

Leprosy Profiles In Post Elimination Stage: Experience At A Tertiary Care Hospital**Mousumi Kilikdar*, Dilip Gedam**, Ashwini Pisey***, Nitin Ambhore****, Rajesh Karykarte*******

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Abstract: Background: Leprosy is a chronic granulomatous disease caused by Mycobacterium leprae mainly affecting skin, peripheral nerves. Leprosy has been statistically eliminated from India since 2006, still wide variations in prevalence rates continue to exist across the states and union territories in the country. Objectives: The present study was conducted to determine the pattern, prevalence and trends of smear positive leprosy cases in a tertiary care hospital in Akola, Maharashtra. Methods: This is a retrospective record based study conducted over a period of 25 months commencing from January 2016 to February 2018. All the patients suspected of leprosy were referred to the Department of Microbiology, GMC Akola, where cases were confirmed by slit skin smear examination. From OPD records details on age, type and duration of disease, deformity status were noted. Results: Of total 502 clinically suspected cases 174 were diagnosed as smear positive for acid fast bacilli in which males outnumbered the females. Smear positivity was highest in age group 21-40 years. Multibacillary and paucibacillary cases were 102(58.62%) and 72(41.37%) respectively. 67(38.50%) cases developed grade II deformities. Reactional episodes with or without neuritis occurred in 84 patients (48.27%) of which 56 (32.18%) developed Type 1 reaction and 28 (16.09%) developed Type II reaction with lesions of erythema nodosumleprosum (ENL). Interpretation & Conclusion: The study shows that despite statistical elimination, leprosy still continues to be a challenge to health worldwide. Approaches like destigmatizing the disease, family counselling, integrating leprosy care into general health care systems, developing newer diagnostic & epidemiologic tools, chemoprophylactic regimens and vaccines are needed to develop an eradication strategy which can reduce the burden of leprosy in India. [M Kilikdar, Natl J Integr Res Med, 2018; 9(2):64-67]

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Introduction: From antiquity to modernity Leprosy still continues to be a challenge to health worldwide. It is a chronic granulomatous disease caused by Mycobacterium leprae affecting skin, eye, nasal mucosa, testis, kidney, both somatic and autonomic nerves. Neuropathy can result in complications like deformity and disability. Mycobacterium leprae is a Gram positive, acid fast bacilli, aerobic and thermolabile, varying in size from 6-8 µm x 0.5 µm. It is characterized by a very long incubation period, 5-7 years and generation time being 12-14 days.

Based on clinical manifestations, leprosy is classified as tuberculoid leprosy, lepromatous leprosy, indeterminate leprosy, borderline tuberculoid and borderline lepromatous leprosy¹. According to WHO, leprosy is divided into two groups paucibacillary and multibacillary². Lepra bacilli can be demonstrated in smears as acid fast bacilli present singly or in globi³. Demonstration of acid fast lepra bacilli in stained smears is an approach to confirm the diagnosis, monitor the progress of disease, outcome of treatment and also for calculating bacteriological and morphological indices³.

Although India achieved statistical elimination from leprosy in 2006, a large proportion of leprosy cases reported globally consisted of India. The national prevalence being 0.66/ 10,000 population, the prevalence in Maharashtra is more than 2/10,000 population in March 2016⁴. Since transmission of leprosy is from man to man, the only way to achieve elimination is early diagnosis and treatment³.

The present study was conducted to determine the pattern, prevalence and trends of smear positive leprosy cases in a tertiary care hospital from January 2016 to February 2018.

Methods: The Department of Microbiology, Government medical college Akola is a tertiary care hospital providing laboratory confirmation of leprosy by slit skin smear examination. This retrospective record based study was conducted over a period of 25 months commencing from January 2016 to February 2018. All the patients suspected of leprosy, visiting or referred to this hospital were included in this study irrespective of their age & sex. Smears were prepared from 4 sites: one from each ear lobe and two from sites of lesion/ active disease. Slit and scrape method

was used for collecting materials from ear lobes. The smears were stained with modified Ziehl- Neelsen stain and examined under oil immersion to look for both intra and extracellular acid fast bacilli and reported accordingly. Bacteriological indices were calculated. From OPD records details on age, type and duration of disease, deformity status were noted.

Bacteriological index (BI): Density of lepra bacilli in smears including both solid and fragmented forms, BI is obtained by adding up the index from each site examined and dividing by the total by number of sites examined.

According to Ridley's Logarithmic Scale, Ranges of BI are:

- 1+: 1-10 bacilli/100 fields.
- 2+: 1-10 bacilli/10 fields.
- 3+: 1-10 bacilli/one field.
- 4+: 10-100 bacilli/one field.
- 5+: 100-1000 bacilli/one field.
- 6+: > 1000 bacilli/one field.

Results: A total of 502 clinically suspected patients were examined. Males outnumbered the females and the male: female ratio was 1.98:1. 174 patients were diagnosed as smear positive for acid fast bacilli in which male: female ratio was 2.22:1 (Table 1).

Age wise analysis of data reveals that majority of patients belonged to the age group 21-40 years .The number of smear positive cases also being highest in the same age group (Table 2).

Analysis of bacteriological indices among smear positive cases shows that majority of smear positive cases had BI of 2 + (46%). Smear positive cases with globi (BI 6+) are 11% (Table 3).

Year-wise analysis of data reveals a decline in number of smear positive cases from 42.72% to 28.36% (Table 4).

Multibacillary cases outnumbered paucibacillary cases (Table 5) and 67 cases (38.50%) developed deformities of hands, feet (WHO Grade II disability). Reactional episodes with or without neuritis occurred in 84 patients (48.27%) of which 56 (32.18%) developed Type 1 reaction and 28 (16.09%) developed Type II reaction with lesions of erythema nodosumleprosum (ENL).

Table 1: Sex distribution of smear positive leprosy cases

Gender	Total cases	Smear –positive cases
Male	334	120
Female	168	54
Total	502	174

Table 2: Age wise distribution of smear positive leprosy cases

Age group	Number of cases	Smear positive cases
0-20	97	0
21-40	205	100
41-60	175	55
61-80	25	19

Table 3: Analysis of BI among smear positive leprosy cases

BI	Males	Females	Total	Percentage (%)
1+	20	2	22	12.64%
2+	45	35	80	45.97%
3+	20	6	26	14.94%
4+	20	6	26	14.94%
5+	0	0	0	0
6+	15	5	20	11.49%

Table 4: Year wise analysis of smear positive leprosy cases

Year	Number of patients examined	Number of Smear positive patients	Percentage of Smear positive patients
January 2016 To January 2017	220	94	42.72%
February 2017 To February 2018	282	80	28.36%
Total	502	174	34.66%

Table 5: Distribution of cases as per type of the disease

Type of leprosy	Total	Percentage (%)
Paucibacillary	72	41.37%
Multibacillary	102	58.62%

Discussion: In our study, male preponderance was seen which is in concordance with trends prevalent in our country where males frequently self report for

treatment and females are slow to self report⁵. Increased mobility and frequent interaction with community also leads to increased opportunity for contacts in males⁶. This is similar to findings reported by Seher et al and Singh et al^{7,8}. Majority of patients belonged to age group 21-40 years, which correlates with findings reported by Jindal et al & Mathan et al^{9,10}. The bacteriological indices of smear positive patients ranged from 1+ to 4+ with majority of patients (45.97%) having BI of 2+ indicating low bacillary load and good prognosis on treatment. But patients with BI 6+ (11.49%) having high bacillary load & disabilities are highly infectious and are more likely to transmit the disease in the community. A significant observation in this study period is declining smear positivity from 42.72% to 28.36% which may be the result of continuation of MDT and timely completion of treatment of large number of cases. In our study majority of cases (58.62%) belonged to multibacillary type which is correlating with other studies like Arora et al and Pandey et al^{11,12}. Other studies like Rao et al and Mahajan et al^{13,14} reported paucibacillary as the most common type among the leprosy cases. In our study 38.50% cases developed grade II deformity which is higher than the disability rates reported in studies like Jayakumar et al (22-27%), Norman et al (20-25%)^{15,16}. This higher disability rate could be due to social stigma, late reporting to the hospital and delay in starting the treatment. In this study reactional episodes are seen in 48.27% cases which is consistent with other studies like Arora et al and Kumar et al^{11,17}. Increasing incidence of reactions over years perhaps shows increasing awareness in patients for reactions which compels them to seek treatment from a hospital rather than field based clinics. We observed that the occurrence of neuritis significantly increases the risk of deformities especially in multibacillary cases. The hallmark of leprosy is the unique ability of *M. leprae* to survive within the Schwann cells of peripheral nerves. Hence the infected nerves and surrounding tissues can be damaged as the host mounts an immune response to bacterial antigens¹⁸. Factors triggering these immune responses are not fully understood but if not treated properly can lead to permanent sensory, motor and or autonomic peripheral nerve damage which may result in severe disability¹⁸. So rehabilitative measures such as physiotherapy and corrective surgeries should be offered to those patients.

Bacteriological examination is an essential screening procedure for all suspected cases of leprosy and also considered to be important for confirmation of diagnosis, classification & management of leprosy¹⁹. Though the specificity of slit-skin smear is almost 100% but sensitivity ranges from 10% - 50%¹⁹.

Directorate General of Health Services, Central Leprosy Division, New Delhi has issued guidelines on strengthening of skin smear labs for leprosy control programs. However, to ensure reliability and uniformity continuous monitoring and supervision for the collection & processing of slit-skin smears are necessary. Although India has announced statistical elimination of leprosy but such a strategy can not be justified at the moment as new case detection rate not abating significantly. Approaches like destigmatizing the disease, family counselling, integrating leprosy care into general health care systems, developing newer diagnostic & epidemiologic tools, chemoprophylactic regimens and vaccines are needed to develop an eradication strategy which can reduce the burden of leprosy in India.

Conclusion: The study shows that despite statistical elimination, leprosy still continues to be a challenge to health worldwide. There is an urgent need for early diagnosis, treatment and prevention of disability, strengthened eradication strategy which can reduce the burden of leprosy in India. The limitation of the study was being a retrospective study based on departmental records, bias in reporting could not be ruled out and community based surveys covering the district population could not be done.

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