

# Leprosy in a tertiary care hospital, Bagalkot, India: Clinical study and a reappraisal in the post-elimination era.

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## Abstract

**Background:** Leprosy is a chronic infectious disease caused by *Mycobacterium Leprae*. The disease mainly affects the skin, and peripheral nerves. The prevalence far exceeds the elimination level in many states and union territories.

**Objectives:** 1. To assess the profile of newly detected cases of leprosy.

2. To describe the histopathological profile and complications associated with the cases.

**Settings and design:** This was a Prospective study.

**Materials and methods:** The study was carried out for 12 months and it included 45 new cases.

**Results:** A total of 45 cases were registered during this period, 34 of them being males. Maximum number of cases belonged to the age group of 20-39 years (46.66%) and 40-59 years (26.67%). 7(15.55%) cases were between 10-12 years of age. Borderline Tuberculoid (BT) was the commonest clinical type in 21(46.66%) patients. Mid borderline (BB) was seen in 3 (6.66%), borderline lepromatous (BL) in 1(2.22%) case, Lepromatous leprosy (LL) in 10 (22.22%), tuberculoid leprosy in 5 (11.11%) cases and pure neural leprosy (PNL) in 3(6.66%) patients, whereas diagnosis of indeterminate leprosy was made in 2(4.44%) cases. Out of all the 45 cases, 4(8.88%) patients showed features suggestive of a lepra reaction, 2(2.22%) of them being type 1 and 2(2.22%) showed features of type 2 reaction. 4(8.88%) patients showed symptoms of neuritis. Slit skin smear (SSS) was done in all patients, out of which, 11(24.4%) patients showed presence of Acid fast bacilli [AFB] and 3(6.66%) patients showed Bacillary Index [BI] of 6+.

**Conclusion:** Despite the statistical elimination of leprosy in this region, new cases continue to present in alarming number.

**Key words:** Leprosy, Acid fast bacilli, Hansens disease.

## Introduction

Leprosy has afflicted humanity since time immemorial. There are many countries in Asia, Africa and Latin-America with a large number of leprosy cases. It still remains an important cause of disability years after WHO adopted the resolution to “eliminate leprosy as a public health problem by the year 2000” way back in 1991<sup>[1,2]</sup>.

WHO declared leprosy elimination (reported prevalence less than one case per 10,000 population) from most of the countries where it was considered

a major public health problem in 1985<sup>[3]</sup>. However, pockets of high endemicity still persists in some regions of our country.

Although India achieved elimination from leprosy in 2006 a large proportion of leprosy cases reported globally constitute from India. Having a national prevalence of 0.72 per 10,000 during march 2009 with only three states/union territories[UT] lagging behind the elimination target<sup>[4]</sup>. Even in states and Union Territories that have achieved elimination a few districts and blocks continue to have a

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prevalence of >1/10,000. Special plans such as Focussed Leprosy Elimination Plan (FLEP) have been launched under National Leprosy Eradication Programme (NLEP) to bring down the prevalence in these high endemic areas of our country<sup>[5]</sup>.

In many countries the proportion of Multi Bacillary[MB]leprosy cases among new cases remains still high like for example democratic republic of Congo(72%), Indonesia(81%), Cuba 83(%) andKenya (99%).Not only the indicator of active transmission, that is proportion of children among new cases remains high(>20%) in countries like Liberia, Domenican republic, Indonesia, but also shows increase in Nepal andSudanupto 5% in thepast fewyears and continues to remain high in India<sup>[6]</sup>.

In 2011, of the total 219,075 new leprosy cases reported globally, 58.1%were detected only in India<sup>[7]</sup>. According to WHO weekly epidemiological report 2013 the southeast Asian region accounts for71% of new cases detectedworldwide. Out of the global total 2,32,857 new patients 1,34,752 have been detected in India in 2012<sup>[8]</sup>.

It was the availability of effective multidrug treatment that led to the thought of leprosy elimination despite little understanding of its epidemiology. However the combination of biological and epidemiological evidence suggests that leprosy cannot be eliminated by Multi Drug Therapy [MDT] alone as the microbiology of leprosy is fully not elucidated. Therefore leprosy should be grouped under chronic stable diseases that are successfully controlled.

This study was carried out to study the clinical profile of new cases of leprosy in a tertiary care hospital, S. Nijalingappa Medical College , Bagalkot, Karnataka.

## Materials and methods

The present study was conducted in the department of Dermatology in a medical college in northern Karnataka. It was a prospective study. Clinically suspected leprosy cases attending the Dermatology Outpatient department/In-patient department(IPD) at S.N. Medical college and research centre, Bagalkot between April 2013 and March 2014 were included in the study.45 newly diagnosed cases of leprosy were detected during this period. Informed consent was taken from all the patients. Patients who did not give consent were excluded from the study.

This tertiary care centre and teaching hospital caters to a large population of northern districts of Karnataka including the native population as well as migrants from adjoining states and other parts of India. Cases were detected by voluntary reporting to the hospital rather than active case finding or surveys.

After obtaining informed consent, brief history regarding the onset of symptoms and previous treatment taken if any, were obtained followed by a thorough clinical examination of all cases. After a thorough cutaneous and neural assessment, routine haematological investigations such as complete blood counts, blood sugar and ESR were done followed by SSS for AFB and histopathology if required.

Individual case were taken up if one or more of the three cardinal signs (hypopigmented or erythematous skin lesions with definite loss or impairment of sensation, definite thickening of peripheral nerve with sensory impairment and skin smear positive for acid fast bacilli(AFB) were present. Follow up cases were not included in the study.

Age, sex, duration of symptoms, possible source of contact and clinical findings were documented in each patient. Detailed history of any 'Household / intrafamilial contact' or 'extra familial contact', number and distribution of lesions, pattern of nerve involvement and complications including lepra reactions, neuritis, and deformities were documented.

Clinical details included number and distribution of lesions, pattern of nerve involvement, and complications including lepra reactions and neuritis. The slit skin smear examination(SSS) results and histopathological features on skin biopsy were also evaluated. The smears were prepared from three sites- eyebrow, ear lobule, and a characteristic skin lesion to demonstrate AFB. The bacillary index(BI) was calculated as the mean of separate BI's from three sites and ranged from 0-6+. Patients were further classified into multibacillary(MB) or paucibacillary (PB) patients, using the WHO classification based on number of lesion and skin smear positivity for AFB.

After deciding the clinical spectrum of patients through detailed history, physical examination,

slit skin smear and histopathological examination, patients were treated with paucibacillary and/or multibacillary therapy depending upon the disease spectrum. Majority 24(53.33%) of our patients were started on MDT-PB treatment, MDT-MB was given in 11(24.44%) patients. Management of deformities was done according to grade and type of deformity. Type 1 deformities of hands and feet were managed by giving proper education and demonstration about how home care can be done. Type 2 deformities were managed according to the disability present. Proper wound care and dressing of ulcers if present was done.

### Satellite lesion



### Results

A total of 45 cases attended the centre during the one year period. The patients were from the neighbouring districts and adjoining states.

**Age and sex distribution:** Among the 45 patients who attended the clinic, there were 34(75.55%) males and 11(24.44%) females. Males out-numbered females with a ratio 3:1.

Majority (21) of the patients were in the age group of 20-40 years as shown in table 1. Family history of Hansen's disease was present in 4 cases. All of the 4 had history of contact with lepromatous leprosy.

**Table 1. Age- wise distribution of cases**

AGE (in years)	NUMBER OF CASES
<= 10	1
11-20	8
21-30	11
31-40	10
41-50	8
51-60	4
>60	3

**Regional distribution:** Majority of the patients (60%) hailed from the native resident population of Bagalkot district. 26.66% were from the neighboring districts of Karnataka and adjoining states. The remaining (13.33%) were migrants from Bihar and UP, two states that have provided foci of high endemicity for many years.

**Figure 1. Hypopigmented plaque with satellite lesion over lateral aspect of thigh**

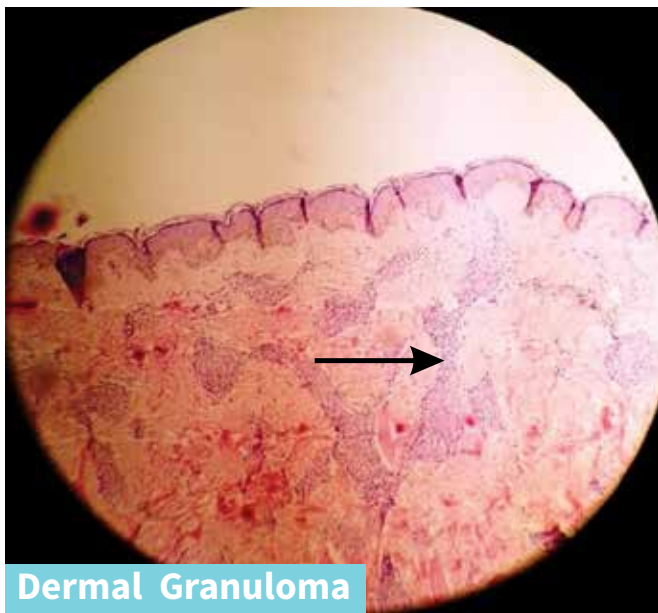


**Figure 2. Giant hypopigmented plaque over flexor aspects of lower thigh and leg**

**Duration of the disease:** The duration of the symptoms ranged from 5 months to 5 years. In 60% of the patients the duration was under one year.

**Clinical disease spectrum:** Borderline leprosy was responsible for maximum disease load in our patients with 25 patients in various spectrums of borderline disease followed by lepromatous (10/45) and tuberculoid leprosy (5/45). 4 patients presented with histoid leprosy. Indeterminate and pure neural leprosy was present in 3 and 2 patients respectively. Among the disease spectrum BT –Hansen’s disease was the commonest type seen in 21 of the total number of patients as shown in table 2. Clinical photo graphs as shown in figure 1 and 2.

**Figure 3. H&E (10x)-showing multiple tuberculoid granulomas in the dermis**



**Table 2. Leprosy spectrum among various patients**

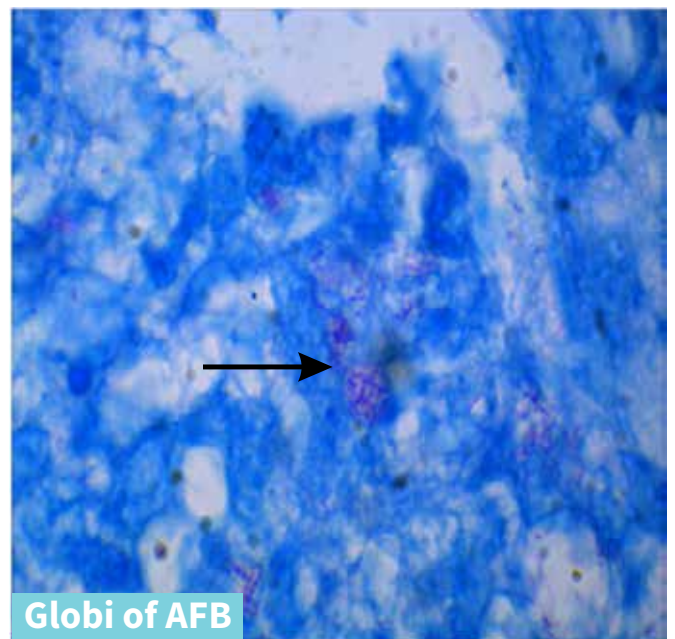
Spectrum	No. of Cases	Percentage (%)
Polar Tuberculoid (TT)	5	11.11
Borderline Tuberculoid (BT)	21	46.66
Mid Borderline (BB)	3	6.66
Borderline Lepromatous (BL)	1	2.22
Polar Lepromatous(LL)	10	22.22
Indeterminate Leprosy(I)	2	4.44
Pure Neuritic (PN)	3	6.66

**Contacts:** Overall, 6(13.33%) patients gave history of contact, of which 4 were household contacts and two were extra- familial. Among the contacts, the most common index were parents, grandparents or siblings and in one case a distant relative. One patient who presented with features of LL was a

leprosy field worker at a local PHC.

**Number and distribution of lesions:** Two to five patches were detected in 24(53.33%) and more than five patches in 11(24.44%) cases. The distribution of patches was predominantly over the exposed parts of the body with the following order of involvement: upper extremities 9(20%), face 11(24.4%) 8 – BT and 3-TT, and lower extremities 6(13.33%). Involvement of covered parts of the body such as trunk, thighs, buttocks and proximal arms was seen in 19 ( 42.22 %) patients.

**Slit skin smear:** SSS was positive in 11 (24.44%) cases of whom BI was greater than 6+ in 2(4.44%) patients.



**Figure 4. Slit Skin Smear (oil immersion under 40x field)**

**Classification:** In this study, 24(53.33%) patients presented with paucibacillary, 11(24.44%) with multibacillary disease and received corresponding WHO recommended MDT.

**Reactions:** Reactional episodes with or without neuritis occurred in 4 patients (8.88%) of which 2 developed type1 (reversal) reactions and 2 developed type 2 reactions with lesions of erythema nodosum leprosum. Highest number of reactions were observed in patients with PB leprosy. Of the two patients with reversal reaction one presented in reaction at the time of diagnosis and the other after a variable time of starting MDT. One patient with type 2 reaction had leprosy and presented with

ENL lesions at the time of diagnosis. The other had leprosy and developed ENL after starting MDT.

## Discussion

On 30<sup>th</sup> January 2006, India announced elimination of leprosy as public health problem at national level under the National Leprosy Eradication Programme (NLEP)<sup>[9]</sup>.

The present study indicates the high load of undiagnosed cases in the community. Leprosy affects people across all age groups. The incidence was maximum in the age group of 20-39 years (46.66%). We believe marriageable age as being one of the reasons for increased self reporting at this age especially to rule out vitiligo which has huge social stigma in this region of north Karnataka.

Leprosy is known to have a male preponderance. In our study too as compared to the study conducted by Jindal et al<sup>[10]</sup> in 2009 majority of the cases were males, 34 (75.55%) cases out of 45. This is the general pattern in India. Increased mobility, frequent interaction with community leads to increased opportunity for contacts. Also self reporting is higher among males. Local beliefs like taking a dip in holy water in a nearby village and illiteracy adds to the existing problem in both men and women alike.

Presence of overcrowding was found to be important factor in our study with 57.77% of patients living in overcrowded conditions and joint families. In 60% of the patients the duration of the disease was under one year.

One important finding in this study is that majority of the patients are PB type and on histological examination the most common pattern was found to be BT pattern. This is in accordance with other studies (Mahajan et al 2003, Singh et al 2009)<sup>[11,12]</sup> where BT was found to be the commonest spectrum of leprosy in India. The slit skin examination was found to be positive in 11 (24.4%) of the cases. PB leprosy being higher in our study could be due to several reasons which cannot be overlooked. Early detection of cases (voluntary reporting) because of stigma, active searching is also better in our area by health care and anganwadi workers, door to door survey by house surgeons and postgraduates from preventive and social medicine department. Referral by primary health care centers to our center, and importantly cross referencing from other specialties are some of the attributable causes for this result.

The referred cases are investigated thoroughly by SSS and confirmed by biopsy and histopathological examination with well experienced pathologists which adds to decreased transmission rates in the otherwise already known fact of paucibacillary cases.

Number of patients presenting with deformities during the study period were less 4/45 (8.88%) as evident by the large number of PB cases which is mainly because of early detection of cases as described above. Indeterminate leprosy is reported in 2 (8.88%) cases in the study. This is due to parents not consenting for biopsy, hence missed which adds to difficulty in diagnosis and also some indeterminate cases resolves spontaneously.

Delivery of better health care system and management of better quality leprosy services can shoulder to a great extent while good referral system can bring faith in the minds of masses. Political will power, vision and mission of the government can prove to be a guiding star and strategies for eradication, elimination and prevention of the disease by professional community should go hand in hand in perfect harmony with the government.

**Conclusion:** Eradication of leprosy may be a politically desirable aspiration but the scientific case for such a strategy cannot be justified at the moment. Overzealous attempts to achieve elimination of leprosy at all levels and the pressure to achieve desired results by stipulated date has resulted in declaration of leprosy as eliminated under various programs. The clinical, bacteriological and histopathological characteristics of newly detected cases in the present study evidently indicate the grave nature of the problem. However large number of new cases have been detected in recent years because of adoption of new strategy, modified leprosy elimination campaign (MLEC) and effective health education campaign (Mandal 2001)<sup>[13]</sup>. Early detection of cases is due to better awareness in the community about the disease. Mahajan et al 2003, Pardillo et al (2007)<sup>[11,14]</sup>. This study helps in concluding that leprosy is still not eliminated. BT type was found to be the most common pattern. The current reality is that there is need to sustain and provide quality leprosy services to all persons through general health system, including good referral system. Efforts need to be made to reduce deformity through early

detection, self care, physiotherapy, and developing sound surveillance systems. The decision regarding declaration of strategies pertaining to eradication, elimination or control should be left to scientific scrutiny and techno- managerial considerations. In order to sustain “elimination”, current leprosy control activities should be continued with full force even. Active surveillance is still needed to detect the subclinical cases and undiagnosed cases.

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