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A study on assessment of mass drug administration for elimination of lymphatic filariasis in Datia district, Madhya Pradesh

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ABSTRACT

Background: Currently 947 million people globally live in areas having endemic lymphatic filariasis and require preventive chemotherapy to stop the spread of infection. LF is transmitted by many mosquitoes particularly *Culex* and in some areas by *Anopheles* and *Aedes* too. This study was conducted to assess the programme implementation with respect to process and outcome indicators and to assess the reasons for non-compliance among population.

Methods: We conducted a cross sectional study in Datia district, Madhya Pradesh during September 2014. We determined the sample size for survey based on standard guidelines for MDA coverage assessment. We identified four separate clusters, each with thirty households, for the survey. We selected three clusters from rural areas and one cluster from urban area to ensure adequate representation. We used stratified sampling technique for selection of three rural clusters.

Results: We surveyed 859 study participants of Indergarh block, Datia district, residing in 120 households across four clusters. Among 859 study participants, the eligible population (excluding less than two year child and pregnant females) was 92% (790/859). District health authorities reported coverage of MDA across entire district to be 91%. We determined the distribution rate of DEC across all four clusters to be 84% (±9%). We identified highest drug distribution rate in Uchad (97%; 193/200) and lowest in Bargai (75%; 133/178).

Conclusions: Non-compliant individuals are potential reservoir for the parasite which may serve as source of infection and transmission even after the mass drug administration ceases. As the prevalence of lymphatic filariasis continues to decrease with the implementation of control measures, addressing the issue of non-compliance holds primary importance to further substantiate the effect of our efforts.

Keywords: Lymphatic filariasis, Wuchereria bancrofti, Elimination, Diethylcarbamazine

INTRODUCTION

Lymphatic filariasis (LF), a neglected tropical disease, is caused by infection from *Nematodes* (roundworms) particularly *Wuchereria bancrofti*, *Brugiamalayi* and *Brugiatimori*. First two of these nematodes are commonly found in India¹. Currently 947 million people globally live in areas having endemic LF and require preventive chemotherapy to stop the spread of infection. LF is

transmitted by many mosquitoes particularly *Culex* and in some areas by *Anopheles* and *Aedes* too. The global programme to eliminate LF began its first mass drug administration (MDA) campaign in 1999 after the 50th World Health Assembly resolved that LF should be eliminated as a public health problem.² World Health Organization (WHO) mainly focuses on 2 point strategy to move towards control and elimination of the disease. Chemoprophylaxis of people living in endemic area in

¹National Centre for Disease Control, Delhi, India

form of mass drug administration (MDA) forms the mainstay of progress towards elimination of the disease. In 2000, WHO launched the global programme to eliminate lymphatic filariasis (GPELF) which in 2012, reconfirmed the target date for elimination by 2020.³ Indigenous cases of LF are reported from about 250 districts across 15 states and 5 union territories in India.⁴

National filaria control program was launched in India in 1955 after a pilot project in Orissa from 1949 to 1954. Annual MDA of diethylcarbamazine and albendazole tablets for 5 years or more to all population (except pregnant women and children less than 2 years) in endemic areas to interrupt transmission of disease has been the mainstay of implementation strategies under the programme since 2004. The Ministry of Health & Family Welfare approved the use of combination of DEC and albendazole (400 mg) in September, 2006.

In India, the coverage has risen from 72% in 2004 to 87% in 2014 with reduction in microfilaria rate from 1.2% in 2004 to 0.4% in 2014. In the state of Madhya Pradesh, MDA coverage has raised from 74% in 2004 to 91% in 2014⁷.

The annual round of MDA is observed as National filaria day each year since 2004. Madhya Pradesh adopted MDA strategy for elimination of LF in 2004 with the first annual round of MDA carried out on June 05, 2004. Evaluation of activities conducted during the annual round has been an integral component of the strategy. Datia district in Madhya Pradesh is one of the endemic districts for LF. The annual round of MDA was held on September 14, 2014. House to house administration of DEC (6 mg/kg) and Albendazole (400 mg) was carried out by drug distributors in the endemic districts.

Evaluation of the activities carried out on National filaria day was done in Datia district with the following objectives:

- 1. To assess the programme implementation with respect to process and outcome indicators.
- 2. To assess the reasons for non-compliance among population.
- 3. To make recommendations based on the findings.

METHODS

We conducted a cross sectional study in Datia district, Madhya Pradesh during September 2014. We determined the sample size for survey based on standard guidelines for MDA coverage assessment. We identified four separate clusters, each with thirty households, for the survey. We selected three clusters from rural areas and one cluster from urban area to ensure adequate representation. We used stratified sampling technique for selection of three rural clusters.

We divided the area under primary health centres (PHC) of the entire district into three strata based on the coverage of mass drug administration: PHC with coverage less than 50%; coverage between 50-80%; and coverage more than 80%. We selected one PHC defined area using simple random sampling (using random number generated by Microsoft excel) within each stratum. If there was no PHC in a particular stratum, two PHCs were selected from the next higher stratum. We selected one ward from the list of wards using simple random sampling (using random number generated by Microsoft excel) to identify the urban cluster for the survey. We surveyed 120 households across four clusters. Three identified rural clusters include Bargai, Badoi and Uchad and one identified urban cluster included ward 1. Indergarh.

We used a pre-designed interviewer- administered multiple response close ended structured questionnaire as the data collection instrument. We collected data by active house-to-house surveys. In-depth interviews were conducted with the district malaria officer, frontline health workers, community leaders, and non-compliant individuals.

We used three process indicators for assessment of coverage of mass drug administration (MDA) of di-ethyl carbamazine (DEC): coverage; drug compliance/ingestion; and effective coverage of MDA. Coverage of MDA was calculated as the proportion of eligible population in a community that was given the drug. We determined the coverage based on reports procured from district health officials. In case coverage was unavailable with district health officials, the data was collected from community health worker (auxillary nurse midwife) of the concerning cluster.

We calculated drug compliance/ingestion rate as the proportion of population who ingested the drug among those who were distributed the drug. We excluded population less than two years of age and pregnant females among the surveyed population to determine the eligible population in the cluster. We calculated the effective coverage of MDA as the proportion of population who ingested the drug among the eligible population.

We identified the reasons for non-compliance from all individuals who received the drug but did not ingest it. We identified reasons based on literature review and standard guidelines and included lack of awareness, fear of side effects, improper counseling, and unavailability of person during distribution, among others in the questionnaire. We compiled and analyzed data to calculate proportions and summary statistics in Epi Info version 7.

We collected information about the information education and communication (IEC) materials such as pamphlets, banners, wall paintings, etc. distributed across the district from the district health officials. We observed the IEC materials used and displayed in and around the clusters at health facilities, bus and railway stations, and shopping and religious places.

RESULTS

We surveyed 859 study participants of Indergarh block, Datia district, residing in 120 households across four clusters. Among 859 study participants, the eligible population (excluding less than two year child and pregnant females) was 92% (790/859).

District health authorities reported coverage of MDA across entire district to be 91%. We determined the distribution rate of DEC across all four clusters to be 84% (±9%). We identified highest drug distribution rate in Uchad (97%; 193/200) and lowest in Bargai (75%; 133/178).

We calculated the drug ingestion or compliance rate based on recall as 77% (± 11%), highest in Uchad (89%;

171/193) and lowest in urban Indergarh cluster (65%; 105/162).

We determined the average effective coverage among population surveyed as 65% (±16%). The effective coverage was lowest (52%; 105/202) in urban cluster, Indergarh whereas highest (86%; 171/200) in rural cluster Uchad (Table 1).

We identified fear of side effects (36%; 53/148) and lack of awareness about the disease/treatment (23%: 35/148) as the most common reasons for non-compliance (Table 2).

The IEC material procured and distributed across district included 400 banners, 400,000 appeals and hand bills and 500 caps. Loud speaker announcement (one time) and print information in local newspaper was carried out in all four blocks of the district. The wall paintings regarding mass drug administration of DEC and LF were found only in government health facilities in the selected clusters. No wall paintings or banners were observed at religious areas, bus stands or railway station.

Table 1: Drug distribution, compliance and effective coverage of MDA across four clusters, Datia district, 2014.

	Total population surveyed	Eligible population		Drug distribution rate		Drug ingestion (compliance)		Effective coverage
	(a)	(b)	(a/b) (%)	(c)	(c/b) (%)	(d)	(d/c) (%)	(d/b) (%)
Indargarh (Urban)	216	202	94	162	80	105	65	52
Bargai	190	178	94	133	75	95	71	53
Badoni	221	209	95	174	83	143	82	68
Uchad	232	200	86	193	97	171	89	86
Total	859	790	92	662	84	514	77	65

Table 2: Reasons for non-compliance with MDA drive, Datia, 2014 (n=148).

Reason for non-compliance	Number	%
Fear of side-effects	53	36
Lack of awareness	35	23
Other/miscellaneous	26	18
Absent at time of drug distribution	13	9
Forgot to take the drug	14	9
Improper counseling	7	5

DISCUSSION

Even with scaled efforts towards elimination of LF, the average effective coverage of the mass drug administration in Datia district remains 65%. The greater disparity between coverage as reported by district authorities and as determined by the survey comes as a check and emphasizes on the gaps in the system. Effective coverage was found to be lower in urban areas as compared to rural areas. Similar pattern was found in other parts of the country as well.8

One of the main reasons of non-compliance to the drug was found to be fear of side effects. Same reason was found in Bankura district, West Bengal and was consistent with another study conducted in northern Brazil where the fear of side effects was a concerning cause among the non-compliant population.8,9 Noncompliance is shown to have different reasons among males and females. Another study conducted in Haiti found that lack of awareness about the disease, its control program and the medication was primary cause of noncompliance. 10

Lack of awareness about the disease and its control can be attributed to suboptimal IEC activities as observed in the community. The IEC activities carried out by the district health authorities showed little information to make community aware of the possible side effects of the drugs.

Due to limited scope of our study, detailed information about the non-compliant individuals was not captured in our study which limits our understanding of specific reasons in a particular gender, age or religion/caste groups and hence prevents us to target our actions for improvement. We recognize recall bias as a potential limitation of the study design as study respondents do not tend to remember once-a-year administration of drug with limited IEC activities, particularly if counseling regarding the drug is poor.

CONCLUSION

Non-compliant individuals are potential reservoir for the parasite which may serve as source of infection and transmission even after the mass drug administration ceases. As the prevalence of LF continues to decrease with the implementation of control measures, addressing the issue of non-compliance holds primary importance to further substantiate the effect of our efforts. We recommend further research for identifying the causes pertinent to non-compliance specific to communities. We recommend emphasizing the importance of drug distribution with administration under supervision to community health workers, voluntary workers and community leaders, with particular efforts in counseling of the beneficiaries regarding the disease, its treatment and the side effects of the drugs, to ensure drug compliance. Efforts are needed, in terms of political will, commitment of governmental and non-governmental organizations, and the staff at all levels, to make progress towards control of LF as a public health problem.

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Institutional Ethics Committee

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