and patients presenting with reactions and deformities (32.85%) at our tertiary referral center as compared to the national averages (52.82 and 4.61% respectively) is a big concern.

The task ahead remains difficult, with a need for strong epidemiological monitoring at all levels. As the last mile is always the hardest to go, intensified focus should be made on early case identification, prompt and complete cure, and a strengthened referral mechanism to deal with the complications and sequelae of the disease. Else the progress, we have achieved so far due to the hard work of health personnel may go waste, just at a time when success is so close.

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