



Original Research Article

Evaluation of impact of national leprosy eradication programme in a community health centre in Eastern India

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ARTICLE INFO

Article history:

Received 19-07-2020

Accepted 06-10-2020

Available online 29-12-2020

Keywords:

NLEP

MDT

LCDC

ABSTRACT

Background & Aim: Leprosy a chronic infectious public health challenge is caused by a slowly multiplying acid fast bacillus *Mycobacterium leprae*. An untreated leprosy-affected person is the only known source of infection. Our aim was to study the trend in the prevalence of leprosy in the health care facility, to compare the leprosy burden in urban and rural field practice area under the health facility, to identify any gaps/loopholes in the implementation of the NLEP and to recommend remedial measures to address the gaps.

Materials and Methods: A cross sectional study was conducted at Community Health Centre Jatni, Khordha, Odisha during the year 2018-19. A pre-designed questionnaire, personal interview with multi-purpose health worker male and review of leprosy records of different years was used as study tool.

Results: Majority i.e., 78.6% of the leprosy patients were from rural areas. Overall male predominance of the cases was found both in urban & rural areas. More numbers of cases were registered during 2014-15 & 2015-16 which was declined in 2016-17, but again increased in the subsequent years i.e., 2017-18 and 2018-19. 61.8% diagnosed leprosy cases had successfully undergone treatment and got cured and 24.4% of the cases were the defaulters to MDT.

Conclusion: Defaulter cases are the major source of continuous transmission of infection in the community. Active surveillance for Leprosy is to be strengthened in both rural and urban areas with special focus on IEC and BCC activities along with proper counseling of the family members with involvement of community people.

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1. Introduction

Leprosy is a chronic infectious public health challenge which is caused by a slowly multiplying acid fast bacillus, *Mycobacterium leprae*. An untreated leprosy-affected person is the only known source of infection.

The disease is well known for a long incubation period, which may range from few weeks to 30 years.¹ Leprosy; one of the neglected tropical diseases is generally associated with poverty, overcrowding, thereby affecting the most underserved population of the country. As far as the burden

of Leprosy is concerned, global prevalence of leprosy according to Global leprosy Update 2017 is 0.25 per 10,000 population (Total 1,92,713 cases); an increase of 20,765 cases as compared to 2016. The increase in cases was observed in all WHO regions and the highest prevalence was seen in SEAR, i.e. 0.6 per 10,000 populations. SEAR contributes about 73% of the global leprosy burden (India and Indonesia contribute 67.4% of new cases globally and 92.3% regionally).² As per WHO data more than 81% of the new cases are reported from three countries i.e., India, Brazil and Indonesia.^{3,4} Although the prevalence of leprosy in India is less than 1 per 10,000 since 2005, it still accounts for 62% of the total new cases reported worldwide.³

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In spite of the fact that the disease has long incubation period, the time taken for declaration of elimination after attainment of prevalence rate < 1 per 10,000, was too short, which is revealed by the continuous emergence of new cases along with a rise in cases amongst children in India from 2006 till date.^{1,5} Despite advances in all spheres of medical science, leprosy continues to be a public health challenge in countries like India.⁶ Leprosy is a silent emergency; the real burden of which is underestimated; affecting the most underserved population of the country.²

“National Leprosy Eradication Programme (NLEP) in India is a centrally sponsored health scheme of the Ministry of Health and FW, Government of India. The programme is also supported by WHO, ILEP, and few other Non-Governmental organizations (NGOs). Due to their efforts, from a prevalence rate of 57.8/10,000 in 1983, India has succeeded with the implementation of MDT in bringing the national prevalence down to “elimination as a public health problem” of less than 1 per 10,000 in December 2005 and even further down to 0.66/10,000 in 2016. India by the end of March 2011–2012 succeeded in achieving elimination at the state level in 34 out of the total of 36 states/UTs. Only the state of Chhattisgarh and the UT of Dadra & Nagar Haveli were yet to achieve elimination. By the end of March 2016, 82.36 % i.e. 551 out of the total 669 districts in India achieved the target of elimination; i.e., leprosy as a public health problem,⁷ which suggests that leprosy is still a major public health challenge in those districts which have leprosy prevalence of more than or equal to 1 per 10,000 population and they are a long way back from achieving the status of leprosy elimination; rather they contribute to continued transmission.

However at present, in spite of availability and implementation of an effective multi-drug therapy (MDT) for more than 30 years and attainment of status of leprosy elimination as defined by WHO in 2002, India still continues to have a high share of 58.8% of the world leprosy population.⁸ In the year 2007, new cases detected in India were 137,685, and nine years later in 2016, the number remained almost the same at 135,485, a significant increase over the 127,326 new cases detected in 2015. This increase in new cases is attributed by NLEP to their recent strategy of innovative Leprosy Case Detection Campaign (LCDC), which resulted in the detection of 34,000 new cases from highly endemic pockets and accounted 25% of the total annual new cases in 2016.⁷ Unfortunately, leprosy eradication from community appears as if had been equated with the reaching of the WHO-defined target of elimination of leprosy as a public health problem. However many districts have not yet reached the target of elimination. Rather the use of term “elimination” also creates confusion among the public and also to many even in the medical profession.⁸ Over two lakh new cases of leprosy are detected each year of which about 7% are associated with

grade-2 deformity by the time of diagnosis. Hence the disease elimination can be achieved with a wider focus on risk groups and their socio-demographic characteristics; as it is evidenced that elderly age, overcrowding, hunger, and poor SES etc, pose a greater risk for leprosy. Thereby special attention should be directed for improving the living conditions of the underserved population and decreasing inequality in low and middle-income countries so as to achieve leprosy elimination.⁹ Leprosy almost eliminated a decade ago; has been returned back in Odisha. The National Health Profile 2019 released by the Union Ministry of Health and FW says leprosy prevalence rate in Odisha is second highest in the country after Chhattisgarh. The Hansen’s disease is now prevalent in 18 districts of the state. From a prevalence of less than one per 10,000 populations in 2006, it now stands at 1.39 against the national average of 0.65. Six districts have recorded annual new case detection rate (ANCDR) of more than 50 per one lakh (i.e., >5 cases /10,000) population. According to NHP, as many as 8,754 new cases of leprosy have been detected in Odisha in 2018 and 6,445 persons are under MDT.¹⁰

2. Materials and Methods

A cross sectional study was conducted in community health centre, Jatni during the year 2018-19. The head quarter multi- purpose health worker (MPHW-M) of the CHC performing the duty of paramedical worker (PMW) leprosy, was interviewed using a pre-designed questionnaire to collect the data. Also secondary data were collected for a period of 5 years from 2014-15 till 2018-19 from the leprosy records available with him.

3. Results

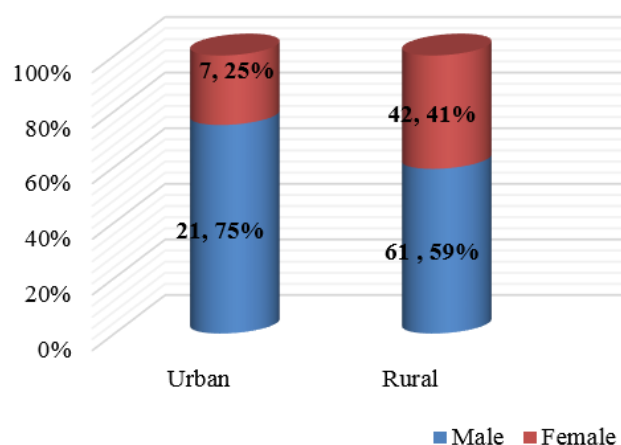


Fig. 1: Residence wise distribution of male & female leprosy cases

Table 1: Year wise comparative analysis of new PB Leprosy cases according to place of residence (Rural population-87958 & urban 57389).

Year	Adult PB cases				Total	Child PB cases (<15yrs)				Total
	Urban		Rural			Urban		Rural		
	M	F	M	F		Mch	Fch	Mch	Fch	
2014-15	1	0	8	5	14(29.8%)	1	0	1	0	2(25%)
2015-16	3	1	5	4	13(27.7%)	1	0	1	0	2(25%)
2016-17	0	0	2	0	2(4.2%)	0	0	0	1	1(12.5%)
2017-18	2	1	3	4	10(21.3%)	0	0	2	0	2(25%)
2018-19	2	2	0	4	8(17%)	0	0	0	1	1(12.5%)
Total	8	4	18	17	47	2	0	4	2	8 (100%)
	12(25.5%)		35(74.5%)		(100%)	2(25%)		6(75%)		

Total PB cases detected = 55

Table 2: Year wise comparative analysis of MB cases among the Urban & rural population

Year	Adult MB cases				Total	Child MB cases (<15yrs)				Total
	Urban		Rural			Urban		Rural		
	M	F	M	F		Mch	Fch	Mch	Fch	
2014-15	4	0	10	2	16 (24.2%)	1	1	0	2	4(40%)
2015-16	1	0	13	6	20(30.3%)	1	0	1	0	2(20%)
2016-17	1	0	3	5	9(13.6%)	0	0	0	1	1(10%)
2017-18	2	2	6	3	13(19.7%)	1	0	0	1	2(20%)
2018-19	0	0	5	3	8(12.1%)	0	0	1	0	1(10%)
Total	8	2 (3%)	37	19	66 100%	3	1	2	4	10 (100%)
	12.1%		56.1%			4(40%)		6(60%)		

Total MB cases detected =76

Table 3: Leprosy cases with deformity amongst Urban and Rural population. (All MB cases N=76)

S. No.	Year	Urban (total detected MB cases=14)		Rural (total detected MB cases=62)	
		Grade I	Grade II	Grade I	Grade II
1	2014-15	2	1	4	2
2	2015-16	0	0	3	3
3	2016-17	0	0	2	1
4	2017-18	1	0	1	0
5	2018-19	0	0	1	1
Total		3	1	11	7
		4 out of 14 (28.5%)		18 out of 62 (29%)	

Table 4: Comparative analysis of registered Leprosy cases (PB+ MB) and place of residence

MB cases Year	Urban		Rural		Total
	M	F	M	F	
2014-15	7	1	19	9	36 (27.5%)
2015-16	6	1	20	10	37 (28.2%)
2016-17	1	0	5	7	13 (9.9%)
2017-18	5	3	11	8	27 (20.6%)
2018-19	2	2	6	8	18 (13.7%)
Total	21	7	61	42	131 (100%)
	28 (21.4%)		103 (78.6%)		

Table 5: Outcome of the Leprosy Cases (Old and New):

Year wise	Diagnosed Cases (new + old)			Cured			Defaulters	Relapse	Non-traceable
	PB	MB	Total	PB	MB	Total			
2013-14	8	10	18	4	9	13	4	1	0
2014-15	14	16	30	5	7	12	8	6	4
2015-16	13	20	33	11	13	24	5	3	1
2016-17	2	9	11	1	5	6	4	0	1
2017-18	10	13	23	7	8	15	6	2	0
2018-19	8	8	16	6	5	11(68.7%)	5 (31.2%)	0	0
Total	55	76	131 100%	34	47	81 (61.8%)	32 (24.4%)	12 (9.1%)	6 (4.6%)

Table 6: Defaulter cases among Urban Vs rural population

	Urban						Rural					
	Diagnosed			Defaulted			Diagnosed			Defaulted		
	PB	MB	Total	PB	MB	Total	PB	MB	Total	PB	MB	Total
	14	14	28	5	4	9	41	62	103	10	13	23

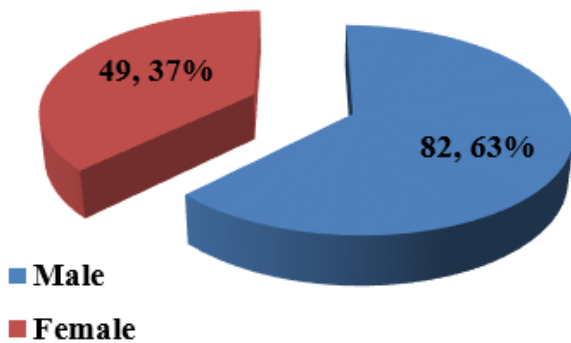


Fig. 2: Distribution of leprosy cases according to sex

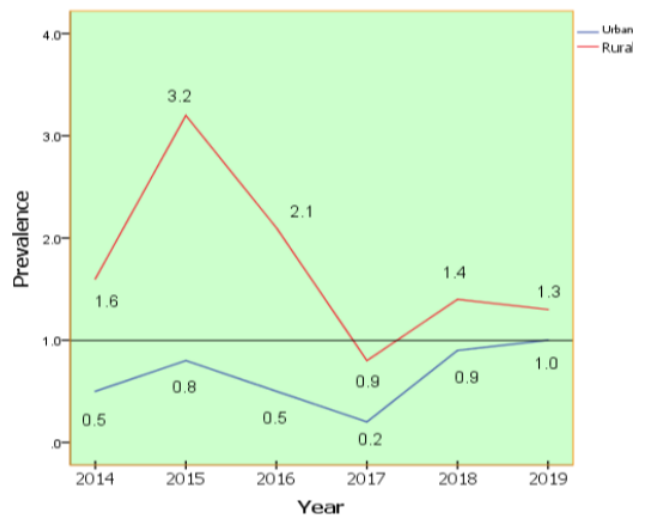


Fig. 4: Comparison of point prevalence of leprosy in rural and urban area.

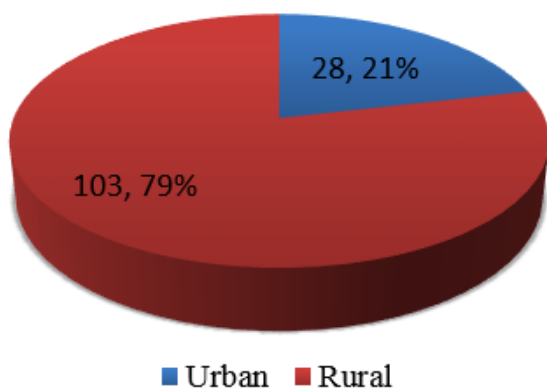


Fig. 3: Distribution of cases according to place of residence

4. Discussion

Table 1 depicts that a total of 47 pauci-bacillary (PB) adult Leprosy cases (age ≥ 15 years) have been detected over a period of 5 years, out of which majority of the cases i.e., 29.8% and 27.7% were registered in the year 2014-15 and 2015-16 respectively. Among the 47 adult PB cases, 26 were males 21 were females. Among the males, 8 belonged to urban area and 18 from rural villages. Similarly out of 21 females, only 4 were from urban & 17 from rural area. A total of 8 children were registered as PB (child) Leprosy over the above said study period and 6 out of 8 (75%) cases were from rural area.

As revealed from Table 2 a total of 66 adult MB cases were registered during this study period out of which 24.2% and 30.3% MB cases were registered during 2014-15 and

2015-16 respectively. Majority i.e., 45(68.2%) were males. 37 out of the 45 males were from rural places, only 8 were from urban areas. Similarly 2 among the 21 female cases were from urban area and the rest were from rural areas. So over all, 56 out of 66 (84.8%) adult cases were having residence in the rural areas, again showing rural predominance of the leprosy burden.

Similarly 6 out of the 10 (60%) MB leprosy children had residence in rural areas. From Tables 1 and 2 it was found that a total of 18 out of 131 leprosy cases i.e., about 14% of cases were children and majority of the affected children i.e., 66.6% (12 out of 18) were having residence in rural area.

So major focus should be directed towards the rural areas as well as the children affected with leprosy as it is well known that the proportion of child leprosy cases is an indicator of continued transmission of infection in the community while the percentage of patients with grade 2 deformity reflects a delay in the diagnosis. According to the available data of NLEP- progress report for the year 2014-15, Child cases which at present constitute about 9% of global and Indian new cases detected annually, showed no appreciable decline over the last decade. What is worrisome for India is that the proportion of new child cases detected was 12% or higher in eight states/union territories with Lakshadweep reporting as a proportion of child cases as high as 75%; with 245 new child cases presenting with grade 2 disabilities for the year 2014–2015.¹¹

In case of children i.e., under the age of 15 years old Leprosy is common in countries where leprosy continues to be endemic. As per the global data 2012; 21,349 new child cases(i.e.,9%of all the new leprosy cases)were detected; amongst which 76.5% belonged to South-East Asia region. In India, 10 states had proportion of child leprosy cases more than 10%, out of them in Daman and Diu it was 30%. Based on different study reports; much higher proportion of cases were found in active population surveys,i.e., 35% in Maharashtra and 32.5% in Agra.¹²

From Tables 1 and 2 it is found that Majority of the Leprosy cases i.e., (58%) 76 out of total 131 are of MB category which are also the major source of transmission of infection in the community. Similar results were found in a study conducted by Giri VC et al(2017); where 60.8% of cases were MB category and rest 39.2% were PB leprosy cases.¹³

Table 3 shows that, a total of 22 out of 76 MB (28.9%) cases were detected with grade-I & grade II deformity. Majority i.e., 18 out of 62(29%) cases were documented from rural area, out of which 7 cases were having visible deformity i.e., grade-II deformity. However only a single case with grade-II deformity was detected from urban area, showing delay in the diagnosis and treatment of the leprosy cases in rural area; may be because of social stigma for which special emphasis needs to be given over the rural

areas. In the study conducted by Giri VC et al(2017); it was found that a total of 6 out of 166 newly detected leprosy cases had either Gr-I or Gr-II deformity.¹³

Table 4 shows 28 out of total 131 Leprosy cases belonged to urban areas where as majority i.e., 103 (78.6%) cases were from rural areas. Overall male predominance of leprosy cases were found both in urban as well as in rural areas. More numbers of cases were registered during 2014-15 & 2015-16 which was declined in the subsequent year i.e., 2016-17, but again increased in 2017-18 and 2018-19 which may be due to more active case finding by door to door screening campaign by the grass root level workers like ASHA in leprosy case detection campaign (LCDC). However table Nos-2 & 4 showed that the number of new cases detected among the children age group was found to decrease in both PB & MB category Similar results were found in a study conducted by Mohite et al(2013) showed that the number of new cases of leprosy decreased from 543 to 95, the percentage of child cases among the new cases decreased from 44% to 4.7% due to effective implementation of NLEP services. However the proportion of MB cases among the new cases was increased from 17% to 32.6%.¹⁴

Figure 1 showed that proportionately higher numbers of male leprosy cases in the urban area were registered in comparison to that in rural area and the reverse was noticed for female cases.

Figure 2 depicts amongst the registered leprosy cases males were proportionately much higher in number which may be due to more exposure of the males to the infection sources.

Figure 3 shows about 80% cases were registered from the rural area, which indicates that more stringent screening campaigns & monitoring of the cases under treatment to be undertaken in the rural areas.

Figure 4 shows the comparative analysis of overall point Prevalence (by 31st March of respective years) of leprosy cases based on residence which is much higher in rural area in comparison to urban. Rural Prevalence was found above the target for elimination of leprosy except for the year 2017 which was 0.9/10,000 population. However a huge improvement in the prevalence of leprosy in rural area was noticed from 3.2/10,000 in 2015 to 0.9/10,000 over a period of only 2 years. Whereas there was little bit increase in the prevalence towards 2018 and 2019 which may be a result of increase new case detection which may be due to more active case finding LCDC. Whereas in the urban area though the prevalence was below the cutoff line, a gross increase was noticed in 2018 & in 2019 it exceeded the cutoff target for elimination. This may be due to gathering of hidden cases, more number of resistant patients or relapse cases due to defaulter to MDT.

From Table 5, it was found that 81 out of total 131(61.8%) diagnosed leprosy cases were successfully

undergone treatment and got cured. 34 out of 55 (61.8%) PB cases got cured from leprosy and 47 out of 76 (62%) MB cases also got cured. However a total of 32 under both PB & MB cases out of 131 (24.4%) cases were found to be defaulters to treatment. Incomplete treatment or defaulters to treatment are the major challenge for leprosy eradication since they are the continuous source of disease transmission in the community.

Table 6 shows that, (15 out of 32) i.e., 46.8% of the defaulters belong to PB category, rest 53.2% However proportion of Leprosy patients defaulted in PB category was found to be more in comparison to that of MB category i.e., 15 out of 55 (27.3%) diagnosed PB cases were defaulted from treatment whereas 17 out of 76 (22.4%) diagnosed MB cases were the defaulters. Similarly a higher proportion i.e., 32.1% (9 out of 28) of the defaulters was found amongst the urban patients in comparison to (22.3%) 23 out of 103 enrolled rural patients.

5. Conclusion

Majority of the cases (80%) were registered from the rural area, which indicates that more stringent screening campaigns & monitoring of the cases under treatment to be undertaken in rural area. Similarly percentage of children affected with leprosy indicates the continued transmission of infection in the community; hence major focus should be directed towards the children affected with leprosy. Defaulters to MDT are also the major source of continuous infection for the community. Hence more effective measures need to be taken for reduction of default rate. And strict adherence to MDT should be ensured through regular follow-up by the frontline workers as well as by the supervisory teams is of utmost importance to achieve the success. Active surveillance for Leprosy can be strengthened in above areas with special focus on IEC and BCC activities.

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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Cite this article: Panda M, Nanda S, Dhar RN. Evaluation of impact of national leprosy eradication programme in a community health centre in Eastern India. *Panacea J Med Sci* 2020;10(3):216-221.