

## ORIGINAL ARTICLE

**Lymphatic filariasis in migrant population in non-endemic states - Need to cover by Mass Drug Administration (MDA)**Kailash Chandra Verma<sup>1</sup>, Tanvir Kaur Sidhu<sup>2</sup>, Avtar Singh Bansal<sup>3</sup>, Dhruvendra Lal<sup>4</sup><sup>1</sup> Commanding Officer, 48 FHO, Military Hospital, Bathinda; <sup>2,3</sup> Professor, <sup>4</sup> Post Graduate Student, Department of Community Medicine, Adesh Institute of Medical Sciences and Research, Bathinda, Punjab, India

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**Background:** Lymphatic filariasis (LF) is targeted by WHO for global elimination as a public health problem by year 2020. GoI is signatory to WHO resolution and envisaged elimination by instituting annual mass drug administration (MDA) in all endemic districts under NVBDCP by year 2015. With rapid industrialization and urbanization, large number of landless farmer, unskilled/skilled labour migrate either singly or with entire family members to other states (which may be non-endemic for LF) in search of employment. These migrants from endemic states escape MDA being migrated to non-endemic states. **Aims and Objectives:** To find out prevalence of LF and MF density among migrant staying in non-endemic states and assess needs to institute MDA in such migrants. **Material & Methods:** This study was a cross sectional epidemiological study carried out in migrant population staying at/near the construction site covering the population of 1640. However, only 1092 person participated in the study. **Result:** A total of 1092 people agreed to participate in the study, out of which, 22 were found MF positive and 4 presented with clinical signs of LF. The study found MF prevalence of 2.01% with average MF density of 3.90. **Conclusion:** Endemicity (2.01%) of MF among migratory population more than national average (0.45%), which is capable of continuing transmission (>1%) in population at risk living in non-endemic states where MDA is not administered.

**Key Words**

Lymphatic filariasis; microfilaria; migrant people; endemic and non-endemic state

**Introduction**

Lymphatic filariasis (LF) a debilitating disease is one of the most prevalent and yet one of the most neglected tropical diseases with serious economic and social consequences (1) LF is a vector-borne parasitic disease that is endemic in many tropical and subtropical countries. The current estimate reveals that 120 million people in 83 countries of the world are infected with lymphatic filarial parasites, and more than 1.1 billion (20% of the world's population) are at risk of acquiring infection. It is one of the

world's leading causes of permanent and long term disability.

Over 40 million people are severely disfigured and disabled by filariasis and 76 million are apparently normal but have hidden internal damage to lymphatic and renal systems.(2) In 1977, the 50<sup>th</sup> World Health Assembly (WHA) resolved that LF should be eliminated as a public health problem by the year 2020. The Global Programme to Eliminate Lymphatic filariasis (GPELF) has been one of the most rapidly expanding global health programme in the history of the public health. GPELF was launched in

2000 with the goal to eliminate LF as a public health problem by 2020.(3)

About 63% of the global population requiring mass drug administration (MDA) for LF lives in South-East Asia region where there are nine endemic countries. India accounts for 69.4% of the total population requiring MDA in the region. (4)

In India, LF is endemic in 250 districts in 20 states and UTs. The population of about 600 millions in these districts is at risk of LF.(5) The strategy of LF elimination is through annual MDA of single dose of Diethyl Carbamazine citrate (DEC) + Albendazole for a minimum 5 rounds or more to the eligible population (except pregnant women, children <2 years and seriously ill person) to interrupt transmission of infection.(6)

In the State of Punjab sizeable number of migrants come from nearby states like UP (0.24 million), Bihar (0.14 million) and Haryana (0.11 million).(7) Many of these migrants are from the states which are endemic for LF. Migration to non-endemic states deprives them from MDA administered in endemic states for control of LF under NVBDC programme. These migrant persons from endemic states if having infection of lymphatic filariasis in incubating, subclinical or in asymptomatic stage, in absence of treatment act as a reservoir and have potential of transmission of infection in non-endemic states. Several epidemiological and prevalence studies have been done by various researchers in endemic states on filariasis. However, studies have not been done for prevalence of filariasis in migrant population living in clusters on temporary basis in non-endemic states.

### Aims & Objectives

To assess prevalence of lymphatic filariasis among migrant people living on/near construction projects in non- endemic states

### Material and Methods

This cross sectional epidemiological study was carried out in migrant population staying at/near the construction site outskirts of Bathinda town in Punjab covering the population of 1640. However, only 1092 person participated in the study.

### Results

1640 (1384 males and 256 females) people were staying on/near construction projects. However, only 1092 (66.58%) agreed to participate in the study out of which 922(84.43%) were males and 170

(15.57%) females. Five participants, all males, were found having filariasis on clinical examination, whereas 22 (21 males and 1 females) were found microfilaria (mf) positive on blood slide. None of these mf positive people showed clinical features of filariasis.

The study population belonged to nine states (Six endemic and three non-endemic states) and two persons were from Nepal. The state wise distribution of study population shown in (Table 1)

The socio-demographic profile of study population and mf positive person shown in (Table 2)

#### Note –

- 41 children below 10 years and 37 children 10-20 years of age who were not doing any work and were excluded in trade wise distribution.
- Balance of 195 children of 10-20 years of age though not formally employed but helping their parents on worksite hence considered as unskilled worker.
- Out of 41 children below 10 years, 17 were below 6 years and excluded in education wise distribution.
- Balance 24 children of 06-10 yrs (school going children) were not attended any formal school nor attending at present location hence considered illiterate in study. (Table 3)
- Out of 1092 participants, 1062 (97.25%) belonged to the states endemic for LF. Their proportion ranged from 41.21%(Bihar),17.40%(UP),16.85%(MP) to 0.37% (Chhattisgarh) (Table 1). The age profile of study population varied from 06 months to 54 years with mean age of 29.34 years. Majority of study population (69.14%) was young below 30 years old, illiterate or of primary standard (80.97 %) and semiskilled/ unskilled (98.35%).22 (2.01%) people (21 males, 1females) were mf positive (prevalence of 2.01 percent). (Table 4) The five people were found to have clinical signs of LF and none of the clinically diagnosed LF were mf positive. The youngest person of mf positive was of 06 months and eldest of 47 years with average age of 27 years. 86.36% mf positive cases were aged below 30 years. All mf positive persons were unskilled, semiskilled/skilled. The prevalence of mf positive among illiterate and primary educated cases was 03.04% and 2.11% respectively.

Information about intake of drugs administered under MDA in their native place was also enquired.

887(81.24%) did not receive medicine administered under MDA in last five years while only 12 (1.09%) received medicine thrice or more in last five years. (Table 5)

## Discussion

WHO has targeted lymphatic filariasis global elimination and Global Programme to Eliminate Lymphatic Filariasis (GPELF) was launched in year 2000 with the goal to eliminate LF as a public health problem by year 2020. The main strategy of GPELF is to interrupt transmission of LF by annual single dose of DEC/Ivermectin plus Albendazole to entire eligible population living in area where the disease is endemic (area where microfilarimiasis or antigenemia is >1%). WHO recommends MDA for five years or more to reduce number of mf in the blood to the level (mf prevalence <1%) that prevents mosquito vectors from transmitting infection.<sup>8</sup> In India, MDA was started in year 2004 and then extended to all endemic states in year 2006 with annual single dose of DEC plus Albendazole. The success of elimination of LF mainly depends on the desired coverage of population ( $\geq 65\%$ ) by MDA for five years or mf prevalence level is brought down to less than 0.1%.

Out of 250 endemic districts, 186 districts were with mf rate less than 1%. Coverage of MDA in India was reported to be 74.93% in 2011. At national level, the mf rate which was 1.24% in 2004 brought down to 0.41% in 2010.<sup>9</sup> The state of Bihar has highest rate of endemicity (>17%) followed by Kerala (15.70%) and Uttar Pradesh (14.60%). Goa has showed the lowest endemicity of <1 percent.<sup>(10)</sup>

The coverage of MDA in endemic states reported by several studies across India ranged from 32.7% to 76.2%.<sup>(11,12,13)</sup> In our study population, 81.24% people did not receive MDA in the last five years. This low coverage of MDA is either attributed to lack of reach of services of the programme or migration of people to other states (non-endemic) in search of work where MDA is not administered. Sukhvair Singh *et al* and Ashok Mishra *et al* found prevalence of mf in endemic states ranged from 0.93% to 8.85% with mf density in the range of 3.1 percent to 10.6 percent.<sup>14,15</sup> The prevalence of mf in friendly neighbor country Nepal, in many studies ranged from 25.1% to 5.8%.<sup>(16,17,18)</sup> The movement of people between Nepal and India could play role in persistence and transmission of the infection.

The prevalence of mf and mf density in our study was 2.01%. The number of mf per slide varied from 1 to

21 with average mf density of 3.90. The mf prevalence in our study was much less than found in other studies carried out in endemic states but higher than national prevalence of mf (0.45%). This could be because this study was undertaken among people living in non-endemic state in limited geographical area. But this low prevalence of mf and mf density found in our study population is enough to sustain development of infective larvae in mosquito after biting these low density carriers in population and continue to maintain infection in the non-endemic states. S Sabesan, Konganti Hari K Raju *et al* in their study also assessed risk of transmission in some districts in non-endemic states (Harayana, Punjab and Uttarakhand) and recommended for MDA after conduct of epidemiological survey.<sup>(19)</sup>

## Conclusion

The higher endemicity (2.01%) of mf among migratory population than national average (0.45%) and the level which is capable of continuing transmission (>1%) in population at risk living in non-endemic states where MDA is not administered under national programme would have higher probability to spread the infection to general population provided all other epidemiological and ecological criteria being met.

The migration of people from endemic to non-endemic states, uncontrolled urbanization, inadequate and substandard sanitary facilities and living conditions and population having infection in non-endemic states requires specific targeted approach to achieve national and global target of elimination of LF by year 2020.

Based on the results of the study, it is recommended that migratory population living in groups near construction projects, brick kilns, and industries in temporary settlements on outskirts or within cities in under developed areas located in non-endemic states should be covered by transmission assessment survey (TAS) followed by treatment. If the mf prevalence among these migrant populations found more than >1 percent, then these people should be administered two drugs (DEC+Albendazole) on annual basis as administered under NVBDC programme till they stay in non-endemic states (4-5 years).

## Recommendation

Migrant population from filaria endemic states staying in clusters in non-endemic should be subjected to annual transmission survey to assess

prevalence of microfilaria and MDA if prevalence found > 1%.

### Limitation of the study

Study included migrants staying in one town of the State Punjab only.

### Relevance of the study

This study has focused coverage of migrant population from endemic states living in non-endemic states for filaria transmission and assess need of MDA for these migrants to achieve goal to eliminate LF as a public health problem by 2020.

### Authors Contribution

Each author involved and contributed in planning study design, collection and analysis of data and carrying out the study.

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**Tables****TABLE- 1 STATE WISE DISTRIBUTION OF MIGRANT POPULATION PARTICIPATED IN STUDY AND MF POSITIVE PERSON**

State	Number of people examined	%	No of mf positive people	%
Bihar	450	41.20%	16	03.55%
Chhattisgarh	14	01.28%	02	14.28%
Jharkhand	14	00.37%	00	00.00%
Haryana*	04	01.28%	00	00.00%
MP	184	16.85%	02	01.08%
Odisha	118	10.81%	00	00.00%
Punjab*	20	01.83%	00	00.00%
Rajasthan*	06	00.55%	00	00.00%
UP	190	17.40%	02	01.05%
WB	90	08.24%	00	00.00%
Nepal	02	100%	00	00.00%
<b>Total</b>	<b>1092</b>	<b>100.00</b>	<b>22</b>	<b>02.01%</b>

\* Indicate non-endemic state - total person 30 (2.75%)

**TABLE 2 THE AGE WISE DISTRIBUTION OF STUDY POPULATION AND MF POSITIVE PERSON**

Age in years	Study population		No. of mf +ve person	%		
	Male	Female		Total		
<b>Below 10</b>	20	21	41	03.75	02	04.87
<b>10 - 20</b>	212	20	232	21.25	07	03.01
<b>21 - 30</b>	398	84	482	44.14	10	02.07
<b>31 - 40</b>	184	32	216	19.78	02	00.92
<b>41 - 50</b>	106	13	119	10.90	01	00.84
<b>Above 50</b>	02	00	02	00.18	00	00.00

**TABLE 3 THE TRADE WISE DISTRIBUTION OF STUDY POPULATION AND MF POSITIVE PERSON**

Trade	Study Population			%	No. of mf +ve persons	%
	Male	Female	Total			
<b>Un/Semi skilled</b>	662	136	798	78.70	15	01.87
<b>Skilled</b>	199	00	199	19.62	05	02.51
<b>Supervisor</b>	17	00	17	01.68	00	00.00
<b>Total</b>	<b>878</b>	<b>136</b>	<b>1014</b>	<b>100.00</b>	<b>20</b>	<b>01.97</b>

**TABLE 4 THE EDUCATION WISE DISTRIBUTION OF STUDY POPULATION AND MF POSITIVE PERSON**

Education	Study population			%	No mf +ve persons	%
	Male	Female	Total			
<b>Illiterate</b>	274	153	427	39.72	13	03.04
<b>Up to 5thstd</b>	324	07	331	30.79	07	02.11
<b>Up to 12 std</b>	308	00	308	28.65	01	00.32
<b>Diploma/Graduate</b>	09	00	09	00.84	00	00.00
<b>Total</b>	<b>915</b>	<b>160</b>	<b>1075</b>	<b>100.00</b>	<b>21</b>	<b>01.95</b>

**TABLE 5 THE DISTRIBUTION OF PERSON RECEIVED MDA IN LAST FIVE YEARS**

Number of times MDA received	Number of person received	Percentage
<b>Once</b>	151	13.83
<b>Twice</b>	42	03.84
<b>Thrice or more</b>	12	01.09
<b>None</b>	887	81.24
<b>Total</b>	<b>1092</b>	<b>100.00</b>