



## A Community Based Study To Assess Impact of Mass Drug Administration for Lymphatic Filariasis Elimination And Patient's Compliance In Chindwara District of Madhya Pradesh.

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**ABSTRACT**

*Background-* Lymphatic filariasis is one of the oldest and most debilitating diseases known to humanity. Filariasis has been a major public health problem in India next to malaria. *Objective:-* evaluate coverage and compliance rate of Mass Drug Administration, Review of factors that influence individual compliance with Mass Drug Administration and to know the causes for non compliance. *Methodology:-* House to house cross-sectional study was carried out as per the standard guidelines and detailed questionnaire prepared by the National Vector Borne Disease Control Program during 2013 and 2014. *Results:-* A total 501 and 608 population was covered during survey in 2013 and 2014 respectively from 120 families in each year. Coverage rate were found 90.75% and 91.01% in 2013 and 2014 respectively. Total 299 and 362 persons were found who actually consumed tablet and compliance rate among them were 67.64% and 68.69% in 2013 and 2014 respectively. *Conclusion:-* In comparison to previous years there is improvement in 2014 but still there is need of strengthening in terms of logistics, IEC and health education efforts, supervised consumption, retraining of service provider before MDA activities, side effects and morbidity management, and to increase community participation.

**KEYWORDS :** Filariasis, DEC, Mass Drug administration, Vector born disease.

**Introduction**

Lymphatic filariasis is the world's second leading cause of long-term disability<sup>1,2</sup>. Filariasis is a global problem. It is a major social and economic scourge in the tropics and subtropics of Africa, Asia, Western Pacific and parts of the Americas, affecting over 73 countries. More than 1.4 billion people live in areas where there is a risk of infection, of which 120 million are infected and in need of treatment, including 40 million people with overt disease. According to the World Health Organization, India, Indonesia, Nigeria and Bangladesh alone contribute about 70% of the infection worldwide<sup>3</sup>. Although filariasis is not fatal, it causes debility and imposes severe social and economic burden to the affected individuals, their families and the community. The disease was recorded in India as early as 6th century B.C. by the famous Indian physician, Susruta in his book Susruta Samhita. Lymphatic filariasis is one of the oldest and most debilitating diseases known to humanity<sup>4</sup>. Filariasis has been a major public health problem in India next to malaria<sup>5</sup>.

Filariasis is the common term for a group of diseases caused by parasitic nematodes belonging to superfamily Filarioidea. The term "lymphatic filariasis" covers infection with three closely related nematode worms - *W. bancrofti*, *B. malayi* and *B. timori*. All three parasites have basically similar life cycles in man-adult worms living in lymphatic vessels whilst their offspring, the microfilariae circulate in peripheral blood and are available to infect mosquito vectors when they come to feed<sup>4</sup>. Of these, only *Wuchereria bancrofti* and *Brugia malayi* are found in India, transmitted by the ubiquitous vector, *Culex quinquefasciatus*, has been the predominant infection contributing to 99.4% of the problem in the country. The infection is prevalent in both urban and rural areas. The vector species breeds preferably in dirty and polluted water.

The majority of infections are asymptomatic, showing no external

signs of infection. Some of the infected individuals continue to harbor the parasite for many years without any sign and symptoms of disease. Filariae are responsible for a variety of clinical manifestations, including lymphoedema of the limbs or elephantiasis (skin/tissue thickening) of limbs, genital disease (hydrocele, chylodele and swelling of the scrotum and penis) and recurrent acute disease episodes and as many as 40% have renal involvement with proteinuria and haematuria. Such body deformities lead to social stigma, as well as financial hardship from loss of income and increased medical expenses<sup>5</sup>. People with the disease suffer pain, disfigurement, loss of work and sexual disability. Many men and women with visible signs of the disease are rejected by their families. The socioeconomic burdens of isolation and poverty are immense.

The Global Programme to Eliminate Lymphatic Filariasis (GPELF) launched by the World Health Organization (WHO) in 2000 with the goal of eliminating LF as a public health problem by the year 2020 is the largest public health intervention program attempted till date<sup>5</sup>. To achieve elimination of lymphatic filariasis, during 2004 the Govt. of India launched annual MDA with single dose of DEC tablets in addition to scaling up home based foot care and hydrocele operation. The co-administration of DEC+ Albendazole has been initiated since 2007. The coverage has improved from 72.4% in 2004 to 81.5% in 2013<sup>6</sup>. The present study was aimed to evaluate coverage and compliance rate of Mass Drug Administration, Review of factors that influence individual compliance with Mass Drug Administration and to know the causes for non compliance.

**Material and Methods:**

House to house survey was carried out for mid-term assessment of MDA of single dose of DEC in Chhindwara district of Madhya Pradesh. The study was cross sectional and did not involve patient intervention methods; hence, ethical issue does not arise, however Departmental

and ethical clearance was taken. The study was carried out in Chhindwara district of Madhya Pradesh in March 2013 and in August 2014. All the sampled eligible population in our study area. Exclusion Criteria: The eligible population did not include Pregnant women, children below 2 years, seriously ill persons, severely debilitated patient and people >60 years age.

**Study Technique:** The study was conducted as per the standard guidelines and detailed questionnaire prepared by the National Vector Borne Disease Control Program<sup>5</sup>. In every district, four clusters (three rural and one urban) of 30 households each were selected. For selection of rural sites, depending upon MDA 2008 coverage all Primary Health Centers (PHCs) of the districts was first stratified into 3 groups as: **1)** PHC with coverage below 50% **2)** PHC with coverage between 50-80% and **3)** PHC with coverage above 80%. In each category of the PHC, one PHC should be selected randomly. In case there is no PHC in a particular category, two PHCs from the next category may be selected. From each of the selected PHC, list of all villages were obtained and one village was selected randomly for household survey. In each village 30 households was covered. Similarly, in urban areas one ward was selected randomly for the evaluation of the program. In the selected ward 30 households is covered. In this way in each visit 120 households is surveyed for the purpose of MDA evaluation. An equal proportion of participants is selected from each block and included in the study. In total, eight villages and two urban wards were selected representing each administrative block. Secondly, the first household was selected as per the extended program for immunization (EPI) recommendation, and thereafter the fifth nearest household was selected to give a widespread coverage and adequate representation. All the eligible members of the household is interviewed about filaria and its associated morbidity, its transmission, information about MDA with DEC, Recommended dosage, Adverse reaction, and compliance. If someone was absent during the day of the interview, that person's information was not collected. The children below 12 years of age were not assessed for knowledge of Filaria. For those children who were not sure about MDA, the receipt and consumption of drugs, the information was ascertained from their mothers or any available adult family member who was aware of their consumption status. In Chhindwara district randomly selected Ward in Urban area was Ward No. 33 and No.21 and Randomly selected PHCs in Rural area was Bherdai village, Sausar, Seoni, Padurnablock; Haraei, Basuniakala Village, Sausar, Devi Village, Amarwara, Singoli Village.

**Definitions:** The working definitions adopted for drug coverage and drug compliance as per NVBDCP guidelines are as follows: *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 and is expressed as percentage. *Drug compliance:* It is the number of persons who ingested DEC in presence of a 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 and is expressed as percentage. *Coverage-Compliance Gap (CCG):* 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 × 100). For the purposes of this paper, coverage is defined as the percentage of targeted persons who receive MDA medications, and compliance refers to the percentage of a targeted population who swallow the medications.

**Data Collection Technique and Tool:** The predesigned questionnaire (provided by Director, Health Services, State Health Committee, and NVBDCP) was used for interviewed and information was collected regarding MDA activity.

**Field work:** House to House field Survey was carried out to collect information regarding consumption of DEC and other aspects of MDA coverage. Field work was completed in 4 days in each visit.

**Data Entry and Analysis:** Data was collected and compiled, entered in Microsoft Excel and Epi info 7.

## Result

A total 501 and 608 population was covered during survey in 2013 and 2014 respectively from 120 families in each year. Coverage rate were found 90.75% and 91.01% in 2013 and 2014 respectively. Total 299 and 362 persons were found who actually consumed tablet and compliance rate among them were 67.64% and 68.69% in 2013 and 2014 respectively. **Table no 1.** Age and sex wise distribution of coverage and consumption of DEC is shown in **Table no. 2.** It was shown that the best compliance was reported in the younger age group. **Table no. 3** Reasons for not swallowing or Non Compliance, the most common reason being people were not understanding the benefit of drug when people does not have disease symptoms.

**Discussion:** - Total 299 and 362 persons were found who actually consumed tablet and compliance rate among them were 67.64% and 68.69% in 2013 and 2014 respectively. Effective coverage, after taking into account the coverage and compliance, was less than the targeted coverage (85%) under the program. A high coverage (>85%) in endemic areas, which is sustained for 5 years, is required to achieve the interruption of transmission and elimination of disease in India<sup>7,8</sup>. However, higher coverage rate were also reported by other researchers<sup>9,10</sup>. The present study revealed a CCG of 31.30%. Lesser proportion of CCG (11%) was also reported<sup>9</sup>. Another study conducted in Madhya Pradesh reported CCG of 10.1%<sup>11</sup>. The difference might be due to adopting different study area

There was limited knowledge and awareness about LF and MDA amongst the community members. Similar findings have been reported from other studies in India<sup>12,13</sup>. There is an urgent need for more effective drug-delivery strategies that are adapted to local need. The proportion of non-compliance varied between 10.93% and 23.63% among different age-groups. In the present study, 31.30% of population failed to consume the drug even after receiving it, which was similar to that reported in another study<sup>9</sup>. Reasons for the failure of compliance as evident from the present study were people not feeling the necessity for consumption because they were healthy or did not have any symptoms, forget to consume due to busy work schedule, fear of side effects especially in case of children and poor awareness regarding the benefits of MDA. It was stated by drug distributors that they have visited each family only once to distribute the DEC. The present study revealed that drug distributors neither sensitized the community well in advance regarding the importance of the "Mass Drug Administration" nor the conducted MDA activities were found supervised in both the years, they just do it as protocol. Repeated contacts prior to the day of MDA may be required to increase the coverage. To cover the absentees and poorly covered areas, there is provision of 'mop-up' rounds but this activity has not been carried out to maximize the drug consumption. This indicates lack of supervisory activity for the programme. In majority of cases, the drug intake was not supervised. Similar findings were reported by other studies in India<sup>9,10,14</sup>. Basically the MDA program was found only restricted to the distribution of DEC and Albendazole tablets and issues like purpose of MDA activity, adherence to the drug schedule, fear of side effects, knowledge of the community regarding Lymphatic Filariasis and it's common preventive and control measures were not comprehensively addressed as evidenced from this study. Similar findings were observed by several other studies across India<sup>12,15</sup>. The important causes of non-compliance were inability of workers to cover entire population, non-supervised drug administration and fear of side effects. The tablets were distributed during the daytime when most people go out for work, so the drug distributors handed over the tablets to any member of the family for the whole family, leading to the insufficient coverage and reduced the compliance. Similar findings were reported in another study<sup>12</sup>. The time for the tablet distribution should be the evening or any day of vacation or festival to make it convenient for the community. In our study one of the reasons for low coverage is the high rate of migration of labourers. This group is often missed during MDA activities. The study from other part of India has also reported a similar problem<sup>16</sup>. A significant proportion of people did not state any definite reason for non consumption, indicating lack of felt need and motivation.

In our study, there is difference in compliance between males and females, as well as between the different age groups. This difference could be due to a higher literacy level and mobility among males as compared to the females. No doubt, awareness and education play

a crucial role in the elimination of filariasis<sup>17</sup>. In our study, the fear of side effects was not the major issue for poor compliance. Drugs were well-tolerated, and side-effects were negligible. Side-effects reported by other researchers were more or less similar as reported in the present study<sup>9,14,18</sup>. However, they also need to be addressed as they constitute as one of the cause of non compliance. Training program for health workers involved in MDA should emphasize more on how to ensure "On-the-Spot Swallowing" of tablets. A common understanding in the community is that drug is hot ("*dava garam hai, garmi karegi, isse garmi lagati he*") prevails in both urban and rural community. It was observed from the study that drug distributors hardly insisted on supervised 'on-the-spot' administration of drugs. Therefore, supervised drug intake was nil or poor in the area. Revisits of the houses were not undertaken in due to lack of human resources. There is an urgent need for more effective drug delivery strategies. Most respondents who consumed the drug took it after meal; this resulted in low compliance with drug intake. All these aspects can be taken care of by supervised "on-the-spot" DEC consumption and raising awareness regarding importance of MDA. People also raised the issue of distributing loose tablets. This implies that people have less faith in the government-supplied drugs. The awareness about the filariasis in the population studied is limited to the presence of the disease in the community and the surrounding areas. Most of the knowledge was due to the cases in their neighborhoods. There was distorted knowledge about the disease and MDA. The knowledge gap with regard to the disease and prevailing attitudes and perceptions toward the programme is one of the factors for lower compliance. Similar findings have been reported in other studies conducted in India,<sup>13,14,19,20</sup>. Among the causes non consumption; ignorance, mistrust, oblivion are the adjectives which recoil from time to time. People either don't know or don't understand the importance of MDA. Effective community participation and mobilization activities are essential to strengthen the people's knowledge and to change their perceptions regarding filariasis. The investigators probed for the participation of the community people in the programme. They think that it is only government responsibility for their health. There is need of intensive health education campaigns and strategy for community involvement should be made. A strong and efficient mechanism for faith and community participation should be generated. Lahariya and Mishra also noted similar findings with regard to community participation in their study<sup>12</sup>. Involvement of and coordination with other sectors, involvement of NGOs, school and college teachers, scout and guide / NCC candidates, local leaders, and self-help groups need to be emphasized.

#### Limitations

Successful implementation of MDA depends on various preparatory activities, such as selection and availability of health staff and/or volunteers, orientation and training of personnel, mobilization of resources, political commitment, advocacy, and social mobilization. However, in the present study, these components could not be assessed due to resource and time constraints.

#### Recommendations

1. Coverage may be increased by taking consideration the geographical **location** and accordingly the number of Health workers. **Time** selected for the MDA should shift to evening hours.

2. Efforts are needed to reduce CCG gap before increasing the coverage. It needs **motivating and sensitizing the community** about LF through intensive health education. Community needs to be sensitized about benefits of consuming drug. Topic related to health, filarial and MDA should include in the study curriculum of the students.

3. Health workers in general are performing near to the level of satisfaction. Unfortunately they are not been recognized and rewarded. DD hardly insisted on **supervised** "on-the-spot" administration of drugs. This issue can be addressed by strict supervision and immediate feedback. Government officers, Police officers, Bank employees, School teachers and specially Patients with filariasis residing in the community should be involved in such campaign.

4. Due emphasis must be given in training of DD on persuasion and assurance of side effect. The contents of the training should be **specific and target oriented**. Principle of 'need to know basis' should be followed. Mechanism to ensure the quality of the training should

be followed.

5. Many persons raised the issue of distributing loose tablets. This can be explained by the health workers that it will reduce the cost of the medicine without affecting the quality and other option in this context is to accept the **concept of Branding**. Branding of DEC and Albendazole is going to represent the value of medicines competently and proficiently. The 'unique name' will remain in the conscience/memory of the consumers and indirectly will inspire them to accept tablets by connecting them to product emotionally. A tag line with product also depicts the seriousness and loyalty of the system and will assure about the credibility. The brand will also stimulate the 'need' in the consumers by stimulating the curiosity among them. This curiosity will provoke them to understand about the brand. Thus branding can be considered as fundamental piece of marketing communication in the community.

**Conclusion:** - In comparison to previous years there is improvement in 2014 but still there is need of strengthening in terms of logistics, IEC and health education efforts, supervised consumption, retraining of service provider before MDA activities, side effects and morbidity management, and to increase community participation. Up to November 2014, twenty six districts (8 in Tamil Nadu, 5 in Assam, 4 in West Bengal, 2 in Goa, 3 in Maharashtra, 1 each in Karnataka, Puducherry, Odisha and Daman & Diu) have successfully completed Transmission Assessment Survey (TAS) and stopped MDA. The lessons from their strategy should be used to derive the solutions for the MDA programme as the ground situation in different parts of India is almost similar, wherever LF is endemic. An effective health education campaign to make the community aware about filariasis and increase their multilevel participation in the programme is essential to achieve desired success. The implementation of the programme can be improved by making more efficient microplans, increasing number of health worker, ensuring improved supervision, emphasizing the proper training of workers and supervised 'on-the-spot' DEC consumption, ensuring proper follow-up and rational scheme should generate to capture feedback.

**Table 1: Coverage and Compliance of Mass Drug Administration: Two year Comparison**

Year of Survey	2013	2014
Families surveyed	120	120
Population surveyed	501	608
Eligible person in surveyed population	487	579
Persons received tablet	442	527
Coverage Rate	90.75%	91.01%
Person who Actual consumed tab	299	362
Compliance Rate	67.64%	68.69%
Compliance coverage gap	32.35%	31.30
Effective Coverage	61.39%	62.52%

**Table 2: Showing Age and Sex-wise Distribution of Coverage & Consumption of DEC**

2013							
Age Group (yrs)	Eligible population (a)	Tablets received (b)	No. of persons swallowed tablets (c)	Coverage % (b/a)	Compliance % (c/b)	Compliance coverage gap % [(b-c)/b]	Effective Coverage % (c/a)
2-5	17	14	10	82.35%	71.42%	28.57%	58.82%
6-14	39	34	22	87.17%	64.70%	35.29%	56.41%
>14	431	394	267	91.41%	67.76%	32.23%	61.94%
Male	254	241	161	94.88%	66.80%	33.19%	63.39%
Female	233	201	138	86.26%	68.66%	31.34%	59.23%
Total	487	442	299	90.75%	67.64%	32.35%	61.39%
2014							
Age Group (yrs)	Eligible population (a)	Tablets received (b)	No. of persons swallowed tablets (c)	Coverage % (b/a)	Compliance % (c/b)	Compliance coverage gap % [(b-c)/b]	Effective Coverage%(c/a)
2-5	29	24	17	82.75%	70.83%	29.16%	58.62%
6-14	63	55	36	87.30%	65.45%	34.55%	57.14%
8>14	487	448	309	91.99%	68.97%	31.03%	63.44%
Male	314	301	206	95.85%	68.43%	32.23%	65.60%
Female	265	226	156	85.28%	69.02%	30.09%	58.86%
Total	579	527	362	91.01%	68.69%	31.30%	62.52%

**Table 3: Reasons for not swallowing or Non Compliance: Two year Comparison**

Reasons for not swallowing or Non Compliance	2013		2014	
	No. of Persons	%	No. of Persons	%
Age (2 -5 Years)	2	1.40	5	3.03
Old age	6	4.19	6	3.63
I have no disease	59	41.26	67	40.60
He / She out of home	8	5.59	15	9.09
Not informed	7	4.90	4	2.42
Fear about taking tablets	12	8.39	11	6.67
Govt. tablets is not good	19	13.29	20	12.12
Due to previous side effects	10	6.99	9	5.45
Forget to take /Busy schedule	16	11.19	26	15.76
Having fever at the time of MDA activity	4	2.80	2	1.21
Total	143	100.00	165	100.00

**References:**

- EA Ottesen, BOL Duke, M Karam, K Behbehani. Strategies and tools for the control/ elimination of lymphatic filariasis. Bull World Health Organ 1997; 75: 491-503.
- Building partnerships for lymphatic filariasis — strategic plan. Geneva: WHO; 1999.
- Desai C. Et Al. "Awareness on Lymphatic Filariasis: An Initiative for Elimination." JPSBR 4.6 (2014): 347-50.
- WHO:[http://www.who.int/neglected\\_diseases/preventive\\_chemotherapy/Newsletter14\\_En.pdf](http://www.who.int/neglected_diseases/preventive_chemotherapy/Newsletter14_En.pdf)
- National Vector Borne Disease Control Programme. Lymphatic Filariasis. Available from <http://www.nvbdc.gov.in/doc/guidelines-filariasis-elimination-india.pdf>
- Govt. of India. Annual Report 2013-14,Ministry of Health and Family Welfare, New Delhi. 2014
- Malecela-Lazaro M, Twum-Danso N. 2.4 PROGRAM IMPLEMENTATION. The American Journal of Tropical Medicine and Hygiene. 2004; 71(5 suppl):16-9.
- Government of India. Operational guidelines on elimination of lymphatic filariasis. Directorate NVBDCP. New Delhi 2005.
- 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.
- Ravish KS, Ranganath TS, Riyaz Basha S. Coverage and compliance of mass drug administration for elimination of lymphatic filariasis in endemic arias of Bijapur district, Karnataka. Int J Basic Med Sci 2011; 2:86-89.

- Singh S, Patel M, Kushwah SS. An evaluation of mass drug administration compliance against filariasis of Tikamgarh district of Madhya PradeshA—a household-based community study. J Family Med Prim Care 2013;2(2):178-81.
- 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.
- Mukhopadhyay AK, Patnaik SK, Satya Babu P, Rao KN. Knowledge on lymphatic filariasis and mass drug administration (MDA) programme in filaria endemic districts of Andhra Pradesh, India. J Vector Borne Dis 2008; 45:73-5.
- Karmakar PR, Mitra K, Chatterjee A, Jana PK, Bhattacharya S, Lahiri SK. A study on coverage, compliance and awareness about mass drug administration for elimination of lymphatic filariasis in a district of West Bengal, India. J Vector Borne Dis 2011;48:101-4.
- Babu BV, Mishra S. Mass drug administration under the programme to eliminate lymphatic filariasis in Orissa, India: a mixed-methods study to identify factors associated with compliance and noncompliance. Tran R Soc Trop Med Hyg 2008; 102(12):1207-1213.
- Sunish IP, Rajendran R, Mani TR, Gajanana A, Reuben R, Satyanarayana K. Long-term population migration: an important aspect to be considered during mass drug administration for elimination of lymphatic filariasis. Trop Med Int Health 2003; 8: 316-21.
- Cantey PT, Rout J, Rao G, Williamson J, and Fox LM: Increasing compliance with mass drug administration programs for lymphatic filariasis in India through Education and Lymphedema Management Programs. PLoS Negl Trop Dis 2010, 4:e728.
- Haldar A, Mundle M, Haldar S, Biswas AK, Mitra SP, Mahapatra BS. Mass DEC campaign for filariasis in a hyper endemic district of West Bengal. J Com Dis 2001; 33(3):192-7.
- Rath K, Nath N, Shaloumy M, Swain BK, Suchismita M, Babu BV. Knowledge and perceptions about lymphatic filariasis: a study during the programme to eliminate lymphatic filariasis in an urban community of Orissa, India. Trop Biomed 2006; 23:156-62.
- Ramaiah KD. Lymphatic filariasis elimination programme in India: progress and challenges. Trends Parasitol 2009; 25:7-8.