

## **Knowledge and perceptions about lymphatic filariasis: a study during the programme to eliminate lymphatic filariasis in an urban community of Orissa, India**

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**Abstract.** This study reports the knowledge and perceptions of the people with regard to cause and transmission of chronic forms of lymphatic filariasis (LF) and its elimination programme during mass drug administration (MDA) under the programme to eliminate LF in an urban area of Orissa, India. The paper is based on both quantitative and qualitative surveys undertaken before and after the first MDA among different socio-economic strata of the urban area. The data revealed that the urban residents are aware of the chronic forms of LF and also felt that LF is a problem in their area. But most of them do not know the role of mosquitoes in the transmission of the disease. A few people explained the association between LF and hydrocele, and the role of mosquitoes. In the present study, it is observed that poor knowledge about LF is highly influenced by socio-economic conditions. People from lower economic category were least aware of the cause of both lymphoedema and hydrocele. However, knowledge in some issues with regards to the disease and the awareness on MDA have increased significantly after MDA.

### INTRODUCTION

Lymphatic filariasis (LF) is one of the six diseases which have been targeted for elimination/eradication based on the consideration that human beings are the only reservoir of *Wuchereria bancrofti* infection that causes 95% of LF pathology. Annual single dose administration of diethylcarbamazine (DEC) could result in the effective elimination of infection by interruption of transmission (WHO, 1997). The most practical and feasible method of transmission interruption is rapid reduction of microfilarial load in the community by annual mass drug administration (MDA) of antifilarial drugs like DEC and albendazole. Based on this principle, the global programme to eliminate LF (GPELF) was developed. Being the largest filarial endemic country, the success of the programme is much dependant upon the Indian sub

continent, and it has been initiated in several endemic districts of India. However, it is known that five to ten rounds of treatment with 75-80% MDA compliance could possibly eradicate the disease by reducing transmission to very low levels. The evaluation of MDA coverage indicated that the compliance rates were not at desirable level (Ramaiah *et al.*, 2000; Babu & Satyanarayana, 2003; Babu & Kar, 2004). In the Indian state of Orissa, the MDA coverage is markedly low, i.e. 42% during the MDA undertaken in four districts in the year 2002 (Babu & Kar, 2004). The government of Orissa has initiated the programme in 1997 with MDA in two districts. In 2004, the programme has been expanded to 20 districts. Hence, many districts including the present study area have experienced MDA for the first time. The knowledge gap with regard to the disease and prevailing attitudes and perceptions towards the programme

may be the source of the major causes of lower compliance. Any strategy intended to bring change will have to take into account the range of people's knowledge and perceptions and how strongly these are rooted for the acceptance or rejection of such strategy. Hence, the present study intends to assess the people's perceptions and knowledge with regard to causation and transmission of chronic manifestations of LF and knowledge regarding the MDA before and after the MDA.

## MATERIALS AND METHODS

Data for the present study were collected from an urban area namely, Choudwar in Cuttack district of Orissa, where the MDA has been undertaken for the first time in September 2004. Choudwar is situated on the north bank of Birupa, a branch of river, Mahanadi. According to Census of India (2001), Choudwar town had a population of 52,498 of whom 28,243 (53.8%) were male and 24,255 (46.2%) were female. About 55% are workers, which include 28.3% of specifically industrial workers. Choudwar is an industrial area having six major industries and several small-scale industries. LF is endemic in this town with microfilarial rate of 5.2%. An Employees State Insurance (ESI) hospital and an ESI dispensary cater for the health needs of the industrial workers. Also, majority of Choudwar's general population depend on private practitioners and hospitals.

The studied urban area was taken as pilot area to develop and evaluate a strategy for the improvement of the MDA coverage in urban areas. In India, the MDA coverage was particularly poor in urban settings. In Orissa, it was found that the coverage of MDA undertaken in four districts in 2004 (25% vs. 49%) was markedly lower in urban areas than in rural settings (Babu & Kar, 2004). A newly developed intervention including social mobilization and a health communication campaign was undertaken before the MDA. KAP surveys were undertaken in the study area, before and after the MDA. The entire study area, based

on the socio-economic status of households was divided into four strata, i.e. high-income group (HIG), middle-income group (MIG), low-income group (LIG-1) and slums (designated as LIG-2). HIG wards were those, which have more than 60% of HIG houses. The same principle was applied for the identification of MIG and LIG-1 wards. The economic status of the household was determined based on the type of house and household appliances/furniture present in the house. This classification based on the relativity of above indicators, was used for operational purpose in this study. The list of slums and hutments were obtained from the municipality (local administrative authority) to identify LIG-2 areas. For household KAP surveys, two wards were selected randomly from each of first three strata. From each ward, five colonies/streets were selected randomly. A random point was selected in each colony/street and from there ten consecutive households were selected. For the selection of a sample from LIG-2, a list of all slums was prepared and from that list, ten slums were selected randomly. From each slum, 10 households were selected from five random points. Similar sampling procedure was followed during both the study phases. Thus, during pre MDA and post MDA surveys, 405 and 402 households were selected respectively. From each household, the head of the household or his wife was selected as the respondent. All the selected respondents agreed to participate in the study and none were denied. The mean ( $\pm$  standard deviation) of age of male and female respondents sampled during pre MDA survey were 45.9 $\pm$ 15.5 years and 39.1 $\pm$ 10.9 years, respectively. With respect to the respondents of post MDA survey, these values were 45.6 $\pm$ 15.3 years and 37.8 $\pm$ 10.7 years among male and female, respectively. A pre-tested KAP questionnaire was used to collect data on knowledge and perceptions regarding chronic manifestation of LF namely, lymphoedema and hydrocele and knowledge about the MDA programme. The questions included in the KAP questionnaire are reflected in Table 1. Before designing KAP questionnaire a few focus group discussions (FGDs) were organized by

Table 1. Knowledge of people about different manifestations and elimination programme of LF

Issues of knowledge about different manifestation and elimination programme of LF	Prior to MDA					After MDA				
	HIG n=106	MIG n=98	LIG-1 n=101	LIG-2 N=100	Total n=405	HIG n=101	MIG n=100	LIG-1 n=100	LIG-2 n=101	Total n=402
Know the accurate cause of lymphoedema	60.4	53.1	36.6	16.0	41.5	70.3	43.0	35.0	36.6*	46.3
Do not have any knowledge about the cause of lymphoedema	16.9	27.6	26.7	44.0	28.6	16.8	30.0	29.0	46.5	30.6
Having the accurate knowledge regarding transmission of lymphoedema	47.2	37.8	30.7	12.0	32.1	70.3*	40.0	33.0	23.8*	41.8*
Do not have any knowledge regarding transmission of lymphoedema	33.9	29.6	40.6	59.0	40.7	21.8*	39.0	45.0	56.4	40.5
Felt that they are at risk of getting lymphoedema	28.3	30.6	30.7	25.0	28.6	37.6	31.0	36.0	28.7	33.3
Know the accurate cause of hydrocele	20.8	10.2	13.9	4.0	12.3	9.9*	7.0	8.0	1.0	6.5*
Do not know the accurate cause of hydrocele	26.4	34.7	33.7	32.0	31.6	46.5*	39.0	48.0*	57.4*	47.8*
Aware about filariasis elimination programme	23.6	22.0	6.9	4.0	14.3	89.1*	98.0*	99.0*	98.0*	96.0*

\* Significant difference between pre and post MDA values ( $p < 0.05$ ).

following the standard methodology (Khan *et al.*, 1991; Kline *et al.*, 1992). A total of 30 FGDs (15 each during pre- and post MDA phases) were conducted in all types of wards and only adult community members were recruited for FGD. The participants were brought to a convenient place in their ward, which was acceptable to all participants. The FGDs were conducted by a moderator, experienced in focus group leadership techniques. The moderators were provided with a discussion guide, consisting of relevant core questions/issues that were posed to all groups. The questions/issues were on awareness and local terminologies of various forms of LF, and perception on elimination of LF. All discussions were held in Oriya, the local language, and extended on an average for approximately two hours. In FGDs, in addition to the moderator, a note taker was also present to note the list of

issues discussed and the reactions and responses of the participants. A team member who also monitored the entire process recorded the entire discussion on an audiocassette. Before concluding the discussion, short personal information was obtained from all respondents. After the discussion, the audiocassettes were played-back at the office and transcribed, with the field notes used as an adjunct. The KAP data were computerized and analysis was done through SPSS for Windows v.10.0.

## RESULTS

The details regarding knowledge of people about different manifestations and elimination of LF during pre and post MDA phases are shown in Table 1. The qualitative data obtained from FGDs

indicated that majority of people were aware of various disease manifestations including lymphoedema and hydrocele. Some persons said that, "*legs get swelled and fever occurs for 3 to 5 days if a person has the disease*". The KAP data indicate that only around 42% of people during pre MDA period had accurate knowledge about the cause of lymphoedema i.e. the association of LF with mosquito bites. In addition, around 30% of people do not possess any knowledge on causation of lymphoedema. High degree of disparity in the knowledge level is observed among different economic strata ( $p < 0.001$ ) and the knowledge is very low among slum dwellers (LIG-2). Majority of people linked LF with heredity. There is no significant increase in knowledge regarding accurate knowledge of cause of lymphoedema even after MDA. It is indicated that knowledge regarding transmission of lymphoedema was poor among the study population. However, there is an improvement in this indicator after MDA ( $p < 0.05$ ). Many people from the lower economic strata did not think that mosquito bite was the route of transmission of this disease. Some of the slum dwellers expressed that "*if healthy persons sit with diseased or if clothes of diseased are used that person will get the disease*". Some of the respondents from HIG also thought that filariasis may occur due to sharing of food and water. While a substantial proportion of the residents of the study area had an accurate knowledge about lymphoedema, very few people knew the cause of hydrocele. From FGDs, it was known that many residents from HIG and MIG also felt that LF was a major problem in their area. These data also revealed that many people expressed that LF cannot be eliminated. The risk perception with regard to the disease was very low in this community. Only about 29% of respondents during pre-MDA period and 33% of respondent during post MDA survey revealed that they were at risk of getting lymphoedema. The KAP data indicated that only 14% respondents were aware of MDA before MDA. After the implementation of MDA, a significant increase was noticed regarding the awareness of programme among the people

from all strata. More than 95% people in the study area became aware of MDA.

## DISCUSSION

The studied urban population was aware of different manifestations of LF but the knowledge on cause and transmission of these manifestations was poor. Most of them did not know the role of mosquitoes in the transmission of the disease, even after various health communication activities associated with MDA. Studies from other endemic countries, such as Thailand (Rauyajin *et al.*, 1995; Panvisavas & Ithijarakul, 1988), Ghana (Ahorlu *et al.*, 1999), Haiti (Eberhard *et al.*, 1996), Malaysia (Riji, 1986), Philippines (Lu *et al.*, 1988) and French Polynesia (Carme *et al.*, 1979) also reported poor awareness about the role of mosquitoes in the spread of LF. Similar findings were also reported from rural populations of India (Ramaiah *et al.*, 1996; Babu *et al.*, 2004). As most of the people were not aware of the association of vector mosquito with the disease, the risk perception was low in this community. Many of them, especially people from the lower economic stratum, had the idea that the disease was manifested only in the form of lymphoedema. It was evident from the data of FGDs that as people were not observing many lymphoedema cases in their locality; hence, some of them felt that they were not at risk of getting the disease. Few people explained the association between LF and hydrocele or the role of mosquito. Eberhard *et al.* (1996) reported similar findings in Haiti where none of the population associated hydrocele with filariasis or mosquitoes. Some people conceptualised that cause of lymphoedema and hydrocele were hereditary in nature, as the disease occurred in several generations of the same family. The present study attempted to establish the association between socioeconomic status and knowledge about LF. The correct knowledge on cause and transmission of LF and awareness about MDA was high among people belonging to HIG and decreased through people categorized as MIG, LIG-1

and LIG-2. An earlier study among rural population of Orissa reported that the caste affiliation, which corroborates highly with socio-economic status of an individual in India, was associated with the level of awareness and knowledge of LF (Babu *et al.*, 2004). People from lower socio-economic category were least aware about the cause and transmission of both lymphoedema and hydrocele. Such a gap in knowledge may create hindrance to the elimination of LF. People's knowledge base has to be strengthened and perception and attitudes to be addressed to achieve positive behavioural changes, which eventually would lead to higher compliance of MDA. In Tahiti, ethnic differences were reported with regard to people's acceptance of the scientific explanation regarding the cause of LF (Evans *et al.*, 1993). Education also usually corroborated with the socio-economic status of the people and a few studies reported that the educated people were found to be more knowledgeable about the cause and spread of LF (Lu *et al.*, 1988; Babu *et al.*, 2004).

Under the PELF, the principal tool of controlling LF was the rapid reduction of microfilarial load in the community by MDA of single dose of DEC or ivermectin with or without albendazole (Ottesen, 2000). By the end of 2005, the MDA has been initiated in 42 out of 83 endemic countries including India (WHO, 2006). It is known that single dose of an antifilarial drug administered annually can result in 90% reduction of microfilarial load, and that can interrupt transmission (Ottesen *et al.*, 1997). However, the percentage of the population covered during MDA was predictably the most important factor in determining the success of mass control/elimination programmes (Remme *et al.*, 1995). Although it is the eighth year of launching the national elimination programme, MDA is just being introduced in many states and the programme currently covers a small proportion of the population at risk. In the state of Orissa, only four rounds of MDA have been implemented and the first two rounds disappointingly reported only 42% compliance rates (Babu & Kar, 2004). The detailed description of MDA and

methods of MDA compliance evaluation were presented elsewhere (Babu & Kar, 2004; Babu *et al.*, 2006). Babu & Kar (2004) also investigated the factors associated with compliance of the second round of MDA in four districts of Orissa and observed that communities' knowledge regarding LF was poor and they gave a low priority to the prevention of the disease. MDA was initiated in the state of Orissa in 1997, but this MDA is the first one in the study area. A small percentage of people of the studied urban area knew about it before the commencement of MDA. However, after MDA, more than 90% of people knew about the programme. The recent MDA improved the knowledge base of the people on the programme. A study from Haiti also reported a high level (91%) of awareness of the programme after the MDA (Mathieu *et al.*, 2004). However, the knowledge on causation of the disease needs to be improved for the success of the elimination programme. Effective community mobilization activities are essential to strengthen the peoples' knowledge and to change their perception regarding LF.

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