

LEPROSY BEFORE AND AFTER NATIONAL ELIMINATION AT NEPAL MEDICAL COLLEGE TEACHING HOSPITAL: A 12 YEAR AUDIT

Joshi S, Jha AK, Shrestha S, Thapa DP

Department of Dermatology and Venereology, Nepal Medical College Teaching Hospital, Attarkhel, Gokarneshwor, Kathmandu, Nepal

ABSTRACT

Leprosy is a chronic infection caused by *Mycobacterium leprae*. Its elimination in Nepal was declared in 19th January, 2010. Though the prevalence rate of leprosy in Nepal has been maintained at below 1 per 10,000 population since the declaration of its elimination, high case detection rate and pockets of endemicity still exist. The objectives of this study were to determine and study the frequency, pattern and trends of leprosy in Outpatient Clinic of the Department of Dermatology and Venereology at Nepal Medical College Teaching Hospital before and after its national elimination. This was a descriptive, retrospective study carried out after reviewing the departmental records of leprosy patients attending the Department of Dermatology and Venereology at Nepal Medical College Teaching Hospital from January 2004 to December 2015. Two hundred twenty patients were registered in the Leprosy Register of the Dermatology Clinic during a period of 12 years. Hospital based frequencies before and after national elimination were 0.30% and 0.14% respectively. Mean age was similar in pre and post elimination categories (38.05±15.96 years vs. 38.59±18.98 years). Female proportion increased in the post-elimination category (Female proportion 30.51% before elimination vs. 35.29% after elimination). Children proportion showed a rise in the post-elimination period (7.62% before elimination vs. 12.74% after elimination). Percentage of multibacillary patients was similar in both groups (69.49% vs. 63.73%) and so was the presence of bacilli in slit skin smear and/or histopathological examination (11.86% vs. 11.76%). Percentage of patients developing reactions showed a rise in the post-elimination period (3.38% before elimination vs. 15.68% after elimination). Frequency of leprosy at Dermatology Clinic is on the decline. However, high proportion of multibacillary patients, rise in children proportion and rise in percentage of patients with leprosy reactions demands intensification of case detection strategies, continuation of training of health workers and infrastructure development for early diagnosis and management of leprosy and its complications.

KEYWORDS

Leprosy, Nepal, post-elimination

CORRESPONDING AUTHOR

Dr. Smita Joshi
Department of Dermatology and Venereology, Nepal Medical College Teaching Hospital, Attarkhel, Gokarneshwor, Kathmandu, Nepal;
E-mail: smitaz@gmail.com

INTRODUCTION

Leprosy is a chronic granulomatous disease caused by *Mycobacterium leprae* affecting predominantly skin and nerves.¹ Elimination of leprosy at national level was achieved in 2009 and subsequently declared in January 2010. Prevalence of leprosy in Nepal has been maintained at below 1 per 10,000 since the elimination was declared, but there is a steady increase in prevalence with the latest rate of 0.89 as of February 2017. Eighteen districts are yet to achieve elimination.² The present study was undertaken to assess the magnitude, profile and trends of leprosy at a tertiary level health center before and after national elimination.

MATERIALS AND METHODS

This was a retrospective, descriptive study done by analyzing the case records of patients registered in Leprosy Register of the Department of Dermatology and Venereology at Nepal Medical College Teaching Hospital (NMCTH), Gokarneshwor, Kathmandu. The hospital is a tertiary care center situated in northern

outskirts of Kathmandu valley and caters to patients from all over the country, especially from Kathmandu valley and the nearby districts of Sindhupalchowk, Nuwakot and Dhading. The data obtained from the register was studied with regard to age, gender, residence, WHO multi/ paucibacillary status, presence of reaction and presence of bacilli on Slit Skin Smear or histopathological examination. The data before and after national elimination were assessed. The study was approved by Institutional Review Committee.

RESULTS

A total of 220 patients were registered in the Leprosy Register at NMCTH during a period of 12 years (January 2004 to December 2015). Total OPD cases during the same period at the Department of Dermatology and Venereology was 110,105 resulting in the hospital based frequency of leprosy as 0.2% of total Dermatology OPD patients. Leprosy elimination was declared at national level on 19 January 2010. Thirty first December 2009 was taken as a cut off for segregating patients into pre and post elimination categories in this study. Various parameters studied during the audit are given in Table I.

Table 1: Parameters studied in the pre and post elimination categories

Particulars	Pre-elimination [n=118]	Post-elimination [n=102]
Frequency of leprosy (% of Dermatology OPD patients)	0.30%	0.14%
Mean Age $\pm$ SD (years)	38.05 $\pm$ 15.96	38.59 $\pm$ 18.98
Duration of symptoms (available)	86	63
$\leq$ 1 month	6	7
>1 month – 1 year	58	42
>1 year	22	14
Residence		
Within Kathmandu valley	54 (45.76%)	52 (50.98%)
Outside Kathmandu valley	64 (54.24%)	50 (49.02%)
Male	82	66
Female	36	36
Female proportion (%)	30.51%	35.29%
Children ($\leq$ 18 years)	9 (7.62%)	13 (12.74%)
Paucibacillary	36 (30.51%)	37 (36.27%)
Multibacillary	82 (69.49%)	65 (63.73%)
Reaction	4 (3.38%)	16 (15.68%)
Type 1 reaction	0	11
Type 2 reaction	4	5
Presence of bacilli (SSS and/or HPE)	14 (11.86%)	12 (11.76%)

Frequencies of leprosy before and after elimination at NMCTH were 0.30% and 0.14% respectively. Mean age in pre-elimination category was 38.05 $\pm$ 15.96 years and post-elimination category was 38.59 $\pm$ 18.98 years. Maximum number of patients belonged to 19 to 28 years age group in both the categories (Fig. 1).

Duration of symptoms was available in 86 and 63 patients in pre and post-elimination categories respectively and majority of patients had duration lasting for more than one month and less than 1 year in both groups (58 and 42). Percentage of patients coming from within Kathmandu valley was similar in both groups (45.76% vs. 50.98%). Increase in female

proportion was noted in post-elimination category. Children proportion showed a rise in the post-elimination period (7.62% vs. 12.74%). Percentage of multibacillary patients was similar in both groups (69.49% vs. 63.73%) and so was the presence of bacilli in Slit skin smear (SSS) and/or Histopathological examination (HPE) (11.86% vs. 11.76%). Percentage of patients developing reactions showed a rise in the post-elimination period (3.38% vs. 15.68%). Year-wise cases and frequency of leprosy at the Dermatology clinic is given in Table 2 and Fig. 2.

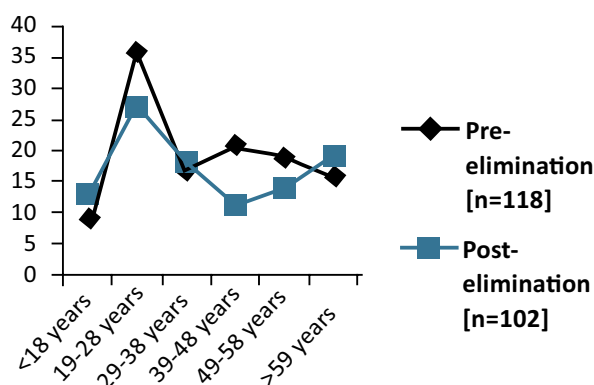


Fig. 1:
Age distribution

Table 2: Year-wise leprosy cases and frequency

Year	Total OPD cases	Leprosy cases	Frequency (%)
2004	4,610	12	0.26
2005	4,797	20	0.41
2006	4,511	11	0.24
2007	7,367	22	0.29
2008	8,599	22	0.25
2009	8,797	31	0.35
2010	9,147	31	0.33
2011	11,236	27	0.24
2012	11,339	10	0.08
2013	12,675	8	0.06
2014	14,041	18	0.12
2015	12,986	8	0.06
Total	110,105	220	0.20

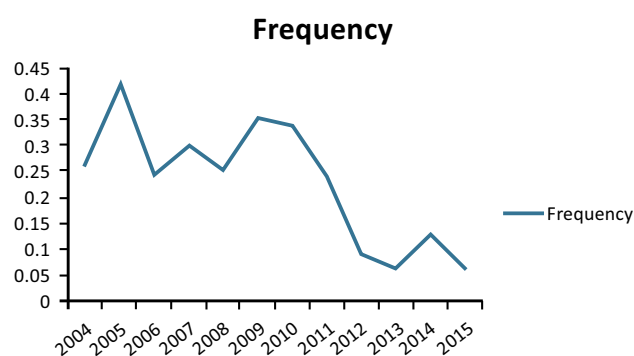


Fig. 2:
Year-wise frequency (% of Dermatology OPD patients)

Despite intermittent rise in reporting of leprosy cases, a general trend in decrease in frequency of leprosy at the clinic in NMCTH was observed.

DISCUSSION

The global prevalence of leprosy as of first quarter of 2015 is 0.29 per 10,000 population. South East Asia Region is considered the region with highest case detection rate (8.1/100,000 population), with total

new cases of 156,118 in the year 2014 contributing to nearly three fourth of the global burden. This high case detection rate is due to the contribution of high number of cases from India. Nepal ranks among top 14 countries contributing to 95% of global burden of leprosy.³ Though national elimination had been declared in January 2010, the sustenance of national elimination has required continuous effort on local and national level. Trends in new case detection rate (NCDR) per 100,000 population at national level post elimination has persisted at near constant level (Range – 10.67 in 2015/16 to 12.2 in 2011/12).² To a certain extent, this could be attributed to active case detection strategies undertaken by Leprosy Control Division. However, the fact that cases of leprosy still continue to present in clinics across the country, especially the multibacillary disease with high chances of transmission to the contacts cannot be denied. The present audit was thus undertaken with an aim to study the change in trend of leprosy cases at our clinic in NMCTH.

In the present study, the 6 year frequency of leprosy showed decline in the post-elimination period. Although new cases in the pre and post-elimination period were comparable, year-wise trend in frequency of leprosy showed gradual decline over the years. The NCDR in a study from Bangladesh also showed decline in the post-elimination period.⁴ Leprosy prevalence and case detection showed a steady decline in a 15 year post elimination study done in Cameroon. A considerable number of districts had however significant disease burden.⁵ In Nepal, NCDR has however remained around 11 per 100,000 population after elimination, the probable reason being contribution of cases from districts with high endemicity which have not yet been able to eliminate the disease locally.² Studies from India also showed continuation of high number of leprosy cases presenting in the post elimination period.⁶⁻⁸

The mean age in both categories was similar. Maximum number of patients belonged to 19-28 years age group in both the categories which is similar to that observed in a study by Bhattarai *et al*. With regard to the duration of illness before presentation, both the groups had maximum number of patients in 1 month to 1 year range. This is in contrast to the results in the study by Bhattarai *et al* where most patients presented with disease duration of 12 to 23 months.⁹

A difference in female proportion was observed with comparatively more females presenting in the post elimination period. This change, although small, is a positive result in terms of overcoming social stigma and barrier associated with leprosy at the community level. Female proportion in our study (35.29% post elimination) was similar compared to national statistics post elimination (Range - 28.4% in 2010/11 to 38.28% in 2015/16).²

Child proportion in our study (12.74%) is higher compared to the data obtained from national report in the post elimination period (Range - 4.24% in 2012/13 to 7.73% in 2014/15).² This could be due

to higher age limit (≥ 18 years) taken in the study. Studies on childhood leprosy from India showed slight decline to near constant child proportion through post-elimination era.^{7,10} Rise in Children ratio in the post-elimination period in our study denotes ongoing transmission and a need to intensify measures for early diagnosis, treatment and prevention of transmission.

Percentage of multibacillary disease in our study was high compared to national average of around 50% for the last several years.² Similar finding of high multibacillary disease in post elimination period was noted by Mowla et al in Bangladesh and Chhabra et al in India.^{4,11} Although the percentage of multibacillary disease was similar in both groups, the fact that majority of patients still present with multibacillary leprosy necessitates continuation and strengthening of leprosy control activities. A rise in patients presenting with reactions in the post-elimination period requires health workers and referral centres well-equipped in management of reactions so as to prevent deformities and disabilities. Percentage of multibacillary patients and those with reactions in post-elimination category were less as compared to the study done in Dharan (63.73% vs. 92.2% and 15.68% vs. 76.3% respectively).⁹

Looking at the national trends, the NCDR has remained almost constant over the years. The prediction of having increased number of new leprosy cases in post elimination period might as well come true.¹² However, though the number of cases in our study is less, similar trend has not been observed in our study. Nevertheless, higher number of cases still presenting with multibacillary disease and the rise in the patients with Lepra reaction presents an ongoing challenge. Persistently high multibacillary proportion and children proportion necessitates aggressive steps to halt disease transmission by routine education and examination of every identified contact.¹³ The chances of contracting leprosy from neighborhood is four times and from family members is nine times than that from general population.¹⁴ However, active

case detection by Leprosy Control Division conducted by performing special contact examination in 2015 detected more new cases in the community than in the family. This suggests that timely diagnosis and treatment of those with disease and contact examination of family members is less than sufficient if we are to achieve the unmet national target of reducing NCDR by 25% and prevalence rate by 35% by the end of 2015 as compared to 2010 by next few years.¹⁵

Despite national elimination, dermatologists and health care providers should remain vigilant about the possibility of leprosy patients presenting at their health centers. The role of dermatologists in diagnosis of atypical cases and management of difficult cases especially reactions, policy makers in continuing capacity building of health care workers, allocation of budget and promoting active case finding, and teaching institutions in training of new workforce is paramount in continuing the battle against leprosy.¹⁶⁻¹⁸ Furthermore, time has come to formulate alternate and sustainable source of drug supply for patients when World Health Organization and Novartis will wind up and withdraw the support they have been providing globally. While the global community and international organizations are more focused on other trending illnesses like non-communicable diseases, it is upon us to continue and reinforce the efforts to diagnose the cases at the earliest, provide the treatment in the most effective manner and prevent disease transmission and long term complications.

The study was conducted in a single tertiary center, hence, the results cannot be generalized. As the study was conducted by reviewing data from Leprosy Register at the Dermatology Clinic, missing data could not be avoided. Less number of patients with reactions in our study could be attributed to this. Similarly, data regarding nerve involvement, deformities and disabilities were inadequate to make fruitful conclusions and hence were not included in the study.

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