



Evaluation of Mass Drug Administration for the Elimination of Lymphatic Filariasis in Dakshina Kannada District, Karnataka

Giriyantha Gowda¹, Sathish Chandra Mallapanalli Ranganatha²,
Rekha Srinivas³

Abstract

Background and Aims: Lymphatic filariasis (LF) is the most debilitating and disfiguring among all diseases. The National Health Policy (2002) had set the goal of elimination of LF in India by 2015. The concept of mass drug administration (MDA) is to approach every individual in the target community and administer an annual single dose of antifilarial drugs (diethylcarbamazine and albendazole).

Objectives: The objectives of this study were (1) to find the coverage and compliance of MDA at Dakshina Kannada district and (2) to assess the knowledge of responsible adult respondent regarding elephantiasis/filariasis and MDA program.

Materials and Methods: The present study was conducted to evaluate the coverage and compliance of MDA in Dakshina Kannada District which was held on January 23, 2012. The evaluation was conducted for 1 week by a team of investigators. A total of 232 houses were visited randomly in four clusters (1 in urban + 3 in rural area) covering of 982 beneficiaries between the age group of 2 and 60 years of age in pre-designed and semi-structured pro forma.

Results: The coverage of MDA was 84%, and compliance among those who received the tablets was 80.24%. There was marginally better coverage in urban areas (89.27%) compared to rural area (82.41%), and compliance was better in rural areas (87.94%) compared to urban area (63.18%). The coverage compliance gap which shows why people do not consume the tablet was 3.74%, and the effective coverage rate was 67.41%. The coverage was maximum, i.e., 91.3% in Kalladka (cluster 3) and minimum, i.e., 76.21% in Koila (cluster 2), whereas compliance was maximum, i.e., 90.73% in Koila (cluster 2) and minimum, i.e., 63.18% in Attavara (cluster 1).

Conclusion: The coverage and compliance rate in Dakshina Kannada district were 84.01% and 80.24%, respectively, with effective coverage rate of 67.41%. Awareness regarding MDA program was poor.

Keywords: Elephantiasis, lymphatic filariasis, mass drug administration.

Introduction

Lymphatic filariasis (LF) is an important vector-borne neglected disease caused by *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori* which is transmitted by *Culex* and *Mansonia* mosquitoes and characterized by disfigurement of limbs (elephantiasis) and genitalia (hydrocele) and other anatomical changes, and it often has adverse economic and psychosocial effects as well as medical consequences. It is a disease of poverty affecting the poorest of

the poor.

The current estimate reveals that 120 million people in 83 countries of the world are infected with LF parasites, and it is estimated that >1.1 billion people (20% of the world's population) are at risk of acquiring infection. Over 40 million people are severely disfigured and disabled by filariasis, and 76 million are apparently normal but have hidden internal damage to lymphatic and renal systems [1].

39 taluks in eight districts such as Bagalkot, Bidar, Bijapur, Dakshina

Kannada, Gulbarga, Raichur, Udupi, and Uttara Kannada are considered as endemic for filariasis. 13.28 million people are living in endemic areas (10.14 million in rural area and 3.14 million in urban areas). An estimated 0.85 million

individuals are infected with LF and 0.09 million people suffer from chronic forms of filariasis [2].

Dakshina Kannada district is having five taluks with a total population of 2,194,220. Of five taluks, three taluks, namely Mangalore, Bantwal, and Puttur, are endemic for filariasis. Around 226 people were infected and were suffering from LF and chronic forms of Filariasis (2011). In 2004, India launched an ambitious mass drug administration (MDA) program in seven districts. By 2007, the program was being implemented with either diethylcarbamazine (DEC) or a combination of DEC and albendazole in all 250 endemic districts. Thus, within a span of 10 years, treatment was made available to every individual in endemic areas. The positive impact of the program is evident; monitoring and evaluation suggest that

microfilariaemia levels have declined sharply in many implementation units, and

¹Department of Community Medicine, Kempegowda Institute of Medical Sciences, Bengaluru, Karnataka, India

²Department of Community Medicine, BGS Global Institute of Medical Sciences, Bengaluru, Karnataka, India

³Department of Health and Family Welfare.

Address of Correspondence:

Dr. Sathish Chandra Mallapanalli Ranganatha, Department of Community Medicine, BGS Global Institute of Medical Sciences, Kengeri, Bengaluru – 560 060, Karnataka, India. Phone: +90-9964205151.
E-mail: sathi.medico@yahoo.co.in

Table 1: Sociodemographic characteristics of study population

Character	Frequency (%)
Age	
43,587.00	71 (2.3)
41,791.00	152 (15.4)
15-60	691 (70.4)
>60	68 (6.9)
Religion	
Hindu	170 (73.28)
Muslim	52 (22.41)
Christian	10 (4.31)
Education	
Illiterate	151 (15.38)
Primary	204 (20.77)
Middle	221 (22.51)
High school	181 (18.43)
Intermediate/diploma	93 (9.47)
Graduate	119 (12.12)
Professional degree	13 (1.32)
Occupation	
Service	26 (2.65)
Business	43 (4.38)
Self-employed	86 (8.76)
Agriculture	95 (9.67)
Labor	168 (17.11)
Unemployed	25 (2.55)
Student	262 (26.68)
Housewife	277 (28.21)

some of which will be able to stop MDA in the near future. The government envisages achieving elimination by 2015 [1]. In Dakshina Kannada district, 8th round of MDA for the elimination of LF was held on January 23, 2012. In this context, a team of investigators conducted an evaluation of MDA program for 1 week with the objective to find the coverage and compliance of MDA and to assess the knowledge of responsible adult respondent regarding Elephantiasis/Filariasis and MDA

Table 2: Cluster wise distribution of the coverage of MDA

Details of Clusters	Tablets received	Male	Female	Total	Coverage (%)
Cluster: 01	Yes	130	128	258	89.27
Taluk: Mangalore Urban	No	13	18	31	10.73
Health Center: Attavara	Total	143	146	289	100
Cluster:02					
Taluk: Puttur	Yes	90	115	205	76.21
PHC: Koila	No	31	33	64	23.79
Village: Koila	Total	121	148	269	100
Cluster: 03					
Taluk: Bantwal	Yes	85	104	189	91.3
PHC: Kalladaka	No	5	13	18	8.7
Village: Shamboor	Total	90	117	207	100
Cluster:04					
Taluk: Mangalore rural	Yes	85	88	173	79.72
PHC: Attur Kemral	No	21	23	44	20.28
Village: Bijapur colony	Total	106	111	217	100

Mass drug administration

programme.

Materials and Methods

The present evaluation was conducted by a team of investigators for 1 week as per the guidelines of National Vector Borne Disease Control Programme (NVBDCP) by excluding children below 2 years, pregnant women, and persons with severely ill in 4 randomly selected clusters [3].

Three clusters from rural area were selected randomly based on the information provided by district authority on primary health center (PHC)-wise MDA coverage in the year 2011. All the PHCs were listed according to MDA coverage, from each taluk, one PHC was selected randomly by lottery method, and in the urban area, one ward was selected randomly by lottery method from the list of 60 wards. All the selected PHCs and health center were visited and collected information on MDA program. In PHC, list of subcenters and villages coming under its jurisdiction were listed, and a

subcenter and a village were selected randomly by lottery method for household survey. A total of 232 households (minimum 50 in each cluster) as per the NVBDCP guidelines were selected randomly and interviewed from responsible adult respondent between the age group of 18 and 60 years. Data were collected on sociopersonal characteristics, knowledge on elephantiasis/filariasis, MDA program, MDA coverage at household level, and

adverse drug reactions.

All the data were collected in a pre-designed and semi-structured pro forma [4], and the data obtained from the survey were analyzed using SPSS Statistics for Windows, Version 19.0., Armonk, NY: IBM Corp.

Results

Of 232 households (minimum 50 in each cluster), population covered with an eligible population of 982 (97.7%). Among them, majority were in the age group of 15–60 years, i.e., 691 (70.4%) followed by 6–14 years, i.e., 152 (15.4%). Majority, i.e., 73.28% were Hindus, followed by 22.41% of Muslims and 4.31% of Christians. Majority subjects, i.e., 221 (22.51%) were studied up to middle primary, followed by 204 (20.77%) primary and 183 (18.43%) high school. Majority, i.e., 277 (28.21%) were housewives and least being 25 (2.55%) unemployed (Table 1).

Among 982 subjects who received drugs, 825 had consumed the medications with a coverage rate of 84.01%. Among them, 662 had taken both DEC and albendazole leading to a compliance rate of 80.24% and remaining 139 (14.15%) had taken DEC only. Of 825 study subjects who took medications, only 7 (0.85%) developed mild-to-moderate adverse reactions which subsided itself without medical intervention (Flow Chart 1).

Comparison of coverage and compliance was done between urban and rural areas which showed marginally better coverage in urban areas (89.27%) compared to rural area (82.41%). However, compliance was

Table 3: Compliance rate, coverage-compliance gap, and effective coverage rate

Cluster	Eligible population	DEC and albendazole given by DD	Coverage rate (%)	Consumed	Compliance rate (%)	CCG (%)	ECR (%)	95% CI
Attavara	289	258	89.27	163	63.18	26.09	56.4	50.46–62.16
Koila	269	205	76.21	186	90.73	14.52	69.14	63.19–74.53
Shamboor	207	189	91.3	160	84.66	6.64	77.29	70.86–82.69
Attur Kemral	217	173	79.72	153	88.44	8.68	70.51	63.89–76.39
Total	982	825	84.01	662	80.24	3.77	67.41	79–83.9

DEC: Diethylcarbamazine, CCG: Care commissioning guidelines, CI: Confidence interval

better in rural areas (87.94%) compared to urban area (63.18%) (Table 2).

Cluster wise coverage

Shamboor village (cluster 3) has highest coverage rate of 91.30% with the compliance rate of 84.66%, coverage-compliance gap of 6.64% and effective coverage rate of 77.29% (95% confidence interval [CI] = 70.86–82.69). Koila village (cluster 2) has lowest coverage rate of 76.21%, compliance rate of 90.73%, coverage-compliance gap of 14.52%, and effective coverage rate of 69.14% (95% CI = 63.19–74.53). Overall, care commissioning guidelines (CCG) was 3.77% and effective coverage rate was 67.41% (95% CI = 79–83.9) (Table 3).

Of 171 (17.4%) who did not consume drugs, reasons for not consuming being 122 (46.39%) had fear of side effects followed by 60 (22.81%) who forgot to take the drugs and 22 (8.37%) who refused to receive the drugs (Table 4).

Investigator also collected among 232 adult responsible respondents, and only 26 (11.21%) were awareness about MDA program. About 207 (89.22%) were awareness of lymphedema cases in vicinity.

Discussion

The coverage and compliance of MDA in Dakshina Kannada district were 84% and 80.24%, respectively (compliance was derived from a total number of eligible population who received adequate dose of drugs) with an effective coverage rate of 67.41% which is less than national target of 85%. The evaluations conducted in Gulbarga district of Karnataka [5] and in Madhya Pradesh [6] observed that coverage was 32.7% and 53.2%, respectively. As per the WHO, MDA coverage in India was 84.05% in 2010 [2]. MDA coverage was marginally better in urban areas (89.27%) compared to rural area (82.41%), and compliance was better in rural areas

(87.94%) compared to urban area (63.18%) this deferred from the study done at Madhya Pradesh [7] which showed a coverage of 89% and 96.2% in urban and rural area with compliance of 77.8% and 92.9% in urban and rural area, respectively. In this context, many studies [8, 9, 10, 11] also found similar results.

Of 171 (17.4%) who did not consume drugs, reasons for not consuming being 46.39% had fear of side effects followed by 22.81% who forgot to take the drugs and 8.37% refused to receive the drugs. A study conducted in Orissa found that 25% of the eligible population were not swallowed the drugs [12]. Of 825 study subjects who took medications, only 0.85% developed mild-to-moderate adverse reactions which subsided itself without medical intervention; these findings were similar to study of Tikamgarh [7] who found that 0.6% had mild-to-moderate adverse reactions. It was observed that the most common reason for not consuming tablets was fear of side effects, but <1% had mild adverse reactions in similar studies. Information, education, and communication (IEC) activities and drug distributors should focus on removing the fear of side effects in the community. Overall CCG was 3.77% and effective coverage rate was 67.41% (95% CI = 79–83.9) which was similar to the study done by Singh et al., where CCG was 10.1% and electrocardiogram was 85.2% [7]. Only 11.21% of the responsible adult respondents were aware of the date of MDA before the program. Similarly, a study conducted in Orissa [12] observed that only 14% of them were aware of MDA before program. This may be due to poor IEC activities before the MDA program.

Table 4: Reasons for non-compliance to DEC and albendazole (n=171)

Reasons	Frequency (%)
Fear of side effects	122 (46.39)
Forgot to take	60 (22.81)
Refused	22 (8.37)
Aged >60 years	21 (7.98)
Hypertension	13 (4.94)
DM	9 (3.42)
Asthma	2 (0.76)
Others	14 (5.32)
Total	263 (100.00)

DEC: Diethylcarbamazine, DM: Diabetes mellitus

was observed that a significant number of eligible population was not covered under the program because of fear of side effects. A similar finding was observed in the study conducted in Gujarat [8]. Persons above the age of 60 years form a significant proportion of the total population (7.98%) which may act as a potential reservoir for microfilariæ and maintain the chain of transmission [13, 14].

Conclusion and Recommendations

The existing coverage and compliance in Dakshina Kannada district was 84.01% and 80.24%, respectively, with an effective coverage rate of 67.41% which is less than the target of 85%. National guidelines should focus on effective coverage rate instead of only coverage. Awareness regarding MDA program was poor even though 89.22% were seen elephantiasis cases in the community. Importance should be given for the IEC activities before the program using mass media such as television, radio, and newspapers.

References

1. World Health Organization. Data Progress Report 2000-2009 and Strategic Plan 2010-2020 of the Global Programme to Eliminate Lymphatic Filariasis: Halfway Towards Eliminating Lymphatic Filariasis. Geneva: World Health Organization; 2010. p.60-1.
2. National Vector Borne Disease Control Programme (NVBDCP). Annual Report. Karnataka: ROH & FW, NVBDCP, Bangalore; 2010.
3. National Vector Borne Control Programme. Operational Guidelines on the Elimination of Lymphatic Filariasis. New Delhi: Directorate General of Health Services, Ministry of Health and Family Welfare: Government of India; 2004.
4. National Vector Borne Control Programme. Elimination of Lymphatic Filariasis Training Manual on Mass Drug Administration and Morbidity Management. New Delhi: Directorate General of Health Services: Ministry of Health and Family Welfare: Government of India; 2004.
5. Ranganath BG. Coverage survey for assessing mass drug administration against lymphatic filariasis in Gulbarga district, Karnataka, India. *J Vector Borne Dis* 2010;47:61-4.
6. Lahariya C, Mishra A. Strengthening of mass drug administration implementation is required to eliminate lymphatic filariasis from India: An evaluation study. *J Vector Borne Dis* 2008;45:313-20.
7. Singh S, Patel M, Kushwah SS. An evaluation of mass drug administration compliance against filariasis of Tikamgarh district of Madhya Pradesh-a household-based community study. *J Family Med Prim Care* 2013;2:178-81.
8. Kumar P, Prajapati P, Saxena D, Kavishwar AB, Kurian G. An evaluation of coverage and compliance of mass drug administration 2006 for elimination of lymphatic filariasis in endemic areas of Gujarat. *Indian J Community Med* 2008;33:38-42.
9. Weerasooriya MV, Yahathugoda CT, Wickramasinghe D, Gunawardena KN, Dharmadasa RA, Vidanapathirana KK, et al. Social mobilisation, drug coverage and compliance and adverse reactions in a mass drug administration (MDA) programme for the elimination of lymphatic filariasis in Sri Lanka. *Filaria J* 2007;6:11.
10. Babu BV, Kar SK. Coverage, compliance and some operational issues of mass drug administration during the programme to eliminate lymphatic filariasis in Orissa, India. *Trop Med Int Health* 2004;9:702-9.
11. Ramaiah KD, Das PK, Appavoo NC, Ramu K, Augustin DJ, Kumar KN, et al. A programme to eliminate lymphatic filariasis in Tamil Nadu state, India: Compliance with annual single-dose DEC mass treatment and some related operational aspects. *Trop Med Int Health* 2000;5:842-7.
12. Cantey PT, Rao G, Rout J, Fox LM. Predictors of compliance with a mass drug administration programme for lymphatic filariasis in Orissa state, India 2008. *Trop Med Int Health* 2010;15:224-31.
13. Esterre P, Plichart C, Sechan Y, Nguyen NL. The impact of 34 years of massive DEC chemotherapy on *Wuchereria bancrofti* infection and transmission: The Maupiti cohort. *Trop Med Int Health* 2001;6:190-5.
14. Pichon G. Limitation and facilitation in the vectors and other aspects of the dynamics of filarial transmission: The need for vector control against anopheles-transmitted filariasis. *Ann Trop Med Parasitol* 2002;96 Suppl 2:S143-52.

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