

# Incidence and Clinical Profile of Leprosy in a Tertiary Care Hospital in Hyderabad, Telangana

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## ABSTRACT

**Introduction:** Leprosy an infectious disease still remains a major public health hazard. Though it has been eliminated from the world and from India, it has not been completely eradicated. New cases continue to occur indicating an active transmission of the disease from person to person. Therefore this present study was conducted to ascertain the incidence and clinical profile of leprosy cases at a tertiary care center in Hyderabad, Telangana. This study further proposed various strategies to help reduce incidence rates, as this disease, for the most part, is acquired by contact with the infected persons.

**Material and methods:** This retrospective study collected data on the occurrence of incidence cases by reviewing health records in our hospital setting. Clinical records of the patients provided useful information on the demographic profile, type of leprosy, details of clinical examination, and treatment protocol followed to help assess the incidence and clinical profile of the leprosy cases. Slit skin smear examination for acid-fast bacilli helped to confirm clinically suspected cases of leprosy.

**Results:** From a total of 97 clinically assumed cases reporting to our hospital 24 were found to be positive for acid-fast bacilli. These cases were neither previously diagnosed as leprosy nor had undergone any treatment for leprosy. The majority of the diagnosed cases belonged to the middle age group (50%). 75% of incidence cases were males. Borderline tuberculoid (33%) was the most frequent type of leprosy observed in this study.

**Conclusion:** This study concluded that although the prevalence rate has decreased over a period of time, incidence cases still do occur indicating an active transmission of the disease from the infected persons to the contacts. This study further addressed various strategies which could help decrease these incidence cases.

**Keywords:** Incidence and Clinical Profile, Leprosy

## INTRODUCTION

Leprosy or Hansen's disease is a chronic granulomatous and infectious disease primarily affecting the skin and peripheral nerves. Mycobacterium leprae is the causative agent, transmitted primarily by droplet spread from person to person. Though being one of the first infectious diseases to have its etiologic agent discovered, it remains a disease of public health concern because of the new cases occurring each year.<sup>1</sup> It was eliminated as a public health problem from India in December 2005 with a prevalence rate less than 1/10,000 populations.<sup>2</sup> Nevertheless, new cases still do occur in India with a total of 1.35 lakh new cases detected during the year January 2016 to December 2017, accounting to Annual New Case Detection rate of 10.17/1,00,000 population.<sup>3</sup>

According to the data on global leprosy figures, India accounts for the highest leprosy burden, contributing more than 60% of the new cases of leprosy globally.<sup>4</sup> Although the disease is present throughout the country, the distribution is not uniform. Certain states show a low prevalence and incidence rate in comparison to the others. Addressing the clinical aspects of the disease it mainly causes damages to the skin, the peripheral nerves, mucosal surfaces of the upper respiratory tract and the eyes resulting in impairment of nerve function and disabilities. The early form of disabilities manifest in the form of sensory loss of hands or feet often goes unobserved by both the clinicians and the patients furthering the transmission of *M. leprae*.<sup>5</sup>

The earliest effective treatment against leprosy started with the introduction of dapsone in the late 1930s. Nonetheless, in the 1960s dapsone-resistant strains of *M. leprae* appeared.<sup>6</sup> To combat this drug resistance, the World Health Organization recommended multidrug treatment (MDT) consisting of dapsone, rifampicin, and clofazimine in 1981.<sup>7</sup> This therapy was found to efficiently heal the patient of the disease process and reduce the infectivity rate through droplet spread from the infected person to a susceptible individual.<sup>8</sup> In the initial years, 3 years of MDT, a 45% decrease in the global leprosy prevalence was observed. Regardless of the 30 years of effective MDT, the incidence of leprosy has nearly remained unchanged since 2005.<sup>7</sup>

Hence the present study was conducted to determine the incidence and clinical profile of newly diagnosed leprosy cases at a tertiary care center in Hyderabad, Telangana and

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recommended strategies to reduce these incidence cases, as this disease, for the most part, is acquired by contact with the infected person.

## MATERIAL AND METHODS

Telangana, situated on the center-south stretch of the Indian peninsula, is the country's 12<sup>th</sup> largest and most populated state with 37,591,317 residents as per the 2017 census. According to the NLEP annual report 2016-2017, 2,658 new cases were detected in this state accounting for an annual new case detection rate of 7.07 per 1,00,000 population.<sup>3</sup>

This retrospective descriptive study to determine the incidence of leprosy involving reviewing of the medical records from January 2016 to December 2017 was conducted at Shadan Institute of Medical Sciences, a tertiary care hospital, located about 16 km's from the Hyderabad Railway Station, Telangana. Our Hospital serves the medical needs of all nearby villages like Bandlaguda Kismathpur, Peerancheru, Rajendra Nagar, Moinabad, Golconda Fort, Ibrahim Bagh, Narsingi, and Gandipet etc.

Institutional ethical clearance was obtained prior to anonymising the data. Clinical records of patients provided information on demographic data, type of leprosy, details of clinical examination, and the treatment protocols. Slit skin smear examination for acid-fast bacilli, a valuable and cost-effective tool was routinely used in the hospital setting for all the clinically suspected cases to confirm the diagnosis of leprosy. It was performed on a sample of skin smear to measure the level of leprosy indicators in the skin smear.

These smears were then stained with modified Zeihl-Neelsen stain and examined under oil immersion to look for acid-fast bacilli (AFB) both intra and extra-cellular and reported as positive or negative for AFB. Demonstration of AFB by slit skin smear is still considered important for diagnosis, management, and classification of leprosy.<sup>9,10</sup> Although biopsies give a better demonstration of AFB, it is an invasive method without any definitive role in the management of leprosy.<sup>11,12,13</sup> Henceforth we used the slit skin smear method for routine management of all cases of leprosy

Patients were classified according to Ridley Jopling classification as multibacillary or paucibacillary type. This categorization as per the World Health Organization (WHO) guidelines for performed for the purpose of multi-drug treatment.<sup>14</sup>

There are six different types of leprosy based on the severity of symptoms i.e. intermediate leprosy, tuberculoid leprosy, borderline tuberculoid leprosy, mid-borderline leprosy, borderline lepromatous leprosy, and lepromatous leprosy. Clinical history, lepromin skin test, and biopsy helped determine the particular type of leprosy in the present study. The lepromin skin test is used to determine the type of leprosy the person has contracted. This test is also known as the leprosy skin test. This test is performed by injecting a sample of inactivated *M. leprae* under the skin. Specific reactions at the injection site examined 3 days after the injection indicate the type of leprosy. Further a skin biopsy of a small section of the skin confirmed the nerve involvement and the type of

leprosy.

## STATISTICAL ANALYSIS

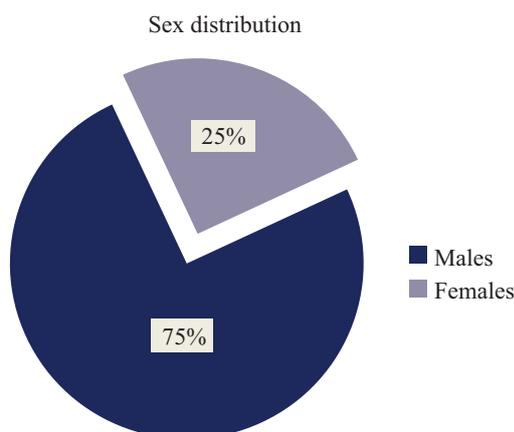
Though data were collected routinely through the patient's treatment cards, only consolidated information was entered in a Microsoft Excel database every month. Descriptive statistics were used to present the findings of the study in terms of percentages.

## RESULTS

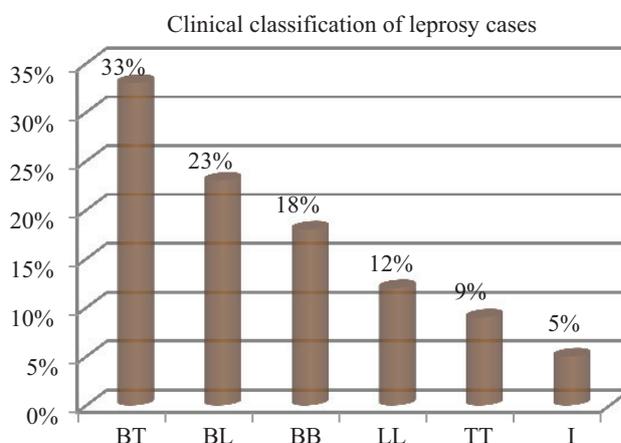
A total of 97 clinically suspected leprosy cases reported to our hospital from January 2016 to December 2017, out



**Graph-1:** Illustrates the age distribution of the leprosy cases

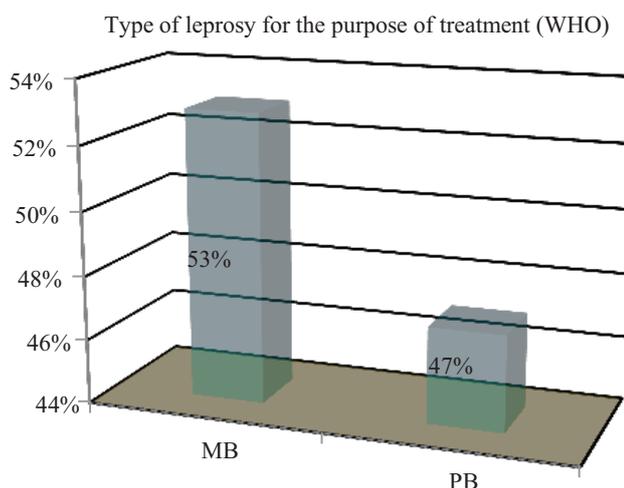


**Graph-2:** Illustrates the sex distribution of the leprosy cases



BT: Borderline Tuberculoid, BL: Borderline Lepromatous, BB: Borderline-borderline, LL: Lepromatous leprosy, TT: Tuberculoid, I: Indeterminate

**Graph-3:** Illustrates the clinical classification of leprosy cases



**Graph-4:** Illustrates the WHO classification of leprosy for the rationale of treatment

of which 24 were positive for acid-fast bacilli. This AFB diagnosed leprosy cases had no prior history of treatment for leprosy. This data was analyzed according to age, sex, type of leprosy and as per the World Health Organization classification of multibacillary and paucibacillary types.

As a result of retrospective analysis on different age groups, maximum numbers of leprosy cases were found between 20-40 years (50%) (Graph1). Next age groups who are more prone to attack with the disease were the people with above 40 years with 33.3%. The least percentage with 16.6% of the population could be developing the disease were with less than 20 years of age group. Youngest and oldest patient cases recorded were aged 18 years and 65 years respectively (figure-1).

A male (75%) preponderance of leprosy cases was observed in the present study in comparison to the males (25%) (Figure-2).

The retrospective data in our hospital was observed with all the different cases of leprosy with the variations in the percentages which was depicted in the graph 3. Among all the classes of leprosy three different borderline leprosy cases i.e. BT with 33%, BL with 23% and BB with 18% were observed to be dominant. Next highest recorded cases were Lepromatous leprosy with 12%, followed by tuberculoid (9%), and the least being the indeterminate leprosy (5%) (figure-3).

As per the World Health Organization classification of leprosy, we analyzed and segregated the data to observe the previously recorded cases in the year January 2016 to December 2017 in Shadan Medical College and Hospital. It was observed that the multibacillary (MB) leprosy cases accounted for 53% being the highest number against 47% of cases with paucibacillary disease (figure-4).

## DISCUSSION

The most recent global leprosy update, 2016 stated that although a significant reduction in the prevalence of the disease occurred worldwide since the mid-1980s to elimination levels, new cases continue to arise indicating

continued transmission. India accounts for 60% of new cases reported worldwide and are among the 22 “global priority countries” contributing 95% of the world numbers of leprosy necessitating a continued effort to bring down the incidence cases.<sup>15</sup> Henceforth, we conducted a retrospective study by reviewing medical records in our hospital setting to determine the incidence and clinical profile of newly diagnosed leprosy cases.

The diagnosis of leprosy is primarily clinical. Patrick Manson described the earliest method of diagnosis by squeezing the nodule and examining the obtained exudates microscopically. A number of procedures including the puncture technique, skin clip method, Water and Rees viability index and scale to measure the bacterial density were proposed over a period of time to confirm the diagnosis of leprosy.<sup>16</sup> In the present study, we used a slit skin smear examination for AFB as it possesses nearly 100% specificity and remain the simplest diagnostic technique currently available.<sup>17</sup>

We stratified the collected data according to age, sex, type of leprosy and as per the World Health Organization therapeutic classification of multibacillary and paucibacillary types. Majority of leprosy cases in our present study belongs to the age group of 20-40 years (middle age) similar to the finding in other studies.<sup>18,19,20</sup> The reason for the disease being more common in this age group indicates susceptibility because of increased mobility and opportunity for contacts in the larger segment of the population.

A male preponderance was seen in our study with a male to female ratio of 3:1. Male preponderance in our study group is in concordance with other studies on leprosy as well.<sup>21,22</sup> This male predominance can be attributed to more of outdoor activities in search of livelihood leading to a higher chance of them contracting the infection and better opportunities for health care.

Borderline leprosy cases dominated the clinical picture (BT; 33%, BL; 23%, BB; 18%) followed by Lepromatous leprosy (12%), tuberculoid (9%), and indeterminate leprosy (5%). Among borderline leprosy the most frequently observed clinical type was borderline tuberculoid which is similar to observations by Tiwary et al.<sup>23</sup> The precise treatment for Hansen's disease is the multi-drug therapy by the WHO. It is administered in accordance with the operational classification of the patient as either Paucibacillary or Multibacillary. This categorization is paucibacillary (PB) for cases with 5 skin lesions or less or multibacillary (MB) in the case of more than 5 lesions.<sup>24,25</sup> Therefore once diagnosed, a leprosy patient ought to be classified for therapeutic reasons.

Majority of the new leprosy cases in our study had multibacillary leprosy (53%), as opposed to 47% paucibacillary cases (PB). Patients with these multibacillary forms of the disease are considered the major source of infection.<sup>26</sup> MB predominance has also been reported in other studies.<sup>27,28</sup> Increased percentage of MB cases indicates the occurrence of advanced cases of Leprosy, and indirectly the extent of infection, in the nearby communities surrounding the hospital.

In spite of all the initiatives taken by the National leprosy

eradication programme (NLEP), a decline in the occurrence of new leprosy cases in India has not occurred over the last decade. Therefore we are presenting a brief overview of some of the initiatives or control strategies which can help decrease these incidence cases in the future i.e. annual new case detection rate.

### Recommendations

Drugs to combat leprosy were introduced by the WHO in the year 1982. It is seen that till date, three standardized drugs constitute multi-drug therapy for leprosy, and with emerging resistance to this class of drugs, there is a need to expand the range of drugs to treat leprosy. Clinical and laboratory studies imply the emergence of drug resistance in patients treated with dapsone and rifampicin.<sup>29,30</sup> This drug resistance can lead to potential carriers further transmitting the infection from person to person thereby increasing incidence cases of leprosy. The suggested alternative drugs like ofloxacin, minocycline, clarithromycin, rifapentine, and moxifloxacin are known to be effective in the treatment of leprosy.<sup>31,32</sup> Nevertheless, there are no approved protocols to use them, except for cases of proven resistance to rifampicin. Therefore, appropriate research studies in this direction can pave a way to improved drug therapy for this disease indirectly contributing to a decrease in the incidence of leprosy.

Relapses caused by inadequate treatment or irregular treatment are another major problem reported globally with respect to leprosy.<sup>33</sup> Patients who receive no or inadequate treatment constitute a source of contagion.<sup>34</sup> Therefore monitoring these relapse cases in relation to treatment completion can help prevent the spread of infection and henceforth accounting to reduced incidence rate.

The possibility of acquiring leprosy for individuals within the family is 5-10 times higher for multibacillary patients, and 2-3 times higher with paucibacillary patients than for people not living in such households.<sup>35</sup> These undiagnosed cases and subclinical infections in contacts contribute a considerable proportion of all new leprosy cases. Case detection campaigns and contact tracing programme would unquestionably reduce this disease burden.

### CONCLUSION

Our study showed the current status of leprosy in a tertiary care hospital. Although leprosy is eliminated from India, new cases are still being reported necessitating the need for appropriate control strategies and initiatives to decrease this incidence. Surveillance, early diagnosis, and complete treatment can help eradicate this disease in the near future.

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