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Coverage Evaluation Survey of Mass Drug Administration for Lymphatic Filariasis in Purbabarddhaman District, West Bengal

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Abstract:
Background: *Lymphatic Filariasis (LF) is the world's second leading cause of long-term disability. Mass Drug Administration (MDA) is the adopted strategy for elimination by which every individual is to be administered an annual single supervised dose of anti-filarial drugs. This process is to be repeated every year for ≥five years with ≥85% actual drug compliance. After last round of MDA in Purba Bardhaman district (2017-18), a coverage evaluation survey was conducted with objectives to assess coverage and compliance, reasons for non-compliance, side effects experienced, awareness about MDA and the constraints in implementing.* ***Materials and Methods:*** *A cross-sectional study was conducted in three villages and one ward of PurbaBardhaman district, selected by multi stage random sampling. In-depth-interviews of MDA implementing stakeholders were done. Data collected by house to house visit using pre-designed schedule.* ***Results:*** *Total 128 households were surveyed consisting of 606 eligible populations. Distribution coverage, compliance, effective coverage and effective supervised coverage were 83.7%, 87.6%, 73.3% and 27.7% respectively. Effective coverage and compliance were lowest in individuals having ≥15 years age. Effective supervised coverage was below 50% in all four clusters. Commonest reason for non-compliance elicited was 'fear of side-effects' (43.8%) and commonest side effect experienced was dizziness (43.3%). 57.03% households were aware about MDA. Extract of interviews with various stakeholders showed lack of dedicated micro-planning, inadequate Information-Education-Communication activities, inadequate community mobilization and knowledge gap of health workers.* ***Conclusion:*** *For successful implementation of MDA, participatory programme implementation planning, coordinated awareness generation and operational research focusing on important aspects is warranted.*

Keywords: *Coverage Evaluation Survey, Lymphatic Filariasis, Mass Drug Administration, PurbaBardhaman*

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I. Introduction

Lymphatic Filariasis (LF) is caused by parasitic nematodes belonging to superfamily Filarioidea that live in the human lymphatic system.[1] LF is the world's second leading cause of long-term disability as it results in loss of approximately five million Disability Adjusted Life Years (DALYs) annually.[1]Out of the 81 LF endemic countries, India along with Bangladesh, the Democratic Republic of the Congo, Indonesia, and Nigeria accounts for approximately 70% of the globalburden.[1,2] LFis endemic in 256districts of 15 states and five UTs of Indiawith about 650 million populations at risk.[3]

In 1997, the World Health Assembly called upon Member States to develop national plans to eliminate LF.[2] In 2000, the WHO established the Global Programme to Eliminate LF (GPELF) with the goal of eliminating it by 2020.[4]Elimination of LF (ELF) Programme waslaunched in India during 2004 and the National Health Policy (2017) has set the goal of Elimination of LF by 2017.[1, 5] Elimination of LF is meant that 'LF ceases to be a public health problem, when the number of microfilaria carriers is less than one per cent and the children born after initiation of ELF are free from circulating antigenaemia'.[1] The two strategies adopted for ELF in accordance to the global strategies are (i) annual single dose Mass Drug Administration (MDA) with Diethylcarbamazine citrate (DEC) and Albendazole tablets to all eligible at-risk population of the endemic districts to interrupt disease transmission, and (ii) morbidity alleviation by promoting home based management of lymphoedema cases and up-scaling of hydrocele operations in identified health care delivery institutions.[1, 3, 6] The concept of MDA is to approach every individual in the target community and administer annual single supervised dose of anti-filarial drugs by door to door visit supplemented with drug administration at booths and groups preferably on a single day with two-day mopping up operations, instead of mere distribution of drugs. To

interrupt transmission, this process is to be repeated every year for a period of 5 years or more aiming at minimum 85% actual drug compliance.[1]

In India, progress of ELF programme is reflected in the increase of MDA coverage from 72.42% in 2004 to 88.96% in 2015; and reduction of overall Microfilaria (Mf) rate from 1.24% in 2004 to 0.29% in 2015.[6]During 2013, about 223 districts have reported overall Mf rate of less than one per cent. During the same year, 12out of 20 districts (before bifurcation of Cooch Behar, Darjeeling, Paschim Medinipur and Bardhaman) of West Bengal were LF endemic,out of which threehad Mf rate more than one per cent which includes Bardhaman district(Bardhaman district was bifurcated into Purba and Paschim Bardhaman on 7th April 2017).[7, 8, 9]

According to the programme guidelines, after each round of MDA, post MDA assessment is to be done as the districts having observed minimum five rounds of MDA with more than 65% coverage of total at-risk population will be subjected for Transmission Assessment Survey (TAS).[10]Post MDA assessment is necessary to determine the performance of the implementing units and to find out impediments if any to suggest appropriate rectifying measures. Coverage and compliance are the cruxes of the success of MDA strategy.[11]After the last round of MDA in PurbaBardhaman district during 8thto 13thJanuary 2018, a coverage evaluation survey was conducted with the objectives to assess the coverage and compliance with MDA, to identify the reasons for non-compliance, to find out the side effects experienced by the consumers, to assess awareness about MDA and to ascertain the constraints/problems in implementing MDA by in depth interview of some of the functionaries.

II. Materials and Methods

Study design and period: The study was mostly a coverage evaluation survey with a cross-sectional design, conducted from 5th to 7th February, 2018.Coverage Evaluation Surveys are population-based, probability surveys designed to provide an estimate of preventive chemotherapy coverage that meets precision needs and avoids the biases, as well as some of the errors that can affect reported coverage.[4]

Study area and sampling technique: The study was conducted in Purba Bardhaman district of West Bengal. As per the Government of India guideline for evaluation of MDA as a part of filariasis elimination programme, the present assessment was conducted in four areas (clusters) – three rural and one urban. Based on the reported coverage of district health authorities, the blocks/municipalities were categorised into three groups –high coverage (≥ 95%), medium coverage (90% to <95%) and low coverage (<90%) for this evaluation. One block was randomly selected from each of the high, medium and low coverage blocks. Then one Primary Health Centre (PHC) was randomly selected from each of the selected blocks. From each of the selected PHCs, one sub-centre and subsequently one village from each of the selected sub-centres were selected. While in the urban area, one ward was randomly selected from the municipality with lowest reported coverage. Thus the final study areas identified for assessment were three villages (i.e. Karui, Baneswarpur and Mohanpur) and one ward (i.e. ward no. 11) of municipality.

For Post-MDA Coverage Evaluation Surveys, it is recommended to include at least 30 households and 150 eligible subjects from each cluster (village/ward). The sampling units were households of the selected clusters and the units of enquiry were the eligible individuals in each selected households. While selecting the households for each cluster, the centre of the cluster was approached preferable at the junction of multiple roads. One road was randomly selected and on that road first household was selected randomly. Subsequently next households were selected having the nearest entrance to the previous one to reach at least 30 households. In some clusters more than 30 households were selected, to include 150 participants.

Study population: Study population includes all eligible individuals residing permanently in the MDA campaign area.

Eligible population: According to the guideline, eligible population for MDA does not include children less than two years of age, pregnant women and seriously ill persons.

Study tools and techniques: A pre-designed pretested semi structured schedule adopted from the recommended guidelines for conducting Post-MDA assessment was used for interviewing the study participants. Spot observation was made for detecting empty/ intact/ half-used medicine strips (if available). Along with the structured questionnaire, a qualitative assessment was also done in the form of in-depth interview of BMOH (Block Medical Officer of Health)/MO (Medical Officer), BPHN (Block Public Health Nurse)/PHN (Public Health Nurse), ANM (Auxiliary Nurse Midwife)/Supervisor, ASHAs (Accredited Social Health Activist) and municipality health personnel.

Method of data collection: At the beginning of the interview, the head of the household (HOH) or any responsible adult member was explained about the purpose of the study. All the members available at that moment were interviewed. Information about drug consumption of those who were absent at that time was obtained from either the head or any responsible adult member of the household. Awareness regarding the disease and its prevention was assessed from the HOH/any adult member. For exploring certain quality aspects of the MDA process, health care personnel at different levels were also interviewed in depth.

Study variables: Data were collected on drug distribution, consumption pattern (supervised/non-supervised consumption/non-consumption), side-effects experienced following consumption, awareness about MDA programme with source/s of information about the same. Distribution coverage was calculated as percentage of eligible population who has received the medicine. Effective coverage was calculated as percentage of eligible population who has consumed the medicine. Compliance was measured by computing consumption of medicines among those who received them, whereas effective supervised coverage/consumption indicated the percentage of eligible individuals consuming drugs under supervision out of total eligible population.
Ethical approval was obtained from the Institutional Ethics Committee of Burdwan Medical College. All the study participants were ensured about confidentiality and anonymity.
Data were assembled in Microsoft Excel 2010 and analyzed using SPSS 20 software. Results were shown in the form of percentages and projected as tables and figures.

III. Results

Finally, 128 households were surveyed consisting of 606 eligible populations. Out of 606 eligible individuals studied, most of them (79.7%) were aged ≥ 15 years while 6.6% were in the age group of 2 – 5 years. The mean (SD) age of the participants was 31.24 (18.46) years. Overall, 51.8% were males and the rest were females. Majority of them belonged to Hindu religion (62.4%) and general caste (31.2%).

Among the eligible subjects studied, 84.0% and 87.6% received DEC and Albendazole respectively. Four (0.006%) persons received only DEC and 22 (4.3%) subjects received only Albendazole. Out of total eligible population 83.7% received both the medicines whereas, 12.0% did not receive any medicine at all. Non receipt of both the medicines was least among 6-14 year children (8.4%) (Table 1).

Table no 1: Distribution of eligible population according to receipt of MDA medicines.*(n=606)*

Age group (in years)	**Medicines received**					
	DEC No. (%)	**DEC only No. (%)**	**Albendazole No. (%)**	**Albendazole only No. (%)**	**Both No. (%)**	**None No. (%)**
2 – 5*(n_1=40)*	34 (85.0)	0 (0.0)	35 (87.5)	1 (2.5)	34 (85.0)	5 (12.5)
6 – 14 *(n_2=83)*	75 (90.4)	0 (0.0)	76 (91.6)	1 (1.2)	75 (90.4)	7 (8.4)
≥ 15*(n_3=483)*	400 (82.8)	4 (0.008)	420 (87.0)	20 (5.0)	398 (82.4)	61 (12.6)
Total *(n=606)*	509 (84.0)	4 (0.006)	531 (87.6)	22 (4.3)	507 (83.7)	73 (12.0)

Figures in parentheses indicate specific row percentages.

While the overall coverage for only DEC and DEC with Albendazole were found to be 84% and 83.7% respectively, the overall effective coverage for the same were 73.9% and 73.3% respectively. The estimated overall compliance for only DEC and DEC with Albendazole were 88.0% and 87.6% respectively. Both the effective coverage and compliance were lowest in individuals having ≥15 years age. Only 168 out of 606 eligible individuals (27.7%) consumed both the drugs under supervision. Again the proportion of supervised consumption for DEC only and DEC with Albendazole was lowest (25.5% and 24.8% respectively) among the ≥15 years aged individuals (Table 2).

Table no 2: Coverage, Compliance, Effective coverage and Effective supervised coverage of DEC and both drugs (DEC + Albendazole) according to age group of eligible population. *(n=606)*

For DEC only								
Age group (in years)	**Eligible population (a)**	**Received * (b)**	**Coverage (b/a)**	**Consumed ** (c)**	**Compliance (c/b)**	**Effective coverage (c/a)**	**Supervised consumption (d)**	**Effective supervised coverage (d/a)**
2 – 5*(n_1=40)*	40	34	85.0	32	94.1%	80%	18	45.0%

6 – 14 *(n_2=83)*	83	75	90.4	69	92.0%	83.1%	31	37.3%
≥ 15*(n_3=483)*	483	400	82.8	347	86.8%	71.8%	123	25.5%
Total *(n=606)*	606	509	84.0	448	88.0%	73.9%	172	28.4%
For Both Medicines (DEC + Albendazole)								
Age group (in years)	**Eligible population (a)**	**Received * (b)**	**Coverage (b/a)**	**Consumed ** (c)**	**Compliance (c/b)**	**Effective coverage (c/a)**	**Supervised consumption (d)**	**Effective supervised coverage (d/a)**
2 – 5*(n_1=40)*	40	34	85.0%	32	94.1%	80%	18	45.0%
6 – 14 *(n_2=83)*	83	75	90.4%	68	90.7%	81.9%	30	36.1%
≥ 15*(n_3=483)*	483	398	82.4%	344	86.4%	71.2%	120	24.8%
Total *(n=606)*	606	507	83.7%	444	87.6%	73.3%	168	27.7%

**These include both who received only DEC and DEC combined with Albendazole*
***These include consumption of only DEC and DEC combined with Albendazole*

It was found that 64 participant did not consumed anyone or both the drugs, despite receiving them. Reasons for non-consumption were elicited for these subjects and the most frequent reason reported was *'fear of side effects'* (Figure 1). Although there was scope for multiple responses, all the respondents cited a single reason for non-consumption.

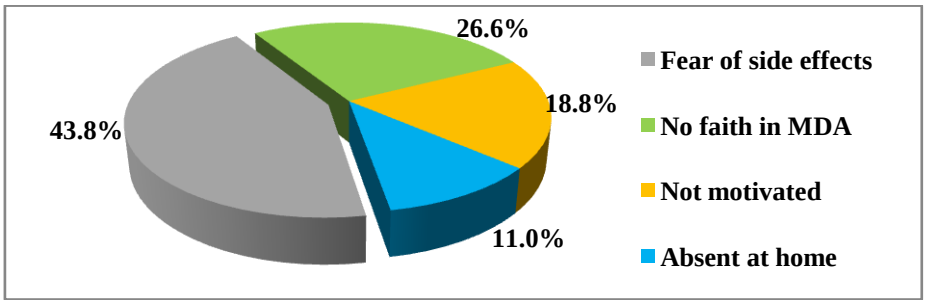

Figure no 1: Reasons for non-compliance. *(n=64)*

Out of 467 subjects who consumed drugs, only 30 (6.4%) persons experienced any side effect. The most commonly experienced side effects was dizziness (43.3%) followed by nausea, vomiting and headache (26.7%, 23.3% and 6.7% respectively).

Regarding awareness about MDA, respondents (i.e. either the heador other responsible adult member) of 73 out of 128 households (57.03%) surveyed were found to be aware about the reason for MDA, while only seven respondents knew the names of the medicines. The most frequent (80.82%; 59 out of 73) source of knowledge about MDA was found to be the field level health worker.

The salient issues and lacunae that came out after interpreting the findings of in depth interview conducted with the different stakeholders involved in implementing MDA activities were grouped into different categories for comprehension. These were;

(a) ***Planning:*** There appears to be lack of adequate and dedicated micro planning for undertaking the various activities of MDA at the block and sub-centre level.

(b) ***Availability of drugs and logistics*****:** The supply of drugs and logistics from district to different implementation unit was found to be adequate and timely.

(c) ***IEC activities*****:** Information communication by using loudspeaker was done only in one cluster but not in other three. Similarly, Banners, posters and leaflets were distributed in one cluster only.

(d) ***Community mobilization:*** There was no involvement of other sectors at the sub-centre/village level e.g. panchayet/NGO (Non-Government Organization)/teachers etc. as reported by some of the participants as well as grass root level workers. In the urban area studied, some of the household members did not get any information regarding the campaign, even not from health workers. *'I don't have any disease, why should I consume those medicines?'* was the response of some of the non-consumers.

(e) ***Monitoring/Supervision/Follow up:*** In most of the areas, supervised administration of the drugs was negligible. Majority of the health workers visited each household only once. Subsequent visits/mop-up

activitieswerenot done even if anybody was absent during first visit. Some of the study participants did not consume, as they were not instructed how to consume them.

(f) Knowledge gap of the health workers: Some participants also replied that they were instructed to consume the drugs at night, not under direct supervision. In some areas uncomplicated hypertensive patients and patients with even minor ailments were not provided with MDA medicines by the health workers.

(g) Other Issues: Albendazole as well as DEC were supplied as loose tablets in most of the study settings, which resulted in decreased acceptance. For adult persons total four drugs (three tablets of DEC and one tablet of Albendazole) needed to be administered at a time. This pill burden along with fear of side effect resulted in non-compliance in some instances.

IV. Discussion

The present Post-MDA CES was conducted three weeks after the MDA round was over in PurbaBardhaman district. The overall effective coverage estimated was 73.3% which below the recommended and expected target. Supervised consumption of medicines was done among less than 1/3rd of eligible population; a finding that is unsatisfactory and undesirable considering the recommended guidelines.

Study done by Roy et al. reported that the distribution coverage, compliance and effective coverage rates of MDA medicines during 2010 in undivided Bardhaman district were 48.76%, 70.07% and 34.16% respectively.[12] The findings of the present study definitely show improvement since then. A study done in a nearby district i.e. Bankura, by Halder et al. reported that the effective coverage rate was 56.20% during 2015 with 65% of consumptions were supervised.[13]In this present study although the effective coverage rate was higher but the supervised consumption was lower. Bhatia et al. found that very few people had ingested the drugs in presence of distributor in a study done in three districts of Madhya Pradesh during 2012, as many families reported that the distributors just provided the drugs without any information about timing and method of ingestion.[14]Basu et al. reported that only 4.7% consumptions were supervised in North 24 Parganas, West Bengal during 2015 and, the main reason for delayed consumption was found to be the instruction of consuming the drugs after meals (85.8%).[15]Findings of the present study also revealed that while most of the health workers visited each household only once, in many cases the consumption instructions were either not clear or improper. 'Fear of side effects' was the most frequent reason (43.8%) for non-compliance in this present study. Previous studies done, in Murshidabad(by Jha et al. in 2009) and Bankura (by Ghosh et al. in 2012) also found the same reason for non-compliance in most of the cases (47.4% and 54.3% respectively).[16, 17]These similarities in findings show that the issue of fear of side effects after consumption among general population is persisting over the years and also in different settings. As reported by Roy et al., in Bardhaman district 58% of the families were aware about MDA during 2010.[12]Present study showed that 57.03% households were aware about MDA. It indicates no progress over the years regarding awareness generation among general population about MDA programme. The underpinning reasons were explored by the extract of interviews with various stakeholders of MDA activities which showed lack of dedicated micro-planning, inadequate IEC activities, inadequate community mobilization and knowledge gap of health workers regarding MDA. The response of non-consumers that why should they consume medicines when they are not suffering from the disease indicated the failure of health workers to motivate them and make them understand about the need of consuming the medicine.

V. Conclusion

Drug distribution coverage was found to be optimum in the present study; howeverthe effective coveragewas far below the expected level particularly in Bhatar block and Dainhat Municipality. Supervised consumption of drugs was extremely poor. The most common reason behind non-compliance was fear of side effects followed by lackof faith. For successful implementation of MDA activities participatory programme implementation planning involving different stakeholders should be undertaken. To make communities more receptive to MDA, coordinated awareness generation activities using various channels and mediums of communication is required. Health workers have to work like a drug administrator rather than merely a distributor of the same. Timings of drug distribution should be properly thought out to ensure supervised consumption and reduce non-compliance. Operational research focusing on micro-planning, capacity building, drug delivery, compliance and other implementation issues should be conducted to strengthen the MDA activities, as it is the only effective strategy available to eliminate LF.

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Conflict of interest: Declared none.

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