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## Original Research Article

# Clinical and microbiological profile of Hansen's diseases in a tertiary care centre of southwest Bihar

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## ABSTRACT

**Background:** Leprosy or Hansen's disease is a slowly progressive infection caused by mycobacterium Lepra. It has been reported from Bihar that false positive diagnosis is a major issue and decline in false positive diagnosis is not statistically significant. Present study has been designed primarily to study the clinical presentation and microbiological profile of patients presenting with symptoms of Hansen disease and secondarily to know the smear positivity of patients with clinical manifestation of leprosy.

**Materials and Methods:** After enrolment of patients a detail clinical examination was done and demographic information of patient was recorded on predesigned Performa. After taking consent from enrolled patients slit skin smear was obtained as pre standard protocol.

**Results:** All patients below 20 years of age were slit smear staining smear negative for AFB. In our study 55(38.19%) patients with clinical manifestation were from 31 to 50 years of age among them 18(30 % of total AFB positive) was AFB positive. Among 30 patients with 16 (53.34%) patients have bacteriological index 6+ and 8 patients have bacteriological index 1+.

**Discussion and Conclusion:** From present study we can conclude that there was male predominance and in most of the patients who were smear staining positive have bacteriological index more than 6+. Most common age group presented with clinical symptom and AFB positive were in 3<sup>rd</sup> and 4<sup>th</sup> decade of life. Hypopigmented macules were common presentation and AFB positive was most frequent in them.

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## 1. Introduction

Leprosy or Hansen's disease is a slowly progressive infection caused by mycobacterium Lepra. It is a chronic granulomatous disease that primarily effect skin. Mycobacterium leprae causes two strikingly different patterns of disease tuberculoid and lepromatous which is determined by T-helper lymphocyte response to it.<sup>1,2</sup>

Leprosy is oldest recognised disease of civilisation and considered as contagious, mutilating and incurable. It has a terrifying image in the history as patient develops deformity and excluded from the society.<sup>3</sup> But with the effort of World health organisation and government of individual country and introduction of MDT it became curable and deformity

was prevented. Now WHO has launched "Global Leprosy Strategy 2016–2020: Accelerating towards a leprosy-free world".<sup>3</sup> Bihar is state in India share high number of leprosy cases having prevalence rate of 1.18 (21,353 new cases) in 2017-18.<sup>4,5</sup>

After going through various literatures we have found that there are different views among researcher about clinicoepidemiology and microbiological profile of Hansen disease in India. Semwal S, Joshi D, Goel G, Asati D, Kapoor N from central India has reported that early clinical detection, and morphological diagnosis is a challenge in new patients. He has further added that histological finding should be correlated with clinical finding.<sup>6</sup> Thakkar S, Patel SV from Gujarat has reported that histopathological finding is must in doubtful cases.<sup>7</sup> Ramesh Marne Bhat, Prakash Chaitra study from south India points towards

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high circulation of lepra bacilli in the community in the elimination era of Hansen disease.<sup>8</sup> Wagh AN, Mugudalabetta S, Gutierrez NO, et al has pointed towards a serious concern about community-based leprosy case detection campaigns in Bihar. "They have reported from Bihar that false positive diagnosis is a major issue and decline in false positive diagnosis is not statistically significant."<sup>9</sup>

Present study has been designed primarily to study the clinical presentation and microbiological profile of patients presenting with symptoms of Hansen disease and secondarily to know the smear positivity of patients with clinical manifestation of leprosy.

### 2. Materials and Methods

This is a prospective cross sectional observational study conducted in the department of dermatology and microbiology Narayan Medical College and Hospital Jamuhar, Rohtas.(Bihar) from September 2018 to August 2020.

#### 2.1. Ethics

Before start of this study an approval from institutional ethics committee was taken. A written informed consent was obtained from all patients before enrolling them for study.

#### 2.2. Selection of patients

During the study period patients attending dermatology outpatient department with the clinical manifestation of Hansen disease were enrolled for this study. Patients who were diagnosed previously and taking treatment were excluded from this study. Based on these criteria 144 patients were enrolled for this study.

#### 2.3. Method

After enrolment of patients a detail clinical examination was done and demographic information of patient was recorded on predesigned Performa. After taking consent from enrolled patients slit skin smear was obtained as pre standard protocol. Smears were stained with modified Ziehl-Neelsen stain 0.5% Sulphuric acid was used as decolouriser. Slide was examined under oil emersion microscope. Ridley’s logarithmic scale was used for Bacteriological Index (BI).<sup>10,11</sup>

#### 2.4. Statistical analysis

Data were recorded in excel sheet and statistical Analysis was done with software SPSS-14 version. Quantitative data were calculated as percentage and proportions.

### 3. Result

In present two year prospective observational study 32884 patients were attended dermatology OPD and out of them 144 patients have clinical manifestation of Hansen’s disease that was 0.43% of total dermatological OPD.

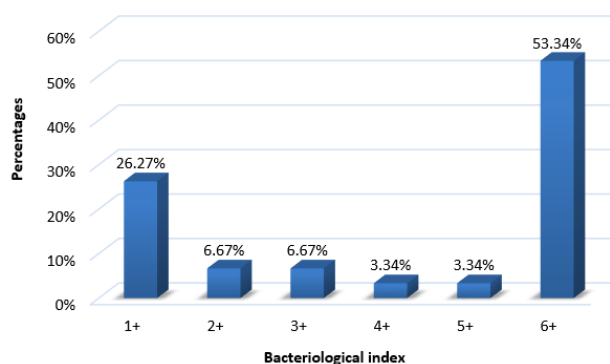
**Table 1:** Demography of the patients

Variables	Number	Percentage	
Total OPD patients in DVL in study period	32884	100%	
Patients with clinical manifestation of leprosy	144	0.43%	
Number of Slit skin smear done for AFB	144	100 %	
Finding of staining	Negative	114	79.16%
	Positive	30	20.83%
Sex	Male	100	69.44%
	Female	44	30.55%

All patients with clinical manifestation were underwent slit smear examination for acid fast bacillus. Among these 144 patients, 114 (79.16%) patients were slit skin smear for AFB negative and rest 30 (20.83%) were positive for AFB. There was male predominance (69.44% vs 30.55%).

**Table 2:** Distribution of bacteriological index of smear among AFB positive patients

Bacteriological index	Number	Percentage
1+	8	26.27%
2+	2	6.67%
3+	2	6.67%
4+	1	3.34%
5+	1	3.34%
6+	16	53.34%



**Fig. 1:** Distribution of bacteriological index

Among 30 patients with 16 (53.34%) patients have bacteriological index 6+ and 8 patients have bacteriological index 1+. Bacteriological index 2+ and 3+ was present in 6.675 % patients each.

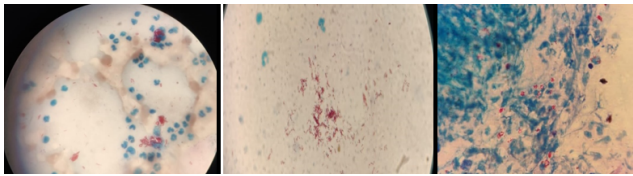


Fig. 2: Microbiological study of lesions

Table 3: Relation between age and smear positivity

Age of patients	Smear staining done (n=144)	AFB positive (n=30)
0-10	3(2.028%)	0
11-20	24(16.66%)	0
21-30	33(22.91%)	6(20%)
31-50	55(38.19%)	18(60%)
51 and above	29(20.13%)	6(20%)

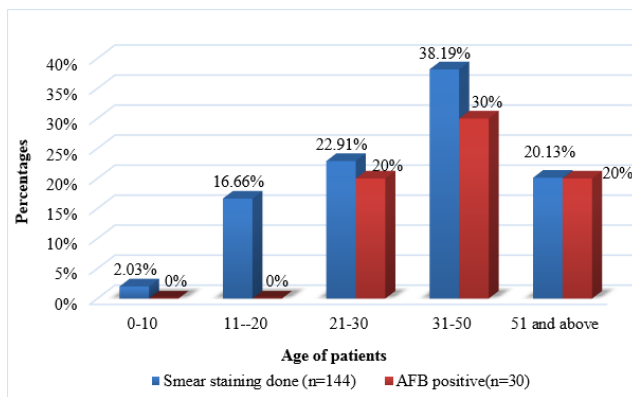


Fig. 3: Relation between of smear staining done, AFB positivity and age.

All patients below 20 years of age were slit smear staining smear negative for AFB. In our study 55(38.19%) patients with clinical manifestation were from 31 to 50 years of age among them 18(30 % of total AFB positive) was AFB positive. Number of patients from 20 to 31 years was 22.91% and among them 6(20% of total AFB positive) were slit smear positive for AFB. Similarly 29 22.91% patients above 51 years of age was and among them 6(20% of total AFB positive) were slit smear positive for AFB.

Table 4: Clinical presentation of patients and smear positivity

Type of lesion	Total patients	Smear positive
Nodule/plaque	12(8.34%)	7(23.34%)
Hypopigmented macule	122(84.72%)	22(73.34%)
Loss of sensation	10(6.94%)	1(3.34%)

Regarding type of lesion as per Table 4, nodule and papule was present in 12(8.34%) patients out of them 7 (23.34% of total AFB positive) were smear staining positive for AFB. Hypopigmented macule was present in

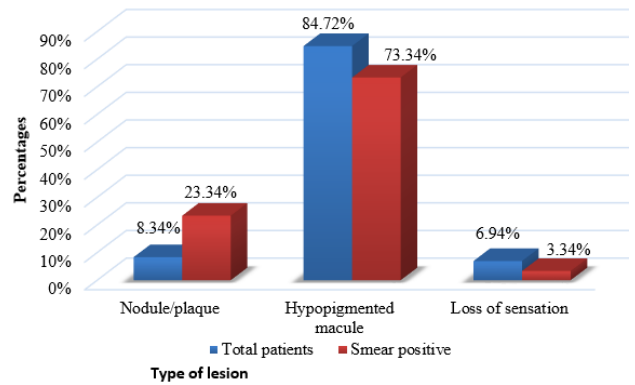


Fig. 4: Distribution of clinical, presentation



Fig. 5: Clinical presentation of leprosy,

122(84.72%) patients out of them 22 (73.34% of total AFB positive) were smear staining positive for AFB. Loss of sensation was present in 10(6.94%) patients out of them only 1 (3.34% of total AFB positive) was smear staining positive for AFB.

#### 4. Discussion

Hansen's disease is a slowly progressive chronic granulomatous disease caused by Mycobacterium Leprae. Appropriate diagnosis with histopathological correlation has become essential in present situation when the cases of Hansen's disease are on decline. In present study we have observed that out of all patients attending dermatology

in two year duration 0.43% patients were presented with clinical manifestation of Hansen's disease and we have taken sample for slit smear staining from all patients. Among 144 patients 20.83% were AFB positive and there was male predominance. Mahajan R, Ninama K, et al has reported 112 cases in one year duration, Tralsawala K, Umrigar D. et al reported 329 cases in his 5 year of study and Das NK, De A, Naskar B et al has reported 114 cases in his 2 year of study. So there is variation in the number of cases in various studies from different region of India. But in all study there is male predominance which supports our study.<sup>12–14</sup> In our study 20.83% patients has slide positive for AFB, it is higher in the study (38%) of Subhash Bishnoi et al but supported by the work of Giridhar, M & Arora et al (21%).<sup>15,16</sup>

We have observed that most of the patients (53.34%) have lesions with bacteriological index 6+, and 26.27% patients have bacteriological index 1+. Bacteriological index 2+ and 3+ was present in 6.675 % patients each and bacteriological index 4+ and 5 + was present in 3.34% patients. So in our study patients with high bacterial load is more in our community. This finding is supported by the work of Ghosh, R.R. & Sikdar, S. & Ghosh, A.P. & Chatterjee, M.. (2018) et al and Kilikdar, M., Gedam, D., Pisey, A., Ambhore, N., & Karykarte, R et al.<sup>17,18</sup> Vinay KN, Hedge SG et al from south India reported that in his study patient with bacteriological index 1+ were most common.<sup>19</sup>

Most common age group presented with clinical symptom and AFB positive were in 3<sup>rd</sup> and 4<sup>th</sup> decade of life. Ages below 20 years was less commonly effected and were AFB negative. Which corroborates with the study of Jindal, Nidhi & Shanker et al and Kalita JM, Nag VL, Yedale K et al.<sup>20,21</sup>

Regarding clinical presentation Hypopigmented macule were common presentation and AFB positive was most frequent in them which is supported by the work of Moorthy BN, Kumar P et al.<sup>22</sup> Roy P, Dhar R, Patro P et.al has reported that multiple well-defined hypopigmented plaques with loss of sensations was more common lesion in his study which partially support our study.<sup>23</sup>

## 5. Conclusion

From present study we can conclude that there was male predominance and in most of the patients who were smear staining positive have bacteriological index more than 6+. Most common age group presented with clinical symptom and AFB positive were in 3<sup>rd</sup> and 4<sup>th</sup> decade of life. Hypopigmented macules were common presentation and AFB positive was most frequent in them. So even in post eradication era patients with high bacterial load were common and microbiological and histopathological examination is important to reduce false positive diagnosis.

## 6. Source of Funding

No financial support was received for the work within this manuscript.

## 7. Conflict of Interest

The authors declare they have no conflict of interest.

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