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# **Original Research Article**

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# **Evaluation of mass drug administration against lymphatic filariasis** in Bidar district, Karnataka, India

Vijaykumar P. Mane, Ravindranath A. Bhovi\*

Department of Community Medicine, Koppal Institute of Medical sciences, Koppal, Karnataka, India

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# \*Correspondence:

Dr. Ravindranath A. Bhovi, E-mail: drravibhovi@gmail.com

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## **ABSTRACT**

**Background:** Lymphatic filariasis is a major public health problem in India not only because it causes considerable suffering, deformity and disability but also due to social stigma and economic loss associated with it. The Government of India in 2004 began a nationwide mass drug administration (MDA) campaign in all the known endemic districts with the aim of eliminating it as a public health problem. However, even after a decade, uncertainty prevails about the coverage and compliance to MDA. Objectives of the study were to estimate coverage and compliance to mass drug administration (MDA) in Bidar district and to identify the various reasons for noncompliance to MDA.

**Methods:** A cross sectional evaluation survey was conducted in the month of September 2016 in Bidar district using multi-stage cluster sampling technique. A total of 744 subjects were interviewed and information was collected in a predesigned questionnaire after taking an informed consent. Data thus obtained were entered and analyzed using Epi info software version 3.5.4.

**Results:** The coverage, compliance and effective compliance to MDA in Bidar district were 82.1%, 72.3% and 59.4% respectively. The most common reasons for non-compliance to MDA were fear of side reactions followed by suffering from other chronic diseases and having no faith in tablets. The most common side reactions associated with drug intake were vomiting and fever.

**Conclusions:** The present study demonstrates poor compliance to MDA in Bidar district despite good coverage, indicating an urgent need to revitalize the programme implementation.

**Keywords:** Filariasis, Compliance, Surveys and questionnaires

#### INTRODUCTION

Lymphatic filariasis (LF) is one of the oldest and most debilitating neglected tropical diseases. Commonly known as Elephantiasis, it is a painful and profoundly disfiguring disease caused by three species of parasitic worms - *Wuchereria bancrofti*, *Brugia malayi* and *Brugia timori*, which are transmitted to humans by mosquitoes. The disease manifestations range from none to both acute and chronic manifestations such as lymphangitis, lymphadenitis, elephantiasis of genitals, legs and arms or

as a hypersensitivity state such as tropical pulmonary eosinophilia. Though not fatal, the disease is responsible for considerable suffering, deformity and disability. In fact, it is one of the world's leading cause of permanent and long term disability.<sup>1-4</sup>

LF is a major public health problem across the globe. It is endemic in 83 countries and territories, with more than a billion people at risk of infection. An estimated 120 million people are already affected worldwide of whom about 40 million are incapacitated and disfigured by the

disease. About 63% of the world's population with the disease resides in Southeast Asia Region and nearly one third live in India alone. It is estimated that 554.2 million people in India are at risk of infection in 243 districts across 20 states/ union territories. The economic effects of disease are devastating, as patients with disability have reduced work capacity and household income. This limits their ability to pay for healthcare, education and basic household expenses. Besides, it equally damages their social life by ostracizing them from their families and communities.<sup>7</sup>

World Health Organization (WHO) in the year 2000 launched Global programme to eliminate lymphatic Filariasis (GPELF) with an ambitious goal to eliminate Lymphatic Filariasis by 2020 and Mass administration (MDA) was recognized as the main strategy to achieve it. The effectiveness of MDA has been found to be directly related to the proportion of the total population that takes the medicines every year (known as the epidemiological drug coverage) and the minimum effective coverage has been considered as 65%. Consequently, the Government of India in 2004 began a nationwide MDA campaign in all the known LF endemic districts with an annual single dose of diethylcarbamazine citrate (DEC) along with home-based management of lymphedema, with the aim of eliminating LF as a public health problem by the year 2015.<sup>2,4-9</sup> Since then, the MDA coverage in India has gradually increased from 73% in 2004 to 85% in 2014, which is well above the required minimum coverage.<sup>10</sup>

A high coverage of more than 85% in endemic areas, which is sustained for five years, is required to achieve interruption of transmission and elimination of the disease in India. Even though the drug distribution in the country is more than 85%, the proportion of people who actually consume drugs vary widely depending on the geographical and socio-cultural factors. When a proportion of the population fails to comply with MDA, a potential reservoir for the parasite is left untreated, keeping the door open to recrudescence of the micro filaraemia (mf) and thus reducing the probability of the program's success. 11, 12 With this background, the following survey was undertaken as an Independent evaluation of MDA in Bidar district, which is one of the six endemic district for LF in Karnataka state.

# Objectives of the study

- To estimate coverage and compliance to mass drug administration (MDA) in Bidar district.
- To identify the various reasons for non-compliance to MDA.

# **METHODS**

The present survey was a cross sectional study conducted as an Independent evaluation of 13<sup>th</sup> additional round of MDA campaign in the Bidar district. This survey was

conducted in the month of September 2016 as per Regional Office for Health and Family Welfare (ROHFW), Bangalore guidelines, following MDA campaign in Bidar district in August 2016.

## Sampling design

Multistage sampling technique was used for subject selection. As per the guidelines, four sites/clusters were selected – 1 urban and 3 rural.

Selection of urban site/cluster: A list of all the urban sites along with their reported coverage for MDA in Bidar district was prepared. An area coming under 10 bedded Urban Health Training Center (UHTC) in Bidar taluk itself was selected as urban site/cluster by Lottery method.

Selection of rural site/cluster: There were totally 57 Primary Health Centres (PHC) in the rural part of the district. As per guidelines, we were supposed to select one cluster each from low, medium and high coverage areas. In order to select these three sites/clusters, all the PHCs were arranged in descending order based on the district reported coverage of MDA. The difference between the highest coverage (108%) and the lowest coverage (70%) was 39%. This difference was divided by 3 to classify all the PHCs into three strata as High (96 – 108), Medium (83 - 95) and Low (70 - 82) coverage areas for MDA. From each stratum, one PHC was selected randomly using Lottery method. The selected PHCs were GH Aurad in Aurad taluk under the high, Donagapur in Bhalki taluk under medium and Hallikhed K in Humanabad taluk under low coverage strata. Subsequent selection of one sub-center in each PHC and villages in selected sub-centres was done by simple random sampling.

#### Data collection

The households in the villages were randomly selected and all the members of the household present at the time of visit were interviewed for data collection using a predesigned proforma after taking an informed consent. The minimum number of persons to be interviewed were 150 per site/cluster as per guidelines, thus making a minimum sample size of 600.

# Exclusion criteria

Exclusion criteria were beneficiaries absent at the time of house visit; temporary visitors/ guests to the house.

# Definition of few terms/parameters used in the survey

Coverage: is defined as the proportion of eligible population who received MDA medications. Compliance: is defined as the proportion of persons who have consumed MDA medications, irrespective of dose, among those who have received it.

*Effective compliance:* is defined as the proportion of total eligible population who consumed MDA medications, irrespective of dose.

Even though the survey was conducted for both Diethylcarbamazine (DEC) and Albendazole administered for MDA campaign, results pertaining only to DEC are presented in this paper.

## Statistical analysis

The data collected were analyzed using Epi info software version 3.5.4.

#### **RESULTS**

The team visited a total of 182 families in all the four sites/clusters and interviewed 744 subjects during the survey.

Table 1: Distribution of study population according to age and gender (n=744).

Age	Male N (%)	Female N (%)	Total (%)
<15 yrs	83 (46.6)	95 (53.4)	178 (100)
15 yrs and above	275 (48.5)	291 (51.5)	566 (100)
Total	358 (48.1)	386 (51.9)	744 (100)

Table 1 shows the age and sex distribution of the study population. It is evident from the table that the number of females was marginally higher than males in both the age groups presented. Out of the 744 subjects interviewed, 722 were eligible at the time of MDA campaign while others were ineligible for either being pregnant or for being aged less than two years.

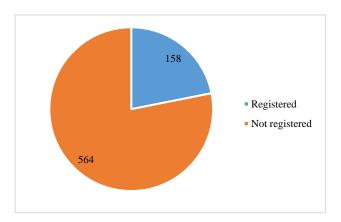


Figure 1: Distribution of eligible study subjects according to their registration for MDA (n=722).

As per protocol health workers were supposed to do a preliminary survey of eligible population in their locality and prepare a separate register of the same for undertaking MDA campaign. This was assessed at the time of survey and it was found that majority i.e. 564 (78.1%) of the beneficiary names were not entered in the registers.

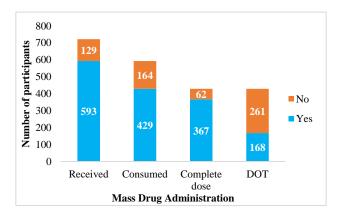


Figure 2: Distribution of study subjects according to their status of receipt, compliance, dose and mode of consumption of MDA.

Figure 2 depicts the distribution of eligible study subjects according to their status of receipt, compliance, dose of intake and method of consumption of MDA. Out of the 722 eligible beneficiaries in the survey, majority i.e. 593 (82.1%) said to have received the drug (coverage) and out of those 593 who received MDA, 429 (72.3%) agreed to have taken drugs (compliance). So out of the total eligible surveyed population, only 429 (59.4%) subjects have consumed drugs considering all the constraints from the suppliers and consumer side (Effective compliance rate), which explains the real coverage of MDA. Out of those who have consumed MDA drugs, majority i.e. 367 (85.5%) have taken the full course and only 168 (39.1%) told to have taken drugs by DOT (Directly observed treatment).

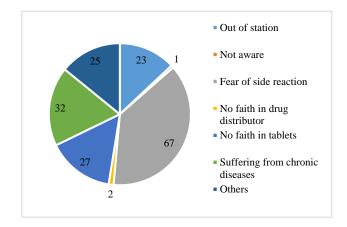


Figure 3: Distribution of non-consumers of MDA drugs according to various reasons cited (n=164).

Figure 3 demonstrates the distribution of non-consumers of MDA drugs according to various reasons. Around 164 study participants accepted not to have consumed drugs for various reasons in spite of having received them. The most common reason given by majority i.e. 67 (40.8%)

was fear of side reactions followed by suffering from other chronic diseases in 32 (19.5%) and having no faith in tablets in 27 (16.4%) of subjects. Few respondents gave multiple reasons for non-consumption.

Table 2: Distribution of study subjects according to various side reactions (n=429).

Side reactions	Number of subjects (N)	Percentage (%)
Fever	8	1.9
Vomiting	13	3
Nausea	0	0
Others	13	3
None	395	92.1
Total	429	100

Table 2 shows the distribution of study subjects having suffered from various side reactions. MDA is known to cause side reactions in few subjects and the information regarding the same was recorded during the survey. Out of the 429 study subjects who consumed tablets, very few i.e. 34 (7.9%) reported to have suffered side reactions and it was found that majority had vomiting followed by fever.

#### **DISCUSSION**

Massive efforts have been taken by the national and state governments along with WHO towards elimination of LF in India. For transmission control the recommended approach is supervised mass drug administration by door to door visit. The MDA coverage in the present study was 82.1% similar to the findings of the survey conducted by Kulakarni et al in Uttara Kannada district in 2013, Anil in Gulbarga district in 2011, Gudegowda et al in Bagalkot district, Ravish et al in Bijapur districts of Karnataka, Mishra et al in Odisha, Pradeepkumar et al in Gujarat as well as national MDA coverage in the year 2014. However, a couple of earlier surveys done in Bidar district itself had lesser coverage indicating a gradual improvement over the years.

The compliance rate among those who received MDA, was 72.3% in the Bidar district similar to the findings of few other studies done in neighboring districts during different time periods. 13,20 On the contrary, many other studies had very poor compliance rates despite having very good coverage rates. 4,11,12,15,18,20,21 However, a study done by Gudegowda in Bagalkot district of Karnataka in the year 2016 found very high compliance of 99% among those who received MDA. 14 This difference in compliance rates could be due to differences in study settings, differences in time periods, differences in profile of study participants, differences in sampling techniques etc. Effective compliance rate which represents the real coverage for MDA was much lower (59.4%) in the present study comparable to the findings of studies done in Uttara kannada and Bijapur districts. 11,15 Further the actual benefit from MDA could be even less as around 85.5% of consumers have taken full dose/course of

MDA, which is only half (50.8%) of the total eligible population. Only 39.1% of the consumers have taken tablets in front of the drug distributor, which is less than even one fourth (23.26%) of total beneficiaries.

Nearly one in every four beneficiaries who received drugs accepted that they have not consumed it and the most common reason quoted by them was fear of side reactions which confirms to the findings of many other studies. <sup>11-13</sup>,16,20,21 Around 8% of the beneficiaries who consumed tablets complained to have suffered side reactions which is much higher compared to those reported in other studies. <sup>12,13</sup>,15,16 This needs to be addressed on a priority basis as they bring discredit to the campaign and can constitute the cause of non-compliance in future.

#### **CONCLUSION**

The present study demonstrates poor compliance to MDA in Bidar district despite good coverage, indicating an urgent need to revitalize the programme implementation. IEC activities should be intensified through various approaches of mass media and interpersonal communication about the importance of drug intake to improve coverage. The drug distributors must ensure that the drugs are swallowed by beneficiaries in full dose that too in their presence to improve compliance. Mop-up activities must be undertaken to cover those who were missed on the campaign day. Adequate communication efforts should be undertaken in the community to remove the fear associated with side effects of MDA drugs. Community leaders, elected representatives and religious leaders should be involved to create awareness about MDA and in winning the co-operation of reluctant families or individuals.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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