

## Original Research Article

# Coverage and compliance of mass drug administration for elimination of lymphatic filariasis in Khammam district

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## ABSTRACT

**Background:** Lymphatic filariasis (LF) is an important public health and socio-economic problem in the world and it was identified as one of the six diseases, which could be targeted for elimination /eradication. Annual mass drug administration of DEC with selective vector control could result in the effective elimination of infection by interruption of transmission. The present study aimed to find the coverage and compliance of mass drug administration (MDA) of diethyl-carbamazine (DEC) for elimination of lymphatic filariasis (LF) in Khammam district in November 2009.

**Methods:** Cross-sectional, population-based, house-to-house survey was conducted after the round of MDA with DEC. Multi-stage systematic sampling method was used and four clusters were selected with 30 houses in each. A pretested questionnaire was used to interview the study participants. The data collected was analyzed and coverage rate, compliance rate and effective coverage rate were calculated.

**Results:** The coverage rate was 65.54% with variation across different areas. The compliance with drug ingestion was 71.14%. The effective coverage (46.63%) was much below the target (85%) which has to be targeted by intensive information, education and communication (IEC). Side effects of DEC were minimum, transient and drug-specific.

**Conclusions:** The coverage, compliance, and effective coverage rates were found to be lower than the target, which need to be intensified by extensive IEC.

**Keywords:** Lymphatic filariasis, Mass drug administration, Overall coverage rate, Patient compliance

## INTRODUCTION

Lymphatic filariasis (LF) is an important public health and socio-economic problem in the world not only due to morbidities and long term suffering, but also due to social stigma and considerable economic loss. LF is infection with the filarial worms, *Wuchereria bancrofti*, *Brugia malayi* or *B. timori* which are transmitted by culex, aedes and mansonias mosquitoes. In 2000 when the global

programme to eliminate lymphatic filariasis (GPELF) was launched 120 million people in 83 countries globally were infected with lymphatic filarial parasites, and it was estimated that over 1.3 billion (20% of the world's population) were at risk of acquiring infection. In 2015, the number of endemic countries has reduced to 73 as a result of the global programme activities.<sup>1</sup> In India, in 2007, 600 million people in 250 districts across 20 states

and union territories were estimated to be at risk of LF infection.<sup>2</sup>

In 1997, filariasis was identified as one of the six diseases, which could be targeted for elimination/eradication based on considerations that human beings are the only reservoir of infection, di-ethyl carbamazine (DEC) is an effective drug acting on the parasite. Mass annual single dose community drug administration of DEC with selective vector control could result in the effective elimination of infection by interruption of transmission. It has been shown that 5-10 rounds of treatment with 75-80% coverage could possibly eradicate LF by reducing transmission to low levels.<sup>3</sup> LF has been eliminated in many Asian countries through the MDA strategy.<sup>4</sup>

The world health assembly adopted resolution calling for elimination of LF as a global public health problem by 2020, following which the WHO launched the global programme to eliminate lymphatic filariasis in 2000 to help endemic countries initiate national programs.<sup>5</sup>

Since India is the largest filariasis endemic country in the world; the prospects of global elimination of filariasis will very much depend on its success in the Indian sub-continent.

National health policy 2002 (India) aims at elimination of transmission and prevention of disability due to LF by the year 2015.<sup>6</sup> National filaria day is being observed since 2004 in endemic districts in order to achieve elimination of lymphatic filariasis by the year 2015.

The elimination of LF can viably contribute to the achievement of the millennium development goals and a future free of lymphatic filariasis can reduce poverty and bring better health to poor people, prevent disability and strengthen health systems.<sup>4</sup>

Khammam district of Telangana (then part of undivided Andhra Pradesh) though not identified as an endemic to Filariasis, is a high risk area, hence mass drug administration (MDA) of diethyl-carbamazine (DEC) was carried out in the second week of November 2009. The present study was conducted in December 2009 with the aim to find the coverage and compliance and effective coverage of mass drug administration (MDA) of diethyl-carbamazine (DEC) for elimination of LF in Khammam district in November 2009.

## METHODS

### Study design

Cross-sectional population based house-to-house study.

A household interview survey using a semi-structured, pre-tested proforma was carried out within a month, i.e., first week of December 2009 for assessing the coverage

of distribution and compliance with consumption. The questions prepared were related to knowledge about the disease, side effects of the medicine, mode of drug delivery and Information, Education and Communication (IEC) before MDA programme in the area.

Multi-stage, systematic sampling method was used to select the villages/ward and the data collected using the proforma by interviewing in local language during house to house visit. The assessment was made in terms of proportion of people who have actually received DEC tablets (coverage of drug distribution) and compliance (consumption of tablet out of those who received tablets) in the selected areas. The data was analyzed by percentages and proportions.

Adhering to the criteria of NVBDCP, four clusters (one from urban and three from rural areas) from the district of Khammam were selected for the survey. The district had been stratified based on filarial endemicity (>10, 6-10 and <6); three clusters were chosen from the three strata in rural area and one from urban area based on the list obtained from the District authorities. The villages in each stratum were chosen randomly by using number tables and in each village 30 houses were again chosen by systematic sampling method in such a way that entire ward/village was represented. A total of 120 houses were selected.

The four study units were Pindiprolu, Chirumari, Mallepally and Budidampadu (Urban).

The investigators have made an attempt to collect information not only from the available informant of the family but also the consensus of the other family members who happened to be there at the time of visit. Every attempt has been made to win the confidence of the family members in the brief introduction.

## RESULTS

A total of 120 houses from four clusters (3 rural and 1 urban) were studied from the district, which yielded a population of 546 (411 rural and 135 urban). In our study, against a population of 546, 534 (97.8%) were eligible for MDA. The rest was either below 2 years of age or pregnant females (Table 1).

Out of 534 eligible persons only 350 (65.54%) received DEC. Against overall coverage rate of 65.54%, it was highest in urban area (78.46%) than in rural areas. The remaining 184, although eligible did not receive the drug for various reasons, drug distributor missing their house being commonest. Among those who received the drug 101 (18.92%) people did not consume the drug for various reasons, further reducing the compliance (Table 2).

The overall compliance with drug ingestion was 71.14% among those who received the drug varying from 61.25%

in Pindiprolu to 78.43% in Budidampadu (U). The effective coverage in four areas ranged from 38.28% (Pindiprolu) to 61.54% (Budidampadu) giving an overall

effective coverage of 46.63% in the study area which was much below the target (85%) (Table 3).

**Table 1: Demographic profile of eligible persons and drug recipients.**

Age groups (years)	Eligible persons			Population covered (of eligible)		
	Male	Female	Total	Male (%)	Female (%)	Total (%)
2-4.9	9	8	17	5 (55.55)	5 (62.5)	10 (58.82)
5-14.9	42	43	85	27 (64.28)	35 (81.39)	62 (72.94)
15-24.9	61	72	133	42 (68.85)	47 (65.27)	89 (66.91)
25-34.9	43	40	83	24 (55.81)	29 (72.5)	53 (63.85)
35-44.9	40	44	84	29 (72.5)	33 (75)	62 (73.81)
45-54.9	26	23	49	17 (65.38)	18 (78.26)	35 (71.42)
≥55	48	35	83	21 (43.75)	18 (51.42)	39 (46.98)
<b>Total</b>	<b>269</b>	<b>265</b>	<b>534</b>	<b>165 (61.34)</b>	<b>185 (69.81)</b>	<b>350 (65.54)</b>

(Numbers parenthesis indicate percentages).

**Table 2: Coverage and compliance of MDA.**

Coverage and compliance	No (%)
<b>Received and consumed</b>	249 (46.63)
<b>Received but not consumed</b>	101 (18.92)
<b>Did not receive</b>	184 (34.45)
<b>Total</b>	534 (100)

(Numbers parenthesis indicate column percentages).

**Table 3: Compliance and effective coverage (area wise).**

Village/ward	Eligible population	Population covered (of eligible)		Compliance		Effective coverage
		No	%	No	%	
<b>Pindiprolu</b>	128	80	62.5	49	61.25	38.28
<b>Chirumarri</b>	119	61	51.26	46	75.41	38.65
<b>Mallepalli</b>	157	107	68.15	74	69.16	47.13
<b>Budidampadu (U)</b>	130	102	78.46	80	78.43	61.54
<b>Total</b>	534	350	65.54	249	71.14	46.63

**Table 4: Drug consumption pattern.**

Gender	Swallowed in front of DD	Swallowed in absence of DD	Total
	N (%)	N (%)	
<b>Male</b>	78 (66.67)	39 (33.33)	117
<b>Female</b>	96 (72.72)	36 (27.28)	132
<b>Total</b>	174 (69.88)	75 (30.12)	249

(Numbers parenthesis indicate percentages); (numbers parenthesis indicate row percentages).

Coverage of MDA DEC was highest (73.81%) in the 35-44.9 years age group and least (46.98%) among those aged 55 years or above (Table 1). Both coverage and compliance of MDA DEC were better among females than males, though the difference in coverage was more, the difference in compliance was minimal. The pattern of drug consumption showed that more people swallowed the drug in presence of the drug distributor (69.88%), emphasizing that directly observed treatment model was more effective (Table 4).

Most of the respondents (40.5%) reported that they came to know about MDA through media (miking and TV/radio) and 27.5% reported drumbeating as the mode of publicity and remaining by the health workers or posters.

Side effects of DEC were minimum reported only by 18 (7.23%) persons, with giddiness being the most common (55.5%) followed by vomiting (38.9%) (Table 5). They were transient and drug-specific.

**Table 5: Type of side effects.**

Type of side effects	Few hrs - <24 hrs
	N (%)
<b>Giddiness</b>	10 (52.6)
<b>Vomiting</b>	7 (36.9)
<b>Irritability</b>	2 (10.5)
<b>Total</b>	19†

One of them had more than one symptoms (18 people reported of side effects).

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Overall coverage was better in urban (78.43%) than rural (61.38%) areas. In the present study fear of side effects (47%) was the predominant reason for non-compliance with ingestion of the drug, followed by the reason of absence of the disease (34%) (Table 6).

**Table 6: Reasons for non-compliance.**

Reasons	No (%)
<b>Fear of side effects</b>	48 (47.53%)
<b>No disease</b>	34 (33.66%)
<b>Others</b>	19 (18.81%)
<b>Total</b>	101

The reported coverage rate across India was 86.69% for the same year.<sup>6</sup>

## DISCUSSION

The present study aimed to identify the factors responsible for compliance and non-compliance of mass drug administration (MDA) under the programme to eliminate lymphatic filariasis (LF) from Khammam, Telangana (then undivided Andhra Pradesh). It was based on both quantitative (through household MDA coverage survey) and qualitative data (through semi-structured interviews with heads of compliant and non-compliant households) collected following an MDA held in December 2009 in Khammam district. In this district, 65.54% of the eligible population received the drug (coverage) which is close to what was observed by Mukhopadhyay et al and only 71.14% people actually consumed the drug (compliance) among those who received it giving an effective coverage of 46.63% which is less than what was observed in a study in Karnataka.<sup>7</sup> Around 34% people did not receive the drug despite of being eligible, which is slightly higher than observed in Karnataka.<sup>7</sup> The predominant reason for not receiving the drug at household level was that the drug distributor did not visit the household. The fear of adverse reactions is the predominant reason for not consuming the drug, followed by the reason of not having the disease were similar to those cited by Babu and Satyanarayana in a study in East Godavari district of Andhra Pradesh in 2003.<sup>8</sup>

Most common side effects were giddiness and vomiting, similar to those observed by Babu and Satyanarayana (2003),<sup>8</sup> whereas vomiting was more common in a study in Gujarat.<sup>9</sup>

The qualitative data revealed that the major contributor to taking the drug was the awareness that drug protects them from LF; motivation by health workers being another reason for compliance. In many endemic areas, the issues related to non-compliance were taken casually during implementation.

Although there is now greater international momentum for lymphatic filariasis elimination, several important issues remain to be resolved, before the disease can be eliminated from India. These includes uncertainty about the required coverage and duration of annual treatment to achieve elimination and its relation to endemicity levels and vector/parasite complexes.<sup>10</sup>

In the present study, 28 (40.5%) respondents came to know about MDA through media (miking and TV, radio) and 19 (27.5%) through drumbeating. Mukhopadhyay et al (2008) in their study found that 77.8% respondents came to know about MDA from health personnel and 20.8% through media whereas NGO's had very little involvement (1.2%).<sup>11</sup>

## CONCLUSION

The success and sustainability of MDA based programmes require an understanding of the relevant perceptions and practices of the people living in endemic communities. The MDA programme can get more coverage by motivating the drug distributors and the compliance can be improved by health education and intensive IEC activities prior to the MDA rounds.

The programme could well achieve the targets of elimination if implemented properly, as such similar strategies have helped other endemic countries to reach reduced transmission rates and in some elimination.

Hence, it is imperative to make the programme more efficient by addressing the issues linked to low coverage and compliance as well.

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