Coverage Evaluation Survey of Mass Drug Administration Strategy to Eliminate Lymphatic Filariasis in North Karnataka Region. Are We on Track?

N. A. Gururaj¹, Ramesh¹, G. Ajaykumar¹, K. Ravikumar², B. G. Devendrappa¹

ABSTRACT

Background: Lymphatic filariasis (LF) is a major public health problem in India next only to malaria. India is one of 72 endemic countries globally. India has the target for filariasis elimination by 2020 using mass drug administration (MDA) campaign which is a WHO-recommended strategy for elimination. Despite, decades after launching nationwide MDA campaign, uncertainty prevails over its coverage and compliance. The objectives of the present study were to estimate the coverage and compliance of MDA against LF and reasons for non-consumption of drugs in the endemic Bidar district. Methodology: A community-based cross-sectional study was conducted in the month of October 2018 in Bidar district using multi-stage cluster sampling technique. A total of 1157 subjects were interviewed. Data collection was done by personal interview method after obtaining informed consent using a standard, validated questionnaire prescribed in the program. Data thus collected entered into Microsoft Excel sheet and analyzed using SPSS software. Results: A total of 1157 subjects residing in 218 houses were interviewed. The majority of the study subjects 951 (79.1%) were in the age group of more than 15 years with predominantly males 613 (51.0%). The coverage rate and compliance rate of MDA were 73.1% and 75.1%, respectively. The effective compliance rate and coverage compliance gap were 57.2% and 17%, respectively. Only 47% of subjects consumed drugs in the presence of a drug distributor. A total of 219 subjects did not consume drugs. About 51.85% told drug distributor not visited, and 4.9% told out of the station. Conclusions: The MDA coverage and compliance in the study district are inadequate There is need for motivation of drug distributors to sustain gains achieved in the previous rounds and intensive IEC activities to improve community participation. Key words: Compliance, coverage, filariasis, mass drug administration

INTRODUCTION

Lymphatic filariasis (LF) or elephantiasis is one of the oldest and most debilitating of all the neglected tropical diseases. This disease is caused by infection with three species of parasites Wuchereria bancrofti, Brugia Malayi, and Brugia Timori which are transmitted to humans through mosquito bites. The infection starts in childhood and accumulates through adulthood, damaging lymphatic vessels resulting in irreversible chronic disabling conditions such as lymphedema, elephantiasis, and hydrocele inflicting stigma, mental suffering, social deprivation, and economic loss and is a major cause of poverty in the affected communities.[1] In India, 99.4% of infections are caused by W. bancrofti and rest by Brugia Malayi. It is more prevalent among urban poor and affects all segments of the rural population. The infection starts in childhood and accumulates through adulthood. The transmission of LF occurs through mosquitoes namely Culex quinquefasciatus. Humans are the exclusive host of infection with W. bancrofti.[2,3]

In 1997, the WHO classified LF, as potentially eradicable following advances in diagnosis and treatment of the disease.

¹Department of Community Medicine, Gulbarga Institute of Medical Sciences, Kalaburagi, Karnataka, India
²Senior Regional Director, ROHFW, Kendriya Sadan, Koramangala, Bengaluru, Karnataka, India

Correspondence: Dr. N. A. Gururaj, Department of Community Medicine, Gulbarga Institute of Medical Sciences, Kalaburagi, Karnataka, India. E-mail: gnandihal@gmail.com

Globally, 73 countries are at the risk of LF, the disease is mainly endemic in the WHO Southeast Asian region. Totally nine of the 11 member countries are endemic for filariasis, which includes nearly 50% of the LF cases of the world. Sri Lanka and Maldives both being member states of WHO SEARO successfully eliminated LF setting an example for other member states. In India, it is a serious public health problem; around 600 million people are at the risk of infection living in 250 districts of 15 states and union territories which are endemic for filariasis. It is more prevalent among urban poor and affects all segments of the rural population. Karnataka is one of the endemic states for filariasis with the disease being endemic in nine districts of Karnataka. The study setting Bidar district is one of the endemic districts for filariasis.

In India, the program to eliminate LF was launched in the year 2004 covering all 250 endemic districts. The strategy involved the annual mass drug administration (MDA) of anti-filarial drugs (Diethylcarbamazine + Albendazole) by approaching every individual in the target community thus interrupting the transmission. The National Health Policy (2002) set the goal of elimination of LF by 2015 but the disease continued to be endemic, subsequently, National health policy 2017 had set the deadline of 2017 which was also not achieved.

The 15th round of MDA was done in the month of September 2018 with subsequent mop-up activity. The effectiveness of the LF elimination depends on the consumption of the recommended drug by the affected population. Although MDA alone has been shown to suppress transmission of LF in many areas where it has been implemented, it is often accompanied by resurgence once there is a residual infection in the population. Therefore, the sustainabilty of transmission suppression could be achieved only through the integration of different strategies of vector control along with regular evaluation surveys of MDA.

Hence, this independent evaluation survey was undertaken to assess the coverage and compliance of MDA in Bidar district by the medical college team on request from the regional office for health and family welfare, Bengaluru.

METHODOLOGY

The independent survey was initiated following clearance from the institutional ethics committee and was conducted in October 2018 1 month after mass distribution of antifilarial drugs (Albendazole and DEC).

Research Question

What is the coverage and compliance of MDA conducted in the year 2018 for the elimination of LF in Bidar district?

Study Setting

The study was conducted in Bidar district which is one of the filarial endemic districts in Karnataka. It consists of five talukas Bidar, Basavakalyan, Humnabad, Aurad, and Bhalki.

Study Design

Community-based cross-sectional study design was used.

Study Period

The study period was conducted in the month of October 2018 for 10 days period.

Study Population

All the eligible adult population residing in the study area.

Exclusion Criteria

The pregnant, lactating women, and children aged <2 years were excluded from the eligible study population.

Sample Size

As per the guidelines of MDA survey, a minimum of 1200 households should be interviewed.

Sampling Method

Multi-stage sampling method was used to ensure randomness in the selection of villages. There are six talukas in the district, as per the guidelines, four clusters (Three in rural areas and one in the urban area) were to be selected from the district. The cluster in the urban area was selected after line listing of all the primary health centers in urban area and one urban primary health center was chosen randomly. The rural clusters in the district were selected after line listing all the primary health centers in rural area and classification based on the coverage as low coverage (<50%), medium coverage (50–80%), and high coverage (>80%), subsequently one primary healthcare (PHC) was selected in each of the three classes; thus, a total of three clusters were selected from rural area of each district. District coverage data were obtained by the district vector borne disease control office. The respective selected PHC’s were Talamadagi in Humnabad taluk, Godempalli in Bidar taluk,
and Wadagao in Aurad taluk. In the selected primary health centers, the sub centers (SC) under the PHC were arranged in descending order of the coverage. The high performance SC in the first group was selected and the medium one was selected in the second one and the poor performance SC was selected in the third one. This selection was made giving the weight to the performance of each SC. A village is selected from each of the SC randomly. After the selection of the clusters respective PHC/UHC was visited and one village/one ward was chosen randomly and 60 houses were selected randomly from each cluster. The households in the villages were contacted and the details were collected as per the pre-designed schedule.

Flow chart showing the sampled four areas (three rural areas and one urban area) in the study.

Survey
After selecting the village, center of the village/ward was identified, a pen was dropped at the center of the village and in the direction of pen point, a street was selected. Later, a house was selected randomly in the same street and this became the first house for data collection. Subsequently, data collection was continued until 60 houses were interviewed in each cluster. Data collection was face to face interview method using a pre-tested semi-structured questionnaire after obtaining informal consent from a responsible and eligible adult family member.

Collection of Data at the Village Level
The team of investigators visited PHC’s and then selected SCs. They interacted with the concerned drug distributors in the selected SCs as well as the medical officers of the PHC’s. Investigators visited the selected villages and with the help of drug distributors collected the required information from the residents of the villages. In total, 120 houses were visited during the survey, with a minimum of 30 houses in each of the clusters. Data were computed in Microsoft Excel and analyzed using statistical software SPSS-16. Descriptive statistics like frequencies, percentages, and the mean and standard deviation were used.

RESULTS
In the present study, four clusters were included covering a total study population of 1200, of which 1157 eligible subjects were interviewed residing in 218 houses. Forty-three persons (4.5%) were not eligible for receiving drug as per guidelines, namely, <2 years and pregnancy, feeding mothers. Hence, the beneficiary population then works out to be 1157. The majority of study subjects were in the age group of more than 15 years 951 (79.1%) and were predominantly males 613 (51.0%), as shown in Table 1.

Out of the 1157, 881 (76%) persons have responded that they had received the drugs and 24% had not received the drugs, as shown in Table 2.

Out of the 881 persons who have received the drugs, 662 (75.1%) persons have responded that they have consumed the drugs, as shown in Table 3. Overall Effective Compliance Rate and coverage compliance gap in Bidar district was 57.2% and 19%, respectively.

Effective compliance rate calculated by formula

\[
\text{Effective compliance rate} = \left( \frac{\text{No. of persons consumed drugs}}{\text{Total eligible population}} \right) \times 100
\]

Table 1: Age- and gender-wise distribution of the study subjects (n=1200)

<table>
<thead>
<tr>
<th>Age/Sex</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;15 years</td>
<td>481 (40.0)</td>
<td>470 (39.1)</td>
<td>951 (79.1)</td>
</tr>
<tr>
<td>&gt;15 years</td>
<td>132 (11.0)</td>
<td>117 (9.8)</td>
<td>249 (20.8)</td>
</tr>
<tr>
<td>Total</td>
<td>613 (51.0)</td>
<td>587 (48.9)</td>
<td>1200 (100)</td>
</tr>
</tbody>
</table>

*Figures in parenthesis indicate percentages

Table 2: Distribution of study subjects based on whether they had received drugs (n=1157)

<table>
<thead>
<tr>
<th>Received drugs</th>
<th>No. of persons</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>881</td>
<td>76.1</td>
</tr>
<tr>
<td>No</td>
<td>276</td>
<td>23.9</td>
</tr>
<tr>
<td>Total</td>
<td>1157</td>
<td>100.0</td>
</tr>
</tbody>
</table>
As per the program guidelines, though it is mandatory to administer MDA under direct observation (DOT), Out of 662 subjects consumed, only 317 (47.8%) consumed in the presence of drug distributor/DOT is shown in Table 4.

Non-consumption is one of the important issues to be addressed in the program. In the present study, the main reason for non-consumption was, drug distributor not visited (51.8%), followed by out of station (4.9%) and lack of awareness (3.8%).

Out of 881 subjects consumed drugs. Adverse drug reactions are reported among 20 (2.2%) subjects. Nausea and vomiting were the major side effects experienced following consumption of drugs, followed by fever and other side effects and all adverse reactions were mild and subsided without any complications.

The majority of study participants (98%) cited “Drug distributor” as the source of information regarding MDA program.

DISCUSSION

LF is a disease causing significant morbidity which is largely endemic in South East Asia region of the WHO. The WHO recommended the MDA strategy helps to achieve the goal of eliminating LF in a cost effective and socially-responsible manner. The operational guidelines for the elimination of LF in India prescribe, MDA of a single dose of two drugs (Diethylcarbamazine + Albendazole) in endemic areas, with coverage of >85% administered over 5 years as an effective strategy to interrupt the transmission and eliminate the disease.[4,12] Bidar is one of the endemic districts in India. The first round of MDA was started from the year 2004 in India. This was the 15th round of MDA in this district.

The coverage rate of MDA in the present study was 76% which is far below the expected coverage to achieve the interruption of transmission and elimination of disease.[11] However, effective coverage rate (ECR) is a better indicator and the same needs to be taken into consideration during evaluation. ECR is only 57.2%, very poor as it is far below the set target. On the contrary, independent surveys conducted by Mane and Bhovi (2016) and Hoolageri et al. (2017) in the same district, reported coverage rate of 82.1% and 96.5%, respectively.[13,14] On comparison with evaluation survey conducted by Shivalingaiah et al. in neighboring Kalaburagi and Yadgir districts (2018), coverage rate is very low compared to Yadgir district (86.71%) and Kalaburagi district (83.17%).[4] The low coverage of MDA in present study may indicate lack of motivation among the drug distributors to cover the entire eligible population, which is essential for elimination of the disease. Therefore, this aspect needs to be given more emphasis during training sessions and also need for the observation of supervisors appointed for MDA need to be brought under the daily activity schedule and to be monitored at PHC/district level to have concurrent/consecutive supervision.[15]

Next to coverage, more important aspect in MDA is compliance to drugs which helps to effectively prevent filariais transmission in the community by killing the filarial larvae. In present study, compliance rate was 75%. On comparison to studies conducted by Mane and Bhovi (2016) and by Hoolageri et al. (2017) in same Bidar district reported compliance rate of 85.4% and 72.3%, respectively, showing further decrease in compliance rate compared to previous year which is indicator of lack of sustainable efforts in implementation of program which further prolongs the progress toward elimination.[11,13] On the contrary, studies conducted by Shivalingaiah et al. in neighboring Kalaburagi and Yadgir districts in 2018 where the compliance rate was 92.46% and 86.98%, respectively.[4] Compliance rate in studies conducted by Mahalakshmy et al. in Puducherry, and Karmakar et al. in West Bengal were 88.7% and 86.5%, respectively.[16,17] Low compliance rate in the present study is because of first the low coverage rate in the district, lack of emphasis on consumption of drugs under supervision and no community participation. This shows lack of motivation and insufficient community mobilization from gross root level health workers.

The ECR in the present study was 57.2%. On the contrary, studies conducted by Hoolageri et al. and Mane and Bhovi in Bidar dist where ECR was 78.3% and 68%, respectively.[11,14] A study by Shivalingaiah et al. in neighboring Kalaburagi and Yadgir districts (2018) reported 76.8% and 75.4%, respectively, which are better than the present study.[4] These reports show that there is a lack of motivation and commitment for the MDA program among both the drug distributors and beneficiaries. The low ECR may be the reason for not able to achieve elimination through MDA strategy in program, even after the recommended period of 5–7 years.[15]

Non-consumption is one of the important issues to be addressed in the program which affects compliance rate. In
the present study, the main reasons cited by study participants were, “Drug distributor not visited” Followed by “Out of station” and “Lack of awareness,” indicating the need for supportive supervision of drug distribution activity by a supervisor and also need for prior IEC activities to raise the awareness level among community before initiation of MDA activity. In a study conducted by Mane and Bhovi in the same district in 2016 reported “fear of side reaction” and “suffering from chronic diseases” were reasons for non-consumption.[13]

Only 2.2% of the study subjects had minor side reactions such as nausea, vomiting, and fever following consumption of drugs. Studies by Mane and Bhovi in Bidar district and Angadi et al. (2015) in Raichur district reported 2.2% and 1.1% side effects, respectively.[14,15]

Despite decades after launching program for elimination of filariasis through effective MDA strategy, there is slow progress in achieving the recommended target. This shows that the tools are available (knowledge and drugs), but attitudes must change among health workers involved in program implementation to practice the guidelines strictly to eliminate the disease with the full community participation. It is incomplete without incorporating integrated vector control measures and entomological studies which are necessary to achieve the target of elimination of LF by the year 2020.[4]

CONCLUSIONS

The overall coverage of MDA in Bidar district was 76% and the compliance rate was 75.1% which is very low compared to the recommended standards to achieve elimination. To improve coverage rate and DOT consumption, more emphasis on importance of distribution of drugs to all eligible subjects during training and supervisors need to be appointed and brought under the daily activity schedule and to be monitored strictly at PHC/district level to have concurrent supervision. Thus by emphasizing consumption of MDA by DOT the ECR, compliance rate can be improved and the proportion of subjects consuming complete dose can be improved along with the reduction of coverage compliance gap. Regular IEC activities need to be conducted especially through inter personnel communication in all endemic pockets. Hence, this process needs to be improved before beginning MDA round along with regular mosquito larval control measures can be initiated to bring down the vector density to avoid transmission ultimately achieving elimination from India.

ACKNOWLEDGEMENTS

We express our sincere gratitude to the Senior Regional Director, Dr Ravikumar, ROHFW, Bngaluru, for entrusting the project to our medical college team. We express our heartfelt gratitude to our college Director and Principal for giving the support and cooperation in conducting the survey. We extend our sincere thanks to the support and cooperation provided by DHO, Bidar dist., and District Vector Borne Disease Control Officer and all staff of District vector borne disease control office, Medical Officers of Primary Health centers, Health workers, Anganwadi workers, and ASHAs and all the study subjects.

REFERENCES

13. Mane VP, Bhovi RA. Evaluation of mass drug administration against lymphatic filariasis in Bidar district, Karnataka, India.


