Coverage and compliance of mass drug administration programme for elimination of filariasis in an endemic district of North Karnataka, India

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Abstract

Background: Lymphatic Filariasis (LF) is one of the important public health, social and economic problem faced by many developing countries. It is endemic in 83 countries and territories, with more than a billion people are at risk of infection. While the infection may be acquired during childhood its visible manifestations may occur in later life, leading to temporary or permanent disability. Mass drug administration (MDA) is one of very important strategies to eliminate filariasis.

Methodology: A Cross-sectional study conducted from October to December 2020 in four clusters of two talukas of Bagalkot district. A total of 234 households were covered under the study with a minimum of 50 houses from each of the clusters.

Results: Among 234 houses comprising 1150 population, 568 (49.4%) were males and 582 (50.6%) were females. Majority, i.e. 776 (67.48%) were in the age group 15 to 60 years. Coverage rate of MDA in the district was 97% and compliance rate among the beneficiaries was 95%. Only 41.5% of them had consumed in front of drug distributors during MDA programme.

Results: Among 234 houses comprising 1150 population, 568 (49.4%) were males and 582 (50.6%) were females. Majority, i.e. 776 (67.48%) were in the age group 15 to 60 years. Coverage rate of MDA in the district was 97% and compliance rate among the beneficiaries was 95%. Only 41.5% of them had consumed in front of drug distributors during MDA programme.

Conclusion: The best strategies to improve the compliance were to consumption of the tablets in front of drug distributors but this was very low in this study area. Information, Education and Communication (IEC) activities about the disease and the programme need to be strengthened.

Key words: Lymphatic Filariasis, Mass Drug Administration, Coverage, Compliance.

Introduction

Lymphatic filariasis (LF), is one of the important neglected tropical disease (NTD) It is caused by microscopic, thread-like parasitic worms. The adult worms only live in the lymphatic system. The disease is usually transmitted through the bite of an infectious mosquito[1].

The affected patients can suffer from lymph edema which presents as elephantiasis, in men, there may be hydrocele. It is a leading cause of permanent disability in the world. Affected people are frequently unable to work because of their disability[1].

Throughout the tropics and sub-tropics of Asia, Africa, the Western Pacific, and parts of the Caribbean and South America an estimated 120 million people in 72 countries are affected by Lymphatic filariasis[2].

About 40 million people are incapacitated and disfigured because of the disease. In communities where filariasis is transmitted, populations of all ages are affected. A childhood infection may manifest at as limbs oedema, which may occur later in life, causing temporary or permanent disability. There is a major social and economic impact in the endemic countries due to filariasis. It is one of the world's leading causes of permanent and long-term disability with an estimated 5.1 million disability adjusted life years (DALYs) are lost. About 863 million people in 47 countries remain threatened by lymphatic filariasis.

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Preventive chemotherapy is effective in stopping the spread of parasitic infection[2].

The clinical manifestations of Lymphatic filariasis can cause acute attacks, lymphoedema/elephantiasis and hydrocoele. Recurrent bacterial infection of the lower limbs are caused by the adult worms which cause inflammation of the lymphatic system leading to lymphatic vessel damage and lymphatic dysfunction. These secondary infections provoke "acute attacks", which are the commonest symptom of LF and play important role in the progression of lymphoedema. Acute attack is usually associated with local pain and swelling and with fever and chills[3].

Elephantiasis is an advanced form of Lymphoedema, primarily occurring in the lower limbs and are commoner in women. In its most advanced form, elephantiasis prevents people from carrying out normal daily activities. Swelling of the scrotum and penis due to LF is an advanced form presenting as hydrocoele[2].

The greater part of infected people are asymptomatic, but there is some form of damages to the lymphatic system and the kidneys. People infected with filariasis who have microfilaremia should receive antifilarial drug treatment to eliminate microfilariae. But the currently available medicines have limited effect on adult worms. Another important aspect of the treatment is the management of morbidity and disability prevention (MMDP) that includes simple hygiene measures, such as basic skin care and exercise, to prevent acute attacks and progression of lymphoedema to elephantiasis. Surgical management for hydrocoele may be appropriate. Psychological and socioeconomic support to people with disability are also included in MMDP, so that they have access to rehabilitation services and opportunities for health, education, and income. Activities of rehabilitation include promoting positive attitudes towards people with disabilities, disabilities prevention, education, and training, and supporting micro- and macro-income-generating schemes[2].

Preventive chemotherapy is effective at community level for elimination of microfilaria. The National Health Policy (2002) aimed to Eliminate Lymphatic Filariasis in India by 2015. Later extended to 2021. The Global Alliance to Eliminate Lymphatic Filariasis (GAELF) was formed in the year 2000. The Mass Drug Administration (MDA) has two strategies for interruption of transmission i.e. no new case and Morbidity Management and Disability Prevention (MMDP) for catering the disease afflicted patients for elimination[4].

Mass Drug Administration (MDA) was started as mass campaign from 2004, initially with single dose of diethylcarbamazine (DEC). In the year of 2007 with use of DEC and albendazole co-administration and from 2018 started with Triple Drug Therapy (IDA) i.e. DEC + Albendazole + Ivermectin which was launched initially in five selected districts[5].

Aim of global elimination of LF as a public health problem can be achieved by effective surveillance. This survey was to assess the actual coverage of MDA of single dose DEC and albendazole in Bagalkot district of Karnataka state and to recommend improvements if required. This evaluation survey was conducted soon after the MDA campaign by the department of Community medicine of S. Nijalingappa Medical College, Bagalkot for the GOI through Chief Medical Officer, Regional Office for Health and Family Welfare, Bengaluru.

Material and methods

This study was conducted from October to December 2020. The survey were conducted within a month after actual administration of drugs so as to avoid recall bias. As per the instructions from the Regional Office of Health, Government of India, Bengaluru, a total of four clusters were selected in the district by a multistage random sampling technique. Three from rural areas and one from an urban ward were selected. In Bagalkot district, Badami and Hunagund talukas were endemic for filariasis.

All Primary Health Centres in these talukas were listed out according to percentage of drug distribution. Three PHCs were selected, one PHC each from low coverage, medium coverage and high coverage. Villages in the selected PHCs were listed out based on the coverage. One village each from low coverage, medium coverage and high coverage were selected for the assessment.

One Low Coverage Municipality/ward based on the percentage of drug distribution from the district for consumption survey was selected.

In this manner, the villages of Konkanakoppa, Kamatagi and Aminagadh were selected from the PHCs of Katageri, Kamatagi and Aminagadh, respectively. The urban ward with low coverage under the Guledagudda CHC was enlisted as the urban cluster. The investigators visited the selected villages and from the center point of the village the survey was started towards one randomly chosen direction with the help of local residents. Then, the investigators conducted a house to house survey in the street and one adult member within the age group of 18–60 years from each house were interviewed in the survey. After explaining the purpose of the survey and obtaining verbal consent, direct interview technique,

using a structured proforma, was employed to obtain data regarding the demographic profile, awareness about lymphatic filariasis, coverage, compliance, adverse drug reactions, etc. The posters containing a picture of an elephantiasis case and tablets was used to explain about the survey to participants. A total of 234 households were covered under the study with a minimum of 50 houses from each of the clusters.

Statistical analysis

The data collected were entered in MS Excel 2010 and analyzed using SPSS version 23. Descriptive statistical measures such as percentages, mean, and standard deviation were applied. Inferential statistical test such as Chisquare test was applied to find the association between locality with coverage and compliance. Ztest for difference between two proportions was applied to test the difference in coverage–compliance gap (CCG) between rural and urban areas. The difference and association were interpreted as statistically significant at $P < 0.05$. Results were expressed in the form of tables and graphs and figures as relevant.

Results:

General characteristics

Table 1: Age wise distribution of study population

Age group (years)	Frequency	Percent
0-2	26	2.25%
2-5	80	6.95%
6-14	175	15.22%
15-60	776	67.48%
60 & above	93	8.10%
Total	**1150**	**100%**

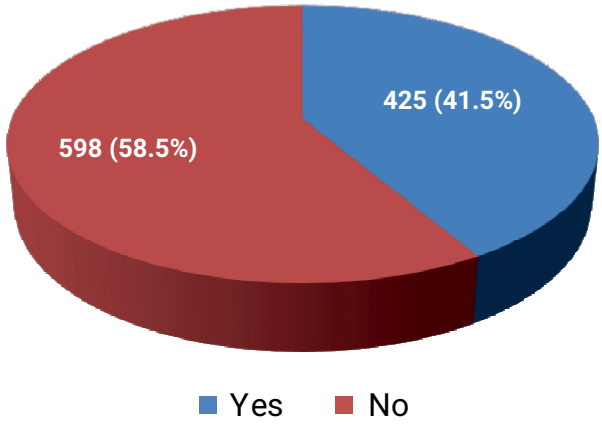
Among 234 houses comprising 1150 population, 568 (49.4%) were males and 582 (50.6%) were females. Majority, i.e. 776 (67.48%) were in the age group 15 to 60 years (Table 1).

Coverage and compliance of MDA

Table 2: Distribution of respondents according to drug received (coverage rate) and drug consumed (compliance rate).

Drugs received	Frequency	Percentage
Yes	1044	97%
No	29	3%
Total beneficiaries	1073	100%
Drugs consumed		
Yes	1023	95%
No	50	5%
Total beneficiaries	1073	100%

Out of 1150 the beneficiaries were 1073 and MDA (DEC + Albendazole) was distributed to 1044 beneficiaries. Thus coverage rate in Bagalkot district was 97%. Among the beneficiaries, 1023 had consumed full course of tablets. Thus compliance rate among the beneficiaries was 95%. Coverage was good in all the surveyed villages but compliance was low in Aminagadh village when compared to other places. (Table 2)



Graph1: Consumption of Drugs in front of the Drug distributors

Among those who had consumed tablets, only 425 (41.5%) of them had consumed in front of drug distributors (DD) (Graph 1).

Table 3: Distribution of study population according to reasons for not taking DEC tablets

Reason for non consumption	Frequency	Percentage
Absent during MDA	21	42%
No information	14	28%
Fear of drugs	06	12%
Why to take drugs when not suffering from LF	03	6%
Empty stomach	06	12%
Total	**50**	**100%**

The most common reason quoted by the beneficiaries for not consuming the tablet was their absence during MDA, lack of information of MDA programme/ LF, followed by fear of drugs, empty stomach and why to take drugs when not suffering from LF. (Table: 3)

Among those who consumed tablets, 22 (2.15%) had developed adverse effect. Among them, 12 (54.5%) had developed nausea/ vomiting and 10 (45.5%) had developed dizziness. All the events lasted for less than 24 hours. None of them required any medication and the illness was self-limiting.

Awareness of filariasis and MDA among beneficiaries

Majority of the respondents, 1080 (94%) had awareness regarding elephantiasis and 254 (22.1%) had seen a case of elephantiasis in their vicinity. Most common source of information was by Anganwadi

workers/ Accredited Social Health Activist (ASHA) followed by Auxiliary Nurse Midwife (ANM) and majority of respondents had a opinion that Anganwadi workers/ ASHA should be the drug distributor.

Discussion:

Enormous efforts are put in by the National and State governments along with WHO, towards elimination of LF in India[2].

The National Health Policy (2002) has set the goal of Elimination of Lymphatic Filariasis in India by 2015 which was later extended to 2021[5] However; multiple studies showed that the main limitation of this programme is a comparatively poor coverage of drug distribution and consumption. The rate of coverage and compliance is the most crucial factor in the success of MDA programme and this is to a large extent dependent on the type of personnel involved in drug distribution[2].

In this study, majority of them (75.58%) were in the age group of >15 yr (Table 1). Out of 1150 surveyed population the beneficiaries were 1073 and MDA (DEC + Albendazole) was distributed to 1044 beneficiaries. Thus coverage rate in Bagalkot district was 97%. Among the beneficiaries, 1023 had consumed full course of tablets. Thus compliance rate among the beneficiaries was 95%. Coverage was good in all the surveyed villages but compliance was low in Aminagadh village when compared to other places (Table 2) The coverage observed was higher than the study conducted by Kumar et al in Udupi district, Kulkarni et al in Bijapur district and Karmakar et al in West Bengal.

In a study done by Kumar et al in Udupi district of Karnataka, out of the total 1118 eligible population 821 (73.4%) received the DEC tablets, therefore, the coverage rate was 73.4%. Among those who received tablets, it was observed that only 775 (94.4%) of the individuals received the adequate dose and only 703 people actually consumed the tablets. Hence, compliance rate was 85.6%[6].

In a study done by Kulkarni P et al in Bijapur district of Karnataka, Among the 398 beneficiaries, MDA (DEC + Albendazole) was distributed to 320 beneficiaries. Thus coverage rate in Vijayapura district was 80.4%. Among the beneficiaries who had received the tablets, 289 had consumed full course of tablets. Thus compliance among the beneficiaries who had received the tablets was 72.6%. The coverage and compliance of MDA was higher in rural areas compared to urban areas[7].

In a study done by Karmakar et al in West Bengal, the drugs were received by 435 (55.91%) persons in those 109 families (total eligible 481). Drug distributor gave inappropriate doses to 7.9% persons due to fear of side effects or misclassification. In these families also, 9.56% persons refused the drug or drug distributor did not give the drug as they were suffering from various diseases[8].

The best strategies to improve the compliance were to consumption of the tablets in front of drug distributors but this was very low in this study area. Only 425 (41.5%) of the beneficiaries had consumed in front of drug distributors (DD) (Graph 1). The reasons for not consuming tablets in front of drug distributors were being out of home and being in empty stomach.

The most common reason quoted by the beneficiaries for not consuming the tablet was their absence during MDA, lack of information of MDA programme/ LF, followed by fear of drugs, empty stomach and why to take drugs when not suffering from LF. (Table: 3)

Among those who consumed tablets, 22 (2.15%) had developed adverse effect. Among them, 12 (54.5%) had developed nausea/ vomiting and 10 (45.5%) had developed dizziness. All the events lasted for less than 24 hours. None of them required any medication and the illness was self-limiting.

In Udupi study, around 324 (28.3%) did not receive the tablets. Failure to deliver the drug was reported by 224 (69.2%) as common reason. People did not perceive filariasis as a serious health problem and felt they will not be affected by the disease as 118 (14.3%) people who received tablets did not consume the tablets. The most common reason for not swallowing the drug was the fear of side-effects 95 (80.6%) while 8 (6.7%) did not consume for the reason of failure to deliver the drugs. Side-effects were seen only among 8 (0.72%) of them[6].

In Bijapur study, the most common reason quoted by the beneficiaries for not consuming the tablet was lack of information of MDA programme/ LF (13%), followed by fear of drugs (10%), why to take drugs when not suffering from LF (7%) and empty stomach (1%). Among those who consumed tablets, 7 (2.4%) had developed adverse effect. Among them, 4 (57.8%) had developed nausea/ vomiting and 3 (42.2%) had developed dizziness. All the events lasted for less than 24 hours. None of them required any medication[7]

In a study done by Mohammad A Hussain et al in Odisha, Nearly 99% of the studied individuals in both rural and urban areas received DEC and ABZ during the MDA campaign. However, less than a third (28% in the rural areas and 31% in the urban areas) had consumed the distributed drugs. The fear of side effects (77%) was the major cause for non consumption[9].

Majority of the respondents, 1080 (94%) had awareness regarding elephantiasis and only 254

(22.1%) had seen a case of elephantiasis in their vicinity. In study by Kulkarni et al in Bijapur district, 40.8% of the respondents had seen a case of filariasis in their vicinity whereas and 74% had seen a case of filariasis in their vicinity as observation made by Dharukaswami et al in Bidar district[10].

Most common source of information was by Anganwadi workers/ Accredited Social Health Activist (ASHA) followed by Auxiliary Nurse Midwife (ANM) and majority of respondents had a opinion that Anganwadi workers/ ASHA should be the drug distributor.

In a study done in udupi district of Karnataka by kumar et al, 73 (31.7%) respondents came to know about MDA from health personnel, 128 (55.6%) through media (TV, radio and miking) and 42 (18.2%) from NGOs[6]. Mukhopadhyay et al 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%).?

In Bijapur study, Majority of the respondents, 86 (71.7%) had awareness regarding elephantiasis and 49 (40.8%) had seen a case of elephantiasis in their vicinity. 77 (64.2%) of the respondents had awareness about MDA programme and 41 (34.2%) respondents were aware about MDA programme before the day of distribution. Most common source of information was by Anganwadi workers/ Accredited Social Health Activist (ASHA) followed by Auxiliary Nurse Midwife (ANM) and majority of respondents opinion that Anganwadi workers/ ASHA should be the drug distributor[7].

Conclusion:

Coverage rate of MDA in the district was 97% and compliance rate among the beneficiaries was 95%. Only 41.5% of them had consumed in front of drug distributors during MDA programme.

The most common reason quoted by the beneficiaries for not consuming the tablet was their absence during MDA, lack of information of MDA programme/ LF, followed by fear of drugs, empty stomach and why to take drugs when not suffering from LF.

The study showed that there is a need to strengthen the MDA programme planning and implementation in terms of creating awareness through appropriate media in the community. It can be achieved by effective microplanning, improved supervision, emphasizing more strongly health work force training thereby to improve the coverage and compliance through community participation. Even though the side-effects were very few and minor in our study which also need to be addressed as they may constitute cause of future non-compliance. Information about the Rapid Response Team (RRT) must be widely publicized to increase the faith of people which will indirectly result in better compliance.

Recommendations: The attention should be given for compliance, health education, fear of side-effects, motivation/promotion measures, and community participation. The implementation activities should be strengthened immediately in the MDA programme in India to achieve the goal of LF elimination.

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