

# Implementation of Active Case Detection of Visceral Leishmaniasis along with Leprosy through Female Community Health Volunteers in Sarlahi District, Nepal

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## ABSTRACT

### Background

Visceral leishmaniasis (VL) and leprosy are important public health problem in Nepal. Female Community Health Volunteers (FCHVs) play pivotal role to promote community based health services. Therefore, we designed an implementation research to assess the effectiveness of active case detection (ACD) and information education and communication (IEC) campaign of Visceral leishmaniasis cases along with leprosy cases through Female Community Health Volunteers in Visceral leishmaniasis endemic 10 Village Development Committees of both Visceral leishmaniasis and leprosy prevalent Sarlahi district of Nepal.

### Objective

To determine the effectiveness of active case search strategy of visceral leishmaniasis along with leprosy through Female Community Health Volunteers in Sarlahi district.

### Method

One hundred fifty one Female Community Health Volunteers of twelve Village Development Committees were oriented on detection, identification and referral of Visceral leishmaniasis and leprosy patients. They were oriented on referring the patients to district hospital for confirmatory diagnosis and treatment. The intervention was continued up to ten months after training of Female Community Health Volunteers. Data on number of Visceral leishmaniasis and leprosy patients detected and referred by Female Community Health Volunteers and detected through passively at district hospital were collected and indicators was calculated.

### Result

Altogether 151 Female Community Health Volunteers were trained from 12 (Village Development Committees) VDCs of Sarlahi district. Their knowledge on leprosy and Visceral leishmaniasis related information subsequently increased after training. None of the Visceral leishmaniasis or leprosy cases were detected actively through Female Community Health Volunteers. However, two leprosy cases were detected through household screening.

### Conclusion

Female Community Health Volunteers should be provided sufficient knowledge to use them in community based active case detection of Visceral leishmaniasis and leprosy.

## KEY WORDS

*Active case detection, Female community health volunteers, Information education and communication campaign, Leprosy, Visceral leishmaniasis.*

## INTRODUCTION

Visceral leishmaniasis (VL) and leprosy are public health problem in Nepal. Leprosy was declared eliminated from Nepal in 2009; however, 14 districts still have high incidence. The multinational VL elimination programme aims at the early identification of disease through effective disease surveillance and treatment.<sup>1-4</sup>

Nepal reported downward trends of VL from 2013 with incidence below 1 per 10,000. VL cases in recent years have been reported from new foci.<sup>5,6</sup> The VL surveillance through passive case detection (PCD) includes only those cases that seek treatment by themselves.<sup>7</sup> Active case detection in the endemic areas is essential to find out the unreported VL cases and for appropriate intervention measures.<sup>8-10</sup> Although new case detection activities in cluster area of leprosy endemic districts have been proposed by the Government, it is not in action.<sup>4</sup>

Government of Nepal initiated the Female Community Health Volunteer (FCHV) programme in FY 2045/2046 in 27 districts and expanded to all 75 districts of the country in a phase wise manner.<sup>4</sup> They are provided 18 days basic training in two phases on selected primary health care components. The major role of the FCHVs is to promote health, safe motherhood, child health, family planning and other community based health services with the support of health personnel from the HPs, and PHCCs.

We designed an implementation research to assess the effectiveness of ACD and IEC campaign of VL cases along with leprosy through FCHVs in Sarlahi district of Nepal.

## METHODS

This was an intervention study to determine the effectiveness of VL and leprosy active case detection and case management. Both qualitative and quantitative research approaches were used to assess the performance of FCHVs for ACD case search. The comparison was done with the number of passively detected cases from those intervened (Village Development Committees) VDCs. The interventions to be analyzed were implemented by research team through existing FCHVs of VL endemic VDCs. The performance and results of ACD as well as of people's health seeking behavior was evaluated by the research teams in VL endemic target VDCs of Sarlahi district. IEC campaign was also organized through FCHVs.

The district with relatively high incidence of VL and leprosy was selected to implement the combined active case detection strategy. Sarlahi district of Central terai of Nepal had incidence of VL 0.66 per 10,000 populations in 2013 and incidence of leprosy was 2 per 10,000 populations. Sarlahi district was one among 14 districts with leprosy incidence above 1 per 10,000 populations. In the district, ten VDCs reporting higher number of VL and clustering with leprosy cases in 2013 was selected in consultation with District Public Health Office Sarlahi.

All forms of VL and leprosy cases was identified and included in the study. The case search strategy was implemented through FCHVs in their respective working population.

This research was approved by Nepal Health Research Council and written informed consent was obtained from the study participants

The population of twelve VDCs reporting higher number of VL and leprosy cases will be covered during one year period of implementation of ACD. All population of selected VDCs is being covered during the active case detection strategy.

This intervention study was implemented in close co-ordination with Epidemiology and Disease Control Division (EDCD) and Leprosy Control Division, Department of Health Services. In addition, co-ordination was established with District Public Health Office Sarlahi and local health facilities health posts and primary health care centers to make them feel ownership of the intervention. FCHVs training on VL and leprosy case search were conducted at health posts and primary health care centers of respective VDCs by researchers and central and district level programme managers during first quarter of 2016.

Epidemiology and Disease Control Division had implemented ACD in VL endemic districts. Traditional index case approach, and camp approach had been implemented; however, incentive based approach of ACD implemented through FCHVs had not been tested and implemented for the case detection. Since the cases of VL was sharply decreasing in Nepal after effective implementation of VL elimination programme, it was essential to have cost effective and sustainable case detection methods for VL to sustain/maintain the progress achieved so far. We trained/oriented 151 FCHVs of 12 VDCs, who were permanent resident health volunteers of community, to actively search for VL cases along with leprosy cases. The active search was continued by FCHVs for 10 months after orientation training. The research team conducted refresher orientation to the FCHV in between and planned activities in respective areas were implemented and outcome was documented. Based on the number of VL/Leprosy cases referred, FCHVs were provided allocated incentive by the project. The referred cases were confirmed of VL and leprosy at district hospital Sarlahi.

One day training was provided for FCHVs before starting intervention. FCHVs were trained on their roles in ACD on detection of VL and leprosy cases and referral mechanism. The training covered differential signs and symptoms of VL and leprosy. The materials developed by the research team and experts from the Ministry of Health including pictorial with pictures (photos) were used for the training.

An incentive was offered by the research team as per Kala-azar Elimination Programme Guidelines both for the VL patient as well as for the FCHV who participated in active case detection.

FCHVs were observed as well as interviewed to assess the quality of ACD and conduct of the search activities as per guidelines and protocols. This was done through direct observation and analysis of the forms filled by FCHVs. Formats were developed to be used by FCHVs for case detection, and referral. This allowed categorizing the quality of ACD as adequate/inadequate/not done. FCHVs were interviewed at the end of the study period with a standardized questionnaire soliciting opinions/experiences about active case detection.

Data were entered into the computer using Epi Info 3.3.5. Descriptive statistics was generated. Difference between means was compared by parametric and non-parametric methods depending on the distribution of the variables. Differences between proportions were compared by Chi-square test. SPSS version 21 was used for data analysis.

Input indicators included number of FCHVs oriented on ACD, number of days utilized for ACD, number of households and population covered, etc.

Outcome measures include yield of newly detected VL and leprosy cases by ACD compared with cases detected/ reported by passive surveillance.

- Average number of new cases detected per FCHV;
- Proportion of new VL and leprosy cases detected by ACD as fraction of all diagnosed cases within past 12 months.

The outcome was measured through patient delay in both actively detected cases and passively detected cases interviewed at district hospital.

The cost analysis include costs of training, transport, IEC materials, staff cost, and other supplies. The operational costs of ACD determined and "cost effectiveness" (cost per new case detected) of the ACD implemented through FCHVs was evaluated.

## RESULTS

Altogether 151 Female Community Health Volunteers (FCHVs) were trained in the program. They were selected from 12 VDCs of Sarlahi district with reports of VL and leprosy cases in the past three years. Fifty three health workers of the 12 different health posts of the respective VDCs of Sarlahi district also participated in the training program (Table 1).

Majority of the trained FCHVs were above 30 years of age and were illiterate, but with above 10 years of working experience. One hundred and seven FCHVs (70.9%) out of 151 participated in the training had previously received training on visceral leishmaniasis. About 70% of the FCHVs had already received training on leprosy (Table2).

The correct knowledge on mode of transmission of visceral leishmaniasis due to sandfly bite was significantly increased in post-test (83.4%) as compared to pre-test

**Table 1. Health workers and FCHVs participated in the training**

VDC	Number of FCHVs	Number of Health Workers
Aurahi	14	5
Bhadsar	10	3
Dumariya	13	5
Hariwan	26	8
Ishwarpur	20	9
Kaudena	14	1
Khutauna	10	4
Madhubani	6	1
Mohanpur	11	3
Naikalwa	10	5
Netragunj	13	5
Salempur	14	4
<b>Total</b>	<b>151</b>	<b>53</b>

**Table 2. Background characteristics of trained FCHVs**

Characteristics	Number	Percent
<b>Age (years)</b>		
≤20	1	0.7
21-30	16	10.6
31-40	43	28.5
41-50	45	29.8
>50	46	30.5
<b>Educational qualification</b>		
Illiterate	48	31.8
Literate	33	21.9
Primary (1-8 class)	30	19.9
Secondary (9-12 class)	39	25.8
Bachelor and above	1	0.7
<b>Experience as FCHVs (years)</b>		
Less than 3	8	5.3
3-5	13	8.6
6-10	27	17.9
More than 10	100	66.2
No response	3	2.0
Received training on VL	107	70.9
Received training on Leprosy	104	68.9

(52.3%). Most of the FCHVs were aware about the signs and symptoms of VL which was more intensified after the training. District and the above level hospitals are the treatment place for VL as mentioned by FCHVs in pre-test and post-test. About 84% FCHVs before the training knew that VL treatment is free of cost. After the training it was increased to 94.7%. Although only 40.4% FCHVs knew that VL patient receive transportation cost in pre-test, 74.8% FCHVs became aware of it after the training. Environmental management (86.1%), use of bednets (68.9%), IRS (58.3%) were mentioned by most of FCHVs in post-test. About 40.4% of FCHVs had encountered VL in their community,

whereas, only 21.2% of them had referred the patient. FCHVs had good command on the signs and symptoms of leprosy which was much more strengthened through the training. Nepal Government has provided treatment of leprosy up to the health post level including the primary health care center but very few FCHVs were aware of it. FCHVs conferred good understanding that the treatment of leprosy is free of cost (Table 3).

**Table 3.** FCHVs Knowledge on VL and Leprosy related information's.

Particulars	Pre-test (n=151)	Post-test (n=151)	
<b>FCHVs knowledge on mode of transmission of VL</b>	Sandfly bite	79 (52.3)	126 (83.4)
	Vector bite	1 (0.7)	4 (2.6)
	Mosquito bite	55 (36.4)	15 (9.9)
	Others	2 (1.3)	0 (0.0)
	Do not know	14 (9.3)	6 (3.9)
<b>Knowledge on signs and symptoms of visceral leishmaniasis</b>	Fever more than two weeks	113 (74.8)	131 (86.8)
	Weight loss	91 (60.3)	106 (70.2)
	No appetite	103 (68.2)	107 (70.9)
	Uneasiness in left side abdomen	78 (51.6)	94 (62.3)
	Blackening of skin	85 (56.3)	104 (68.8)
	Swelling of abdomen	80 (52.9)	99 (65.5)
	Lack of blood in body	73 (48.3)	94 (62.3)
	Dry body	56 (37.1)	81 (53.6)
	Headache	1 (0.7)	0 (0.0)
	No response	41 (27.2)	21 (13.9)
<b>Place for treatment of VL</b>	District and above level hospital	110 (72.8)	132 (87.4)
	Primary health care center	6 (3.9)	4 (2.6)
	Health post	22 (14.5)	11 (7.3)
<b>VL treatment related information</b>	No response	13 (8.6)	4 (2.6)
	Know that VL treatment is free of cost	127 (84.1)	143 (94.7)
	Know that VL patient receive transportation cost	61 (40.4)	113 (74.8)
<b>Awareness on VL prevention</b>	Patient receive Rs 1000 for transportation cost	28 (18.5)	91 (60.3)
	Clean environment	107 (70.9)	130 (86.1)
	Wear body covering cloths	74 (49.0)	82 (54.3)
	Use of bednet	123 (81.5)	104 (68.9)
	Plaster the cracks of the walls of the houses	67 (44.4)	88 (58.3)
<b>FCHVs involvement in detection and referring VL patient</b>	Indoor residual spraying (IRS)	66 (43.7)	88 (58.3)
	Seen VL patient in the community	61 (40.4)	61 (40.4)
	Referred VL patient	32 (21.2)	32 (21.2)

<b>Knowledge on signs and symptoms of leprosy</b>	Presence of patches on skin without sensation	113 (74.8)	125 (82.8)
	Shivering of hands and legs	87 (57.6)	97 (64.2)
	Swelled nerves	75 (49.7)	98 (64.9)
<b>Place for treatment of Leprosy</b>	Hospital	109 (72.2)	110 (72.8)
	Primary health care center	4 (2.6)	7 (4.6)
	Health post	13 (8.6)	22 (14.6)
<b>Leprosy treatment related information</b>	Know that leprosy treatment is free of cost	123(81.5)	138(91.4)
	Seen leprosy patient in community	93(61.6)	-
	Referred leprosy patient	62(41.4)	-

Ten VDCs were screened for the febrile illness and skin lesion cases (Table 4).

**Table 4.** Number of households and population screened in the household survey in the incentive approach area

VDC	Number of households screened	Number of population screened
Aurahi	1245	8038
Bharsar	678	4570
Dumariya	803	5478
Ishwarpur	5567	28997
Kaudena	1378	8394
Khutauna	780	5771
Madhubani	699	5607
Mohanpur	1057	7961
Nokailwa	2195	14201
Salempur	1181	8016
<b>Total</b>	<b>15583</b>	<b>97032</b>

Two hundred cases were screened out of which two cases were Leprosy confirmed (Table 5).

The FCHVs did not refer any VL, PKDL and Leprosy cases.

## DISCUSSION

Twelve VDCs were selected for the FCHV training program on the basis of previous leprosy and visceral leishmaniasis data of the district. All the FCHVs and health workers of the respective health posts of the 12 VDCs were provided training. To increase the participation of FCHVs in the training, the FCHVs were provided incentive. The background characteristics of FCHVs revealed that majority of them were aged above 30 years, were illiterate and worked above 10 years as FCHV.

Above 70% of the FCHVs had already received training on VL and leprosy. FCHVs were asked for a number of questions

**Table 5. Characteristics of screened population in incentive area.**

Particulars		Number (Percent)
Gender	Male	49834 (51.4)
	Female	47198 (48.6)
Age distribution (years)	<1	2864 (3.0)
	1-5	12262 (12.6)
	6-15	22682 (23.4)
	16-45	40890 (42.1)
	46-60	13557 (14.0)
	>60	4777 (4.9)
Febrile illness and skin lesions patients in the community identified during household survey	Number of people with fever more than 15 days	50
	Number of people with skin lesions	150
	Number of KA positive cases among fever cases	-
	Number of PKDL cases among skin lesion cases	-
	Number of leprosy cases among skin lesion cases	2

including mode of transmission, sign and symptoms, place for treatment, treatment related information and prevention of VL and leprosy. All these questions were asked prior to training (Pre-test) and after training (Post-test). The response rate of FCHVs increased significantly after the training. Few FCHVs still were unable to respond after the training. Some of the FCHVs confirmed that they have seen VL and leprosy cases in their community and few of them also confirmed that they have referred the suspected cases to higher centers.

The FCHVs were advised to utilize their training expertise in detecting the VL and Leprosy cases from their community (Active case detection) and referring them to referring them to the district public health office for the confirmation of the cases for the 6 months period. Between this period none of the FCHV referred any VL or leprosy cases. As far as treatment and referring is concerned, FCHVs identified the

childhood pneumonia and provided oral antibiotics, while in childhood diarrhea; they provided zinc tablets and oral rehydration solutions.<sup>11</sup> However, FCHVs in this study were completely unable to screen any VL and leprosy patients.

For the confirmation of the FCHVs work and to evaluate the effectiveness of training, each household of the respective VDCs were screened after six months of the training for VL and leprosy cases through research assistants. Fifty febrile cases (VL suspects) and 150 cases with skin lesions (leprosy suspects) were screened during household survey. None of the febrile cases was confirmed VL positive whereas 2 cases with skin lesion was confirmed leprosy positive.

The district public health office data revealed 2 positive cases of VL and 36 leprosy positive cases during the same period. The FCHVs were unable to screen and refer any VL or leprosy cases. Two out of 36 leprosy positive cases were screened during household screening. Majority of the leprosy cases were not screened by the FCHVs and were also not detected through household screening.

The inability conferred to screen the leprosy cases was due to the social stigma. People with leprosy used to hide their disease because they feel ashamed and they always have the fear that if they got identified then they will be discriminated from the society. The social stigma is more pronounced in illiterate, old age people and those with improper knowledge on leprosy.<sup>12-14</sup>

## CONCLUSION

VL and Leprosy were not detected by FCHVs. Therefore, FCHVs with basic education level and those are active should be provided sufficient knowledge to use them in community based active case detection of VL and leprosy. For the successful detection of leprosy cases, campaigns for the removal of social stigma must be launched such that the leprosy cases could feel easy to talk over their problems and especially those with visible deformities and ulcers which remain house-ridden.

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