

EPIDEMIOLOGY OF DISABILITY IN INCIDENT LEPROSY PATIENTS AT SUPERVISORY URBAN LEPROSY UNIT OF NAGPUR CITY

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ABSTRACT

Leprosy is a chronic infectious disease caused by *Mycobacterium Leprae*, affecting mainly peripheral nerves and skin. Disabilities and deformities are major concerns as it triggers social, economic and psychosocial problems of leprosy patients. In the study, 105 incident leprosy patients registered in a randomly selected Supervisory Urban Leprosy Unit during year 2004-05 were interviewed. Disability was graded as per WHO-2 point scale. There were 52 male and 53 female with median age of 26 years. The WHO grade -II disability was 12.38 % and it was significantly higher among manual workers and housewives (76.92%, $P<0.05$). Hands and feet disabilities were found in 38.10 % while nobody had eye related disability. Subjects with delayed diagnosis beyond 12 months had significantly higher grade-2 disabilities than diagnosed earlier ($P<0.05$). Disability rate was also higher in Multi-Bacillary leprosy patients ($P<0.001$). Ulcer was the most common type of grade-II deformity (61.54 %) which was significantly higher in females ($P<0.05$). Prevalence of disability was found higher in study area than national average. Awareness about Prevention Of Deformities (POD), early diagnosis (<12 months) and treatment are recommended to avert visible deformities and hence social stigma in leprosy patients.

Key Words: Leprosy, Deformity, Epidemiology, Disability

INTRODUCTION

Leprosy is a chronic infectious granulomatous disease caused by *Mycobacterium Leprae*, affecting mainly peripheral nerves and skin. As a single disease entity, leprosy is one of the foremost causes of deformities and crippling. The deformities may result due to the disease process (e.g. loss of eye brows, other facial deformities), or those resulting from paralysis of some muscle due to damage to peripheral nerve trunk (e.g. claw-hand, foot-drop, lagophthalmos), or those resulting from injuries or infection to hands or feet (e.g. scar contractures of fingers, mutilation of hands and feet, corneal ulceration).¹

The present MDT regimen used for treating leprosy was introduced in the early 1980's, since then the prevalence has drops down significantly. In Nagpur, since introduction of M.D.T. in July 1988 – 89 during phased manner, the Prevalence Rate has reduced from 82 per 10,000 in 1988-89 to 2.8 per 10,000 populations on 1st April 2003. The proportion of cases with visible deformity (grade- 2) was 1.8% in India and 1.53% in Maharashtra state.²

However, social stigma remains a major obstacle to self-reporting and early treatment. Patients are compelled to hide their condition and avoid diagnosis, allowing a completely curable disease to worsen to the point of disfigurement. This study was conducted to

explore various epidemiological factors of deformities associated with leprosy in Nagpur city.

OBJECTIVE

- 1) To study the prevalence of disabilities as per the WHO definition in newly detected leprosy patients.
- 2) To study selected epidemiological factors of disabilities in newly detected leprosy patients in Nagpur city.

METHODOLOGY

Study was carried out in Supervisory Urban Leprosy Unit (SULU)-II allotted randomly out of three SULUs in the Nagpur city. This SULU covers 8 Urban Leprosy Centers and having population of 443,042 (Census-2001).

The study was conducted for the period from April 2004 to March 2005. All new cases of leprosy registered under the SULU during this period were taken in to the study. Detailed addresses were obtained from their respective

urban leprosy center with the help of Non Medical Assistant. House to house visit was carried out to collect data from leprosy patients. Pre tested Performa was used to collect data. Personal interview of each case was carried out within one month of registration. Two rounds of home visits were carried out at each family to have maximum coverage. A thorough clinical examination of the leprosy cases were done with the help of Female Social Worker. All type of disability related to leprosy were recorded. Disability grading was done as per WHO-2 point scale. The observations were analyzed using Epi-info 2002 software.

RESULTS

Under the eight urban leprosy centers of Supervisory Urban Leprosy Unit -II, total 119 new cases of leprosy were registered during the period April 2004 to March 2005. Out of which, we are able to contact 105 patients which were finally analyzed. The data obtained was analyzed using different variables.

Table 1: Distribution of leprosy cases according to age, sex and type of leprosy

Age in years	Type of leprosy						Total (%)
	PB			MB			
	Male	Female	Total (%)	Male	Female	Total (%)	
≤15	6	9	15 (26.32)	2	2	11 (20.76)	19 (18.10)
16 - 30	11	10	21 (36.84)	11	9	19 (35.84)	41 (39.05)
31 - 45	6	5	11 (19.30)	2	6	11 (20.76)	19 (18.10)
46 - 60	4	4	8 (14.04)	4	3	7 (13.21)	15 (14.29)
≥ 60	1	1	2 (3.50)	5	4	5 (9.43)	11 (10.46)
Total	28	29	57 (54.29)	24	24	53 (50.47)	105 (100)

Overall 75(71.44%) cases were between the age group of 16-60 years, which is economically productive age group. The average age of disease onset was 32.81 (SD 9.65) years ranging from 5 years to 80 years. The median age of leprosy was 26 years. Leprosy cases are almost equally distributed in both the genders. Leprosy cases were clinically classified into Paucibacillary and Multibacillary leprosy according to WHO study group on chemotherapy of leprosy 1993. (3) Table 1 reveals that PB cases reported higher in newly registered patients.

The disability rate found to be 38.10 % for Hands and Feet. Eye disability was not found in any Leprosy patient. The WHO grade -2

disabilities among incident leprosy patients was 12.39%. Disability rate was more in Multi-Bacillary leprosy patients than in Paucibacillary (P<0.001).

Table 2: Distribution of leprosy cases according to WHO grading of disability³

Grade of disability for limbs	PB (%)	MB (%)	Total (%)
Grade - 0	46(80.7)	19(39.6)	65(61.9)
Grade - 1	10(17.5)	17(35.4)	27(25.7)
Grade - 2	1(1.7)	12(25.0)	13(12.4)
Total	57 (54.3)	48 (45.7)	105 (100)

(Grade 0 Vs Grade 1 & 2) P<0.001

Average delay in diagnosis of leprosy cases was 11.15 months, (range 0 to 66 months). The median delay in diagnosis of leprosy cases was 11 months. Subjects with delayed diagnosis

beyond 12 months had significantly excess grade-2 disabilities than diagnosed within 12 months ($P < 0.05$).

Table 3: Leprosy cases according to Delay in diagnosis and disability grading

Delay in diagnosis*	Disability Grading		Total (%)
	Grade-1 (%)	Grade-2 (%)	
Less than or equal to 12 months	21 (77.8)	4 (30.8)	25 (62.5)
More than 12 months.	6 (22.2)	9 (69.2)	15 (37.5)
Total	27 (67.5)	13 (32.5)	40 (100)

$P < 0.05$ (*Delay in diagnosis (10): period between awareness of first sign/symptom to the start of MDT)

A grade-II disability among Manual workers and Housewives out of total was 76.92%, which is significantly greater than others ($P < 0.05$). The odds in favor of Grade-2 disabilities are 3.49 times high among Manual workers and Housewives as compared to others.

Most common type of grade-II deformity was Ulcer (61.53 %). Ulcer deformity was significantly higher in females than males ($P < 0.05$).

Table 4: Leprosy cases according to type of Grade II deformity and Gender

Type of deformity	Male (%)	Female (%)	Total (%)
Ulcer	1 (20.0)	7 (87.5)	8 (61.5)
Clawed finger/s	2 (40.0)	1 (12.5)	3 (23.1)
Clawed hand	1 (20.0)	0	1 (7.7)
Clawed hand and Ulcer	1 (20.0)	0	1 (7.7)
Total deformities	5 (46.2)	8 (53.8)	13 (100)

(Ulcer Vs Non ulcer deformity $P < 0.05$)

Table 5: Leprosy cases according to occupation and Grade -2 disabilities

Occupation	Grade- 2 disabilities (%)	Grade -1 or Grade - 0 disabilities (%)	Leprosy cases (%)
Manual workers and Housewives	10 (76.92)	37 (41.11)	47 (45.63)
Others with small-scale business, private job, students, and unemployed and in government job sectors.	3 (23.08)	53 (58.89)	56 (44.37)
Total	13 (100)	90 (100)	103* (100)

(Housewives & Manual workers Vs Rest of all disability $P < 0.05$) OR: 3.49 (95% CI 1.23-8.46)

* Occupation data was not available for 2 patients

DISCUSSION

The average age of onset of disease reported by Kaur S et al (1982) ⁴ and Atsuro Tsutsumi et al (2003) ⁵ was 35.07 years and 36.4 years respectively, which is slightly higher than present study.

Similar to current study findings of almost equal males: female ratio, Stella, Van M Beer et al (1999) ⁶, Mathew VG et al (2002) ⁷ and Chaturvedi RM et al (1988) ⁸ had also reported similar male: female ration.

Higher PB:MB ratio was observed in the present study which is higher than Kyaw Tin study ⁹,

may be because of intensive case findings activities during the survey period giving predominance of PB cases than MB type.

Current study find 12.39% grade-2 disability rate which is much greater than national and state average. The incidence and number of deformities or disabilities increases as the disease lasts longer. Nerve thickening has often been associated with deformities, which is more common in MB patients in the present study¹. Longer delay in diagnosis, average 11.15 months as found in the current study indicates poor IEC activities and or poor accessibility of MDT services. ^{10, 11} Delay diagnosed patients

present with higher rate of disability and it may be the reason for significantly higher rate of grade 2 disability in patient diagnosed after 12 months of onset of symptoms.

Deformities and disabilities are more commonly found among manual workers, since they are more frequently exposed to injuries and thus infection to leprosy¹. It may be true for Housewives as minor scratches and injuries are often neglected and /or not taken care of by these workers and housewives leading to disabilities.

Higher rate of ulcer in female may be due to inadequate care of anesthetic hands and feet by patient and /or lack of knowledge, awareness and health education regarding protection of anesthetic limbs from constant injury during cooking, washing and further household work, mostly neglected by females resulting in ulcer.¹²

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CONCLUSION

1. Prevalence of disability was found higher in study area than national average is of great concern.
2. Deformities found more among Manual Workers and Housewives. Awareness about Prevention Of Deformities (POD) to this Target group in Nagpur city was recommended as well a large-scale prospective epidemiological study to find out causes and progress of risk factors.
3. Disability bears stigmatizing psychological impact on patients and society, so early diagnosis within 12 months and prompt and adequate treatment will help to avert the visible deformities and hence social stigma in leprosy patients.
4. As longer delay in diagnosis indicates poor IEC activities and /or poor access to MDT

services, regular conduit of IEC in urban slum areas recommended.

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