

Incidence and clinical spectrum of Leprosy in a tertiary care centre in Jharkhand: A retrospective study

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Abstract:

Leprosy is a chronic disease caused by *Mycobacterium leprae* and has been known since biblical times. It is still endemic in many regions of the world and as a result a major public health problem. The mechanism of transmission of leprosy consists of prolonged close contact between susceptible and genetically predisposed individuals and untreated multibacillary patients.

Objective: Aim and objective of this study is to assess the occurrence, types and complications of Hansen's disease in our institute.

Materials and methods: Retrospective study was conducted from June 2017-January 2020 to assess the total number of Leprosy cases presenting to our OPD, Department of Dermatology, Venereology and Leprosy, RIMS, Ranchi, Jharkhand. Also the type and complications of the disease were noted.

Results: Total number of new cases presented during the study period were 1067. Out of which 59.04% were males and 40.57% were females. Multibacillary leprosy was much more common than paucibacillary leprosy. Most common type according to Ridley Jopling was Borderline Borderline type. The most common nerve involved was Ulnar nerve.

Conclusion: This study highlights that the incidence and complications of leprosy still continues to be a big public health problem and its early diagnosis is necessary to limit the disabilities.

Keywords: leprosy, *Mycobacterium leprae*, Multibacillary, Hansen's disease, retrospective study, Ridley Jopling classification, paucibacillary, ulnar nerve

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I. Introduction

Leprosy also known as Hansen's disease and is the oldest disease known to mankind. In India, leprosy was first described in Sushrut Samhita written in 600BC. [1] It is a chronic disease caused by *Mycobacterium leprae*, infectious in some cases and affects the skin, peripheral nervous system and certain other tissues. Although it was declared eliminated from India on 31st December, 2005, Hansen's disease still continues to be a major cause of morbidity especially in Eastern India. [2] In April 2013, a total of 92,000 cases were recorded. The WHO expert committee on leprosy has defined a case of leprosy as an individual who has one of the following cardinal signs of leprosy: [3]

- a. A definite loss of sensation in a hypopigmented or reddish skin patch
- b. A thickened or enlarged peripheral nerve with a loss of sensation and/or weakness in the muscles supplied by the nerve
- c. The presence of acid fast bacilli in a slit skin smear

In 1966, Ridley Jopling [4] proposed a classification system for leprosy. It classifies leprosy as an immune mediated spectral disease with tuberculoid leprosy (TT) at one end and lepromatous leprosy (LL) at other end of the spectrum. Strong cell mediated immunity correlates with TT type and weak CMI correlates with LL type. Between these poles lie the BT, BB and BL types. The WHO classification of leprosy into multibacillary and paucibacillary types is simply based on the total number of leprosy lesions in a given

patient. The sensitivity and specificity of WHO classification has been reported to be around 90%.^[5] In India, number of nerves involved along with the number of skin lesions are taken into consideration in the classification of leprosy into PB and MB cases. This classification system was developed by National Leprosy Eradication Program(NLEP) and the WHO^[6]

Ridley Jopling Classification (1966)	WHO Classification (1981)
Tuberculoid leprosy (TT) Borderline tuberculoid (BT)	Paucibacillary Leprosy up to 5 skin lesions SSS negative on all sites
Borderline borderline (BB) Borderline lepromatous (BL) Lepromatous leprosy (LL)	Multibacillary Leprosy 6 or more skin lesions SSS positive at any site

Table 1. Leprosy classification: Ridley Jopling and WHO

Paucibacillary leprosy	Up to 5 skin lesions; No nerve / single nerve involvement with five lesions (including nerve). Skin smear negative at all sites.
Multibacillary leprosy	6 or more skin lesions. More than one nerve involvement, irrespective of the number of skin lesions. Skin smear positive at any site.

Table 2. NLEP Classification, India (2009)

INDIAN CLASSIFICATION: It was accepted and adopted in India in 1955.^[7] The aim of Indian system was to include all levels of leprosy workers from grass-root workers to researches. The Indian classification includes six groups:

- i) tuberculoid
- ii) borderline
- iii) lepromatous
- iv) indeterminate
- v) pure neuritic
- vi) maculoanaesthetic

COMMON CLINICAL FEATURES OF LEPROSY: ^[3] leprosy should be suspected in people with any of the following symptoms and signs:

- hypopigmented or erythematous patch(es) on skin
- loss or decrease of sensation in the skin patch(es)
- numbness or tingling of hands/feet
- painful or tender nerves
- nodules on face ,trunk or extremities
- edema of the hands and/or feet
- painless wounds or burns on hands or feet

II. Aims And Objectives

To determine the occurrence , type and complications of Hansen's disease in a tertiary care centre of Jharkhand.

III. Materials And Methods

This study was hospital based retrospective study. It included all new patients visiting the OPD of Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. Study period was from June 2017- January 2020 (31 months). The inclusion criteria was all new patients presenting with signs and symptoms of Hansen's disease during the study period and who were diagnosed as a new case of Hansen's disease. The exclusion criteria were all patients other than Hansen's disease or old cases of Hansen's disease who were removed from treatment or were already started with treatment. The case records of the OPD register were thoroughly analysed and new cases of Hansen's disease were noted. The age, sex, mode of presentation , number of skin patches , nerve enlargement with or without pain and tenderness, slit skin smear examination and history of reactions were

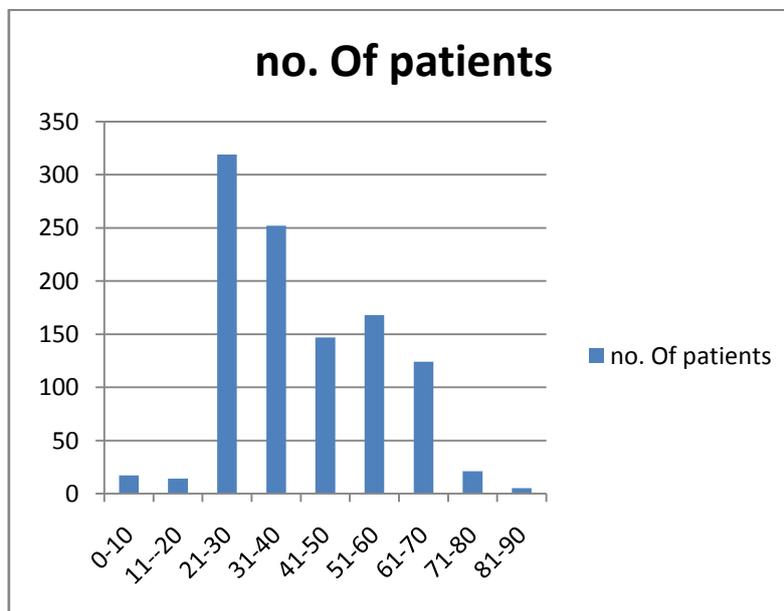
noted for all patients. Also history of leprosy among close contacts were noted. The cases were classified as per Ridley Jopling classification.

IV. Results And Observations

Total number of new cases presenting during the study period were 1067. Out of this 630 (59.04%) were males and 437(40.57%) were females. There were 22 (2.061%) children among the diagnosed cases. Out of 1067 cases, majority i.e. 863(80.88%) were multibacillary and rest 204(19.12%) were classified as paucibacillary leprosy. There were 17(1.59%) patients in the age group of 1-10 years, 14 i.e. 1.35% patients between ages 11-20 years, 319(29.89%) patients in the age group of 21-30 years, 252(23.59%) patients in the age group of 31-40 years, 147(13.70%) patients in the age group of 41-50 years, 168(15.72%) patients in the age group of 51-60 years, 124(11.68%) patients in the age group of 61-70 years, 21(2.02%) patients in the age group of 71-80 years and only 5(0.45%) patients in the age group of 81-90 years. Thus maximum number of patients were between **21-30 years**. The youngest patient was 7 years old and eldest was 85 years old.

Age group	No of patients	Percentage
0-10	17	1.59%
11-20	14	1.35%
21-30	319	29.89%
31-40	252	23.59%
41-50	147	13.70%
51-60	168	15.72%
61-70	124	11.68%
71-80	21	2.02%
81-90	5	0.45%

Table 3. showing age distribution among patients

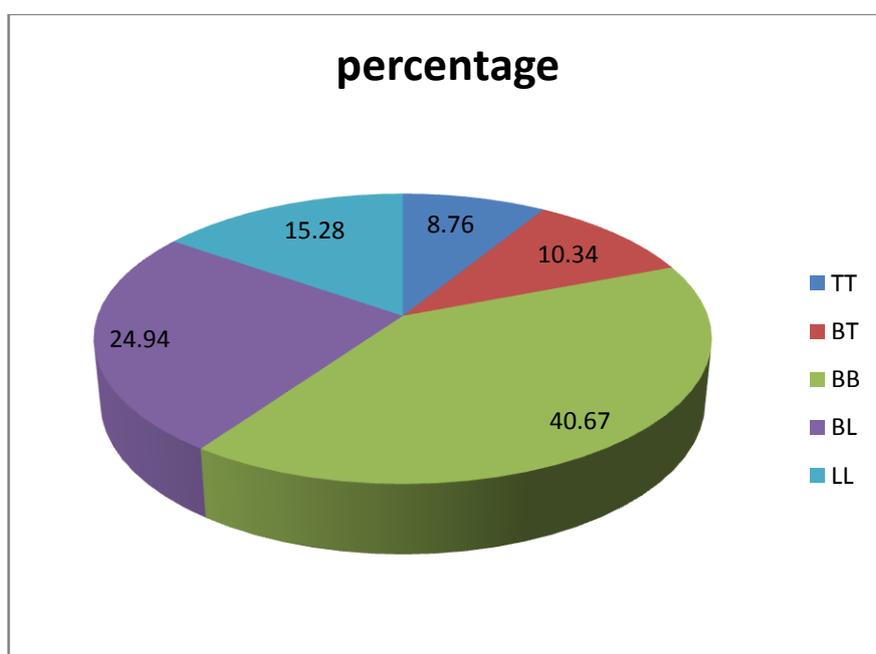


Graph 1. showing age distribution among patients

According to Ridley Jopling Classification, the most common type of leprosy was BB type with 435 (40.67%) patients. The second commonest was BL type with 266(24.94%) patients followed by LL type with 163(15.28%) patients, then BT type with 110(10.34%) patients and the least common type was TT with 93(8.76%) patients.

Type acc to Ridley Jopling Classification	No of patients	Percentage
TT	93	8.76%
BT	110	10.34%
BB	435	40.67%
BL	266	24.94%
LL	163	15.28%

Table 4. showing types of leprosy among the patients

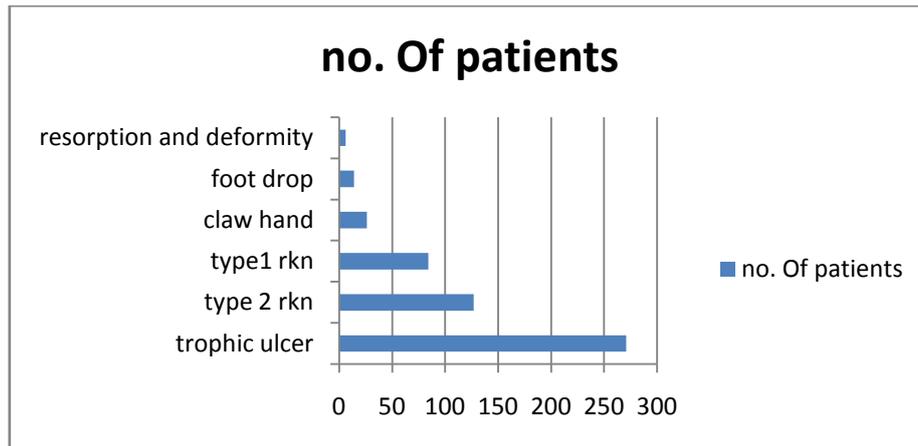


Graph 2. showing types of leprosy among the patients

A total number of 528 patients out of 1067, presented with complications of leprosy. The most common complication was trophic ulcer. 271(25.39%) patients presented with trophic ulcer associated with Hansen's disease. This was followed by type 2 reaction which was second most common complication in our study with 127(11.91) patients presenting with it. This was followed by type 1 reaction with 84(7.86%) patients. 26(2.47%) patients presented with claw hand, 14(1.35%) patients presented with foot drop as a result of involvement of lateral popliteal nerve . 6(0.6%) patients presented with resorption and deformity.

Type	No. of patients	Percentage
Trophic ulcer	271	25.39%
Type 2 reaction	127	11.91%
Type 1 reaction	84	7.86%
Claw hand	26	2.47%
Foot drop	14	1.35%
Resortion and deformity	6	0.6%

Table 5. showing patients presenting with complications of leprosy

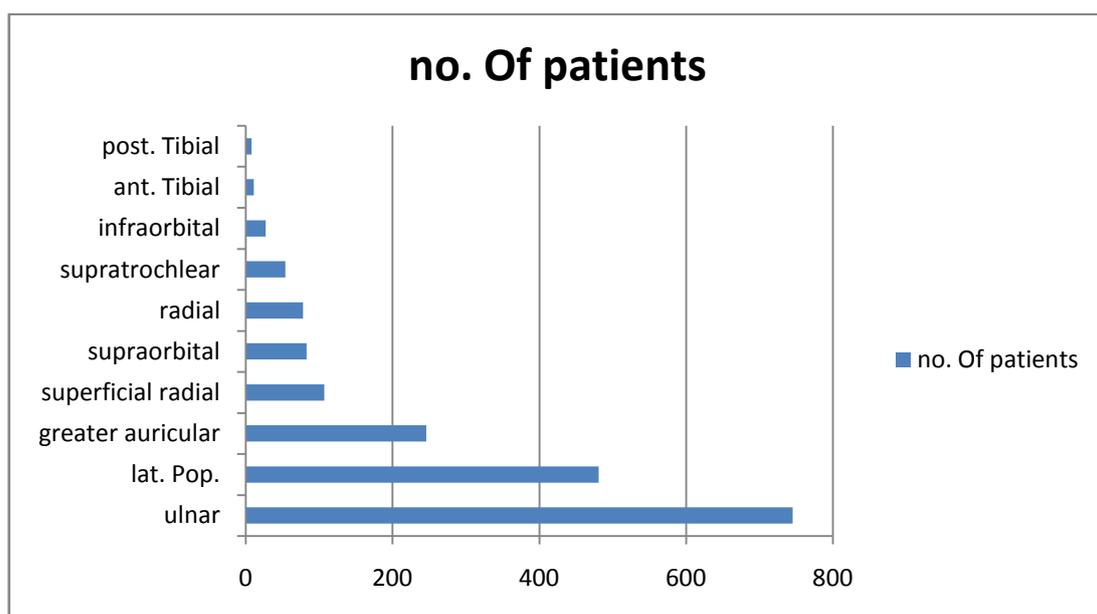


Graph 3. showing patients presenting with complications of leprosy

The most common nerve to be involved was Ulnar nerve. 745 patients had enlarged ulnar nerve on palpation. Next most common nerve to be affected was lateral popliteal nerve enlarged in 481 patients. 246 patients presented with Greater auricular nerve enlargement, 107 patients with superficial radial nerve enlargement, 83 with supraorbital nerve, 78 with radial, 54 with supratrochlear, 27 with infraorbital, 11 with anterior tibial and 8 patients presented with posterior tibial nerve enlargement.

NERVE	NO. OF PATIENTS
Ulnar	745
Lateral popliteal	481
Greater auricular	246
Superficial radial	107
Supraorbital	83
Radial	78
Supratrochlear	54
Infraorbital	27
Ant. Tibial	11
Post. Tibial	8

Table 6. showing pattern of nerve involvement in patients



Graph 4. showing pattern of nerve involvement in patients

The most common mode of presentation was a hypopigmented patch with hypoaesthesia. 9.43% patients had a close contact.



pic.1.multiple, hypopigmented patches



pic.2.solitary hypopigmented patch



pic.3. erythematous plaque with raised borders



pic. patch with hypopigmented with raised erythematous borders



pic.5. claw hand



pic.6. trophic ulcer



pic.7. boat shaped feet



pic.8. type 1 reaction



pic.9.erythematous nodules



pic.10. erythematous nodules

on face

**on trunk and
extremities**

(type 2 reaction)

V. Discussion

A total of 1067 patients were registered as new cases of Leprosy in our centre during the study period. This was higher compared to 849 patients registered in a study of 5 years duration in a tertiary care centre in Delhi in 2015 by Chhabra et.al [18]. The higher number is attributable to Leprosy being endemic in Jharkhand and also because there are fewer tertiary care centres in Jharkhand as compared to Delhi.

Our study showed slightly higher preponderance in males which is consistent with previous study by Gangwar and Gupta et.al. in 2017.

This indicates greater vulnerability and more mobility, hence increased chances of exposure to open cases of leprosy. In our study, most people were middle aged 21-40 years, 2.94% were children and adolescents less than 20 years of age. This was comparable with the study of Thakkar and Patel(2014) [8] which showed higher preponderance of leprosy in males and middle aged patients. Positive family history of contact was found

to be 9.43% which was comparable to Gangwar and Gupta(9.4%), Salodkar and Kalla 1995(9.5%)^[9] as well as with study by Thakker and Patel (8.3%) (2014)^[8]

In our study, hypopigmented patch was the most common presentation which was same as clinical feature in study by Verma (1976)^[10], Murthy(2000)^[11] and Gangwar and Gupta(2017)^[12]

In our study, multibacillary cases were 80.88% of total cases whereas paucibacillary cases were only 19.12%. This was different from the observations in study by Suri et. al. 2014^[13] and Gupta and Gangwar et.al 2017^[12] where majority of cases were paucibacillary. This difference may be due to the difference in geographical areas where the studies were conducted.

After conducting the study, we came to the conclusion that Borderline Borderline type was the most common type of leprosy according to Ridley Jopling classification. This was comparable with the results of the study in Shenoi and Sidappa(1988)^[14], Nadkarni and Rege (1999)^[15], Moorthy et al (2001)^[16] and Sharma et al (2008)^[17]

In our study, trophic ulcer was the most common complication whereas in a study by Chhabra et.al, deformity of the hands and feet was the most common complication^[18]

Ulnar nerve was the most common nerve involved followed by lateral popliteal nerve which is comparable to the observations by Chhabra et. al 2015^[18]

VI. Conclusion

On the basis of our study we can state that the incidence of Leprosy is still very high in Jharkhand. Despite elimination, multibacillary disease, reactions and deformities are commonly seen. In order to reduce its incidence and prevalence as well as to limit its disabling complications, early diagnosis and prompt treatment are necessary.

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