

Mass Drug Administration for Lymphatic Filariasis Elimination in Two Districts of North Karnataka: Coverage and Compliance Assessment

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Abstract:

Introduction: Lymphatic filariasis or elephantiasis is the most debilitating and disfiguring scourge among all diseases which imposes severe social and economic burden. Currently an estimated 63 crores people are at a risk of filariasis in 256 endemic districts across 16 states and 5 union territories in India. National filarial control programme is operational since 1955 in India and the current goal is achieving elimination of filariasis by 2020 through Mass Drug Administration (MDA). **Objective:** To assess the coverage, compliance and causes for noncompliance of MDA in the study districts. **Method:** A cross sectional descriptive study was conducted between October 2019 and January 2020 in Koppal and Bidar districts respectively. Randomly four clusters were selected with three from rural area and one from urban area. All the residents of a cluster were included except subjects aged below 2 years and pregnant women. Data collection was done by household survey using a standard questionnaire. **Results:** Total populations of 2043 subjects residing in 480 houses were included. The coverage rate was 95.44 & 94.73% with compliance rate of 91.61% & 93.12% in Koppal & Bidar districts, respectively. The effective coverage rate was 87.44 % & 88.2% in Koppal & Bidar districts respectively. Drug consumption by DOT was 95.1% in Koppal & 85.8% in Bidar district. **Conclusions:** The coverage & compliance of MDA was found to be satisfactory as it was >65%. Consumption of MDA by DOT to be more emphasized to reduce coverage compliance gap and increase the effective coverage rate.

Key words: Coverage, Compliance, Evaluation, Filariasis, Mass drug administration.

Introduction:

Lymphatic filariasis or elephantiasis is one of the most debilitating and disfiguring disease causing significant morbidity & imposes severe social and economic burden to the affected individuals, their families and the endemic communities.^[1]

Filariasis is caused by nematodes of the family Filarioidea belonging to three species namely *Wuchereria bancrofti*, *Brugia Malayi* and *Brugia Timori* and transmitted through the vector female *Culex quinquefasciatus* mosquito.^[2]

The lymphatic filariasis disease is largely asymptomatic. However, there can be chronic damage to the lymphatic, immune and secretory system of the body without any manifestation. The disease is

associated with peculiar morphological manifestations and disfigurements resulting in severe social stigma and severe economic and mental stress of the affected.^[3]

Globally an estimated 89.3 crores people living in 49 countries remain threatened by lymphatic filariasis and require preventive chemotherapy to stop the spread of this parasitic infection. It is one of the leading causes of global disability, accounting for at least 28lacs Disability Associated Life Years (DALYs). Most of the endemic countries for lymphatic filariasis around the world are situated in south East Asian region of World Health Organization (WHO) and account for nearly 50% of the lymphatic filariasis cases. 9 out of the 11 member countries of the South

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East Asia Region (SEAR) including India are endemic for Filariasis.^[2] In India around 63 crores people residing across the rural and urban areas of 256 districts in 16 states and 5 union territories are at risk of the disease. Karnataka is one of the endemic states with the disease being endemic in 9 districts of Karnataka.^[2,4]

In the year 1997 lymphatic filariasis (LF) was classified as one of six infectious diseases considered to be “eradicable” or “potentially eradicable”. Consequently, World Health Assembly adopted a resolution calling for elimination of the disease as a global public health problem. In 2000, the World Health Organization (WHO) established the Global Programme to Eliminate Lymphatic Filariasis (GPELF), which had the goal of eliminating lymphatic filariasis as a public health problem by the year 2020. In addition the International Task Force for Disease Eradication has identified lymphatic filariasis as one of the few diseases that could potentially be eradicated.^[5-7]

Mass Drug Administration was launched as National Filaria Day (NFD) on 5th June, 2004 by Government of India to eliminate filariasis. The strategy included Mass Drug Administration (MDA) of anti-filarial drugs (Diethylcarbamazine + Albendazole) by approaching every individual annually in the target community of 250 endemic districts in India, thus interrupting the transmission.^[1]

The National Health Policy 2002 set a goal to achieve the elimination of Lymphatic filariasis by the year 2015 which couldn't be achieved. The National health Policy 2017 also aimed at elimination of lymphatic filariasis by the end 2017 but this aim was also not achieved. Subsequently in the year 2018 an “Accelerated plan for elimination of lymphatic filariasis” was launched with a goal to achieve lymphatic filariasis elimination by the year 2020 in accordance with WHO NTD goals.^[1,6,8-10]

As of 2018 a total of 15 rounds of MDA have been completed in the State. Bidar being one of the endemic districts for lymphatic filariasis the 16th round of MDA was conducted in 2019-20. Koppal though being a non-endemic district, the state technical committee advised focal round of MDA to be done as the Microfilaria rate in focal 13 villages was found to be more than 1 during the night blood survey.^[11]

On request of the Regional Office for Health and Family Welfare, Government of India, to evaluate MDA in Koppal and Bidar districts, a team of investigators visited these districts with the objective of assessing the coverage, compliance and coverage compliance gap of MDA in these districts.

Method:

This was a Cross sectional Epidemiological study conducted in Koppal and Bidar districts by a team of investigators from a medical college during second week of October 2019 and second week of January 2020, respectively. The investigators team were informally trained at the Regional Office for Health and Family Welfare, Bangalore in all aspects of the coverage survey.

All the sampled eligible population residing in the study area minimum for a period of six months and consenting for the study were included. The pregnant women and children aged less than two years were excluded from the survey.

As per the guidelines provided in MDA evaluation template, total of four clusters were selected in each district which included one cluster in the urban and three in the rural areas. All the primary health centers in the district were line listed based on the reported MDA coverage. Subsequently one PHC with high coverage, one PHC with medium coverage & one PHC with low coverage were chosen randomly by lottery method. Subsequently from each of these PHCs line listing of all the villages under its field practice area was done and one village with high coverage, one village with medium coverage and one village with low coverage were chosen by lottery method. For selection of urban cluster all the urban PHC's with low coverage were line listed and one of the wards was chosen randomly.^[12]

The team of investigators visited each of the above village/ ward which were identified and interacted with the drug distributors and supervisors regarding their knowledge of MDA, adverse events following MDA, adequacy of training and suggestions for improvement.

For population based data collection, center of the village was identified by taking the help of a resident of the village; from there the four directions were identified and numbered. One direction was chosen randomly using the last digit printed on the currency

Table 1: Socio demographic profile of the study subjects:

Variables	Koppal District n = 1075	Bidar District n = 968
Age (Years)		
2 – 15 years	207(19.25)	262(27.06)
>15 years	868(80.75)	706(72.94)
Sex		
Males	581(54.05)	501(51.75)
Females	494(45.95)	467(48.25)
Houses visited	240	240

*Figures in parenthesis indicate percentage

Table 2: Distribution of study subjects based on the tablet consumption:

Variables	Koppal District n = 1075	Bidar District n = 968
MDA coverage	1026(95.44)	917(94.73)
MDA compliance	940(91.61)	854(93.12)
Effective coverage rate	87.44	88.22
Coverage compliance gap	8.38	6.87
Drug consumption by DOT	894(95.1)	772(85.8)
Divided dose	-	133(13.74)
Incomplete dose	Nil	74(7.64)

Indicates more than one response

*Figures in parenthesis indicate percentage

note and a walk through survey was done to note the average number of houses in the street. Subsequently using a currency note, investigators selected the first house randomly and the data regarding socio-demographic characteristics, which included details of the family composition information regarding distribution of MDA tablets, consumption of MDA tablets if received, if consumed [Directly Observed Treatment] DOT or non DOT, whether taken full course

Table 3: Reasons for non-consumption of tablets:

Reasons#	Koppal District n = 1075	Bidar District n = 968
Drug distributor not visited	24 (2.23)	51(5.26)
Out of station	28(2.6)	05(0.51)
Suffering from chronic disease other than filaria	12(1.11)	18(1.85)
Not aware	14(1.3)	-
Fear of drugs	15(1.39)	-
Beneficiaries on empty stomach at the time of drug distributor visit	15 (1.39)	18(1.85)
No specific reason	16 (1.48)	10(1.03)

Indicates more than one response

*Figures in parenthesis indicate percentage

Table 4: Adverse effects experienced following consumption of tablets:

Side reactions	Koppal District n = 1075	Bidar District n = 968
Headache	15 (1.39)	-
Nausea / Vomiting	89 (8.27)	07(0.72)
Others#	21 (1.95)	-

* Figures in parenthesis indicate percentage

others included syncope, diarrhoea, pain abdomen, Headache etc.

or not and if full course was taken was it a divided dose or all tablets taken at once were collected using a semi-structured survey proforma by interview technique after obtaining the consent. Prior to the interview the purpose of the survey was explained with showing of flashcard containing a picture of elephantiasis case, Diethylcarbamazine (DEC) and

albendazole tablets. Data was also collected regarding history of adverse drug reactions experienced following MDA consumption. Reasons for not consuming MDA were ascertained from subjects who had not consumed MDA. Subsequently the direction to choose the next house was decided by tossing a coin and the data collection was continued till 60 houses was covered in that particular cluster.

The data was entered in Microsoft Excel-10 and analyzed with SPSS 16. Descriptive statistics like frequencies & percentages were used wherever applicable.

Definitions of various indices used:^[11]

Drug coverage: It is the number of eligible persons who received DEC during MDA campaign. It is calculated as the total number of persons who received drug divided by eligible population expressed as percentage.

Drug compliance: It is the number of persons who ingested DEC in presence of a Drug Distributor (DD) during MDA campaign. It is calculated as the total number of persons who ingested drug divided by total number of persons who received the drug expressed as percentage.

Coverage-Compliance Gap: It refers to the people who got the drug but did not consume due to various reasons.

Effective coverage rate: It is the end product of coverage by the health system and compliance by community. The percentage for effective coverage was calculated after taking total number of people who were eligible for receiving DEC tablets as denominator (Effective coverage = No. of people who had ingested sufficient dose of DEC tablets/Total people eligible for receiving the DEC tablets \times 100). Inputs for the study were also obtained from the previous MDA evaluation done in the year 2018 at two endemic districts of Karnataka by the same principal investigator.^[12]

Ethical issues:

Ethical clearance was obtained from the institutional ethics committee and informed consent was taken from all the subjects.

Results:

The study team visited 240 houses in 4 clusters (1 in urban + 3 in rural area) in each district i.e., a total of 480 houses and surveyed 2149 (1132 + 1017) people

of which 2043 (1075 + 968) were eligible and were included as subjects [Table 1]. The coverage, compliance rate, effective coverage rate & coverage compliance rate is satisfactory as mentioned in the below tables [Table 2]. The most common reason for non-consumption was that the drug distributor had not visited apart from other reasons cited [Table 3]. Majority of the side effects following drug consumption were mild & self-limiting [Table 4].

Discussion:

Lymphatic filariasis though is one of the potentially eradicable disease continues to be an important public health problem. Various targets were fixed by the government in the past to achieve elimination but targets could not be achieved. Annual Mass Drug Administration with coverage of more than 85% is the established and recommended strategy to achieve the filariasis elimination.^[1]

In the present study, the coverage in both the study districts was more than 85% (95.4% in Koppal district & 94.73% in Bidar district) which is satisfactory. On comparing with previous studies there is good improvement in the coverage and compliance rates over the years. Evaluation conducted in the year 2008 by Ranganath et al found the coverage rate in Bidar was 78% with a compliance of 68%.^[13] This may be due to improved training activities for drug distributors along with better acceptance of MDA by the beneficiaries.

The coverage evaluation conducted in the year 2014 by Ravish et al found a coverage of 83.5%, compliance of 75.9%, effective coverage rate of 63.4% & coverage compliance gap of 24.14%.^[14] There is an improvement in effective coverage rate the final end product over the years which may be due to better program implementation as in our present study the effective coverage rate was 88.2% in Bidar district.

A similar coverage evaluation conducted in the year 2015 by Ravindranath A Bhovi et al in Bidar district found a coverage rate of 82.5%, compliance of 82.5% & effective coverage rate of 59.6%.^[15]

The coverage evaluation conducted in the year 2016 by Mane VP et al in Bidar district it was found that the coverage, compliance and effective coverage to MDA were 82.1%, 72.3% and 59.4% respectively.^[16]

The coverage evaluation of MDA conducted in the year 2018 in Kalaburagi & Yadgir districts revealed that

coverage was 83.17% & 86.71% respectively, which is much lower compared to the present study which may be due to the different district administrations & lack of proper training among the drug distributors.^[12]

Hence it is evident that the coverage and compliance in Bidar district is improved over the years. Mere coverage of MDA is not sufficient for filarial control & elimination but compliance to drugs is also important to eliminate Lymphatic Filariasis.

Consumption of MDA by DOT is an important component to ensure complete & adequate treatment but only 95.1% of the subjects in Koppal district & 85.8% in Bidar district had consumed MDA by DOT. The commonest answer by beneficiaries was "not taken food" at the time of distribution. Consumption of MDA by DOT is to be more emphasized.

The main reason for non-compliance was that the subjects being out of station in Koppal district and drug distributor not visited in Bidar district. Other reasons were lack of awareness about the disease, fear of side effects of drugs, not suffering from the filariasis disease etc. In studies conducted in Yadgiri and Gulbarga districts, the most common reasons given for non-consumption were fear of side effects and forgetting. Even though people are aware of the disease of elephantiasis, seen people living with the condition in their vicinity, they are not willing to consume tablets because of various reasons. This shows the lack of motivation, mobilization, and misconception about regimen and community participation.^[12]

The other reasons for non consumption were that patients were suffering from other chronic diseases like diabetes & hypertension, fear of drugs and beneficiaries on empty stomach at the time of visit by the drug distributor.

Around 11.3% subjects in Koppal district & 0.72% subjects in Bidar district had adverse reactions of which the most were self limiting. The percentage of subjects who had reported adverse reactions in Koppal were higher compared to similar studies done in Raichur district(1.1%) in 2014 and Gulbarga district(1.22%) in 2018. Thus it is evident that the side reactions occurring are mostly mild & self limiting.^[12,17]

Conclusion:

The coverage & effective coverage rate of MDA in

both the districts is more than 65% which is the recommended standards for achieving filariasis elimination.^[18]

The proportion of consumption of MDA by DOT needs improvement in Bidar district. Thus by ensuring consumption of MDA by DOT the effective coverage rate, compliance rate can be improved and the proportion of subjects consuming divided dose & incomplete dose can be reduced along with reduction of coverage compliance gap. The most common reason for non-consumption of MDA was that the drug distributor had not visited. Most of the side effects experienced during MDA were mild & self limiting with nausea & vomiting being most common. Overall the MDA campaign in both the districts is satisfactory. Thus with continued efforts the ultimate aim of achieving the lymphatic filariasis elimination can be achieved.

Declaration:

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Conflict of Interest: Nil

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