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Coverage, compliance and bottlenecks of Mass Drug Administration Programme for eliminating Lymphatic Filariasis: Experience from North 24 Parganas, West Bengal

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Abstract:
Background*: The Mass drug administration is one of the main stays of Filaria Control in India. The endemic districts are covered by this MDA once every year with extensive microplanning, in one shot*.
Objectives: *the study was conducted to assess coverage and compliance to MDA, also to identify the factors for noncompliance and the bottlenecks of the programme*.
Materials and Methods: *A cross-sectional survey was conducted after completion of MDA for November, 2014 in three villages and one municipal ward of North 24 Parganas district of West Bengal, by multistage random sampling. Information was collected through interview of one responsible person from each family from those selected areas.*
Results*: Overall coverage and compliance were 95.9% and 83.9% respectively, though 100% consumption was unsupervised and 28.4% consumed the drugs later.Compliance was significantly higher in the rural cluster. Fear of the adverse reaction was the commonest (49.5%) cause of noncompliance.Only 45.5% had some idea about the reason of the drugs.*
Conclusion: *This study showed that the MDA coverage, though actually quiet high has further scope of improvement through more community participation, effective micro planning, supervision and monitoring.*
Key words*: Awareness, compliance, filariasis, mass drug administration, West Bengal.*

I. Introduction

Lymphatic filariasis (LF) is a worldwide prevalent and also potentially eradicable disease with an estimated 120 million people in tropical and subtropical areas of the world are infected with this. Approximately 66% of those at risk of infection live in the WHO South-East Asia Region. Of 72 countries listed by WHO as being endemic for lymphatic filariasis, 68 countries have completed mapping their endemic foci.[(1)]*Wuchereria bancrofti* as a causative organism accounts for over 90% of the global burden. India contributes about 40% of the total global burden. [(2)] In India,Lymphatic Filariasis (LF) is still endemic in 250 districts of 20 states / Union Territories in the country. States like Andhra Pradesh, Bihar, Gujarat, Kerala, Maharastra, Orissa, Tamil Nadu, Utter Pradesh and West Bengal contribute to about 95% of total burden [(2)].

In 1998, the WHO had targeted the elimination of this disease and formulated a Global Program on Elimination of LF (GPELF).[(3)] The basic features of this program are mass-drug-administration (MDA) with appropriate antifilarial drugs and morbidity management Since the launch of the programme, there has been consistent and steady increase in the number of countries implementing MDA from 12 in 2000 to 59 in 2010 with the total number of population treated under MDA from 2.9 million to more than 500 millions.[(1)] Accordingly, India's National Vector Borne Disease Control Program had scaled-up Several strategies for control of LF (i.e. antiadult measures , antilarval measures, IEC, observing "National filarial Day" [NFD]in the month of November).[(4)] Mass Drug administration (MDA) of antifilarial drug launched in 2004 by the Government of India, is a useful approach for elimination of LF. This newer strategy for elimination of Lymphatic Filariasis aims at breaking the chain of transmission through annual single-dose Mass Drug Administration (MDA) which reduces blood microfilaria by 99% when two drugs [Ivermectin + Diethyl Carbamazine Citrate (DEC) or Albendazole] are co-administered and by 90% when single drug (Ivermectin or DEC) is used[(5)] .During mass treatment, all the members of the community are given DEC except children under 2 years, pregnant woman and seriously ill patients. A high coverage (>85%) in endemic areas, sustained for consecutive 5 years, is required to achieve the interruption of transmission and elimination of disease.[(4)] A single dose Albendazole, combined with DEC is the current recommended drug regimen for MDA in West Bengal. After drug administration in North 24 Parganas district, Post MDA assessment survey was conducted by Department of Community Medicine, R G Kar Medical College, with the following specific objectives to assess

coverage of MDA and drug compliance among beneficiaries and to identify the factors for non-compliance to MDA.

II. Materials and Methods

The study was conducted during the months of November-December, 2014, (one month after the mass drug administration) in North 24 Parganas district of West Bengal. It was a Cross-sectional Coverage Evaluation Survey. As per reports, the blocks of the district were stratified into best, worst and medium performing units, according to Median Breakups. Then one block from each stratum was selected by simple random sampling technique. Similarly one municipality was selected randomly. In the next stage, one village from the selected subcenter of each block and one ward from the municipality was sampled randomly as the rural and the urban cluster, respectively, for the purpose of the study.Thus out of 22 blocks, Basirhat I (best performing, vill: Itinda), Habra (medium performing, vill: Tajpur), Haroa II (worst performing, Sonapukur) and out of 28 municipalities Khardah(ward no. 13) were selected. Finally, 30 house-holds from each village as well as from the selected municipal ward were selected.

From the three selected villages and the Municipality ward, total 134 households were surveyed covering a total population of 660 out of which 634 became eligible. All individual ≥2 years of age were included in the study, and pregnant women, severely ill persons were excluded as they did not consume the drug as per Government protocol. After selection of blocks and clusters, local health workers communicated for necessary cooperation. The head of the family or other responsible member present at the time of survey was interviewed with the help of pre-designed, pre-tested schedule. The schedule was translated into Bengali, and retranslated and checked by experts for Semantic equivalence. All the interviewers were trained to fill the schedule to increase the reliability of the study. Informed consent from all concerned was obtained and the Ethical clearance for the study as well. All the collected data were entered in MS Excel spread and presented through different tables and chart. The qualitative data were analysed using a transcript, then coding.

III. Results

The population involved in the survey were 182, 170, 140, and 168 beneficiaries from villages Itinda, Tajpur, Sonapukur and the ward no. 13 of Khardah municipality respectively. Out of 660 people surveyed, 634 (96.1%) were found eligible for MDA. The age of the participants mostly were in the age group ≥ 15 years (68.6 %) with 16.6 % in age group 6-14 years. The male to female ratio was more or less equal to 1 (1:1.06) having no significance difference across the age groups. (χ^2 = 0.21.df=2, p=0.899).

The head of the family were mostly educated upto primary level (38.8%) with 19.4 % illiterate. They were mostly Hindu (65.6%) belonging to general caste (63.3%) According to B G Prasad Scale(2013), they were mainly in Class II (48.4%), with Class III a close follower (24.2%).

Coverages of DEC in Itinda, Tajpur, Sonapukur and Kharadah were 97.1 %, 98.1 %, 100%, and 89.2 % respectively, with overall coverage being 95.9% and statistically significant lowest coverage in the urban area **(p<0.01)** compared to the highest coverage in Sonapukur.

Coverages of Albendazole in Itinda, Tajpur, Sonapukur and Kharadah were 96%, 99.4%, 100% and 89.2 % respectively with overall being 95.6%, and significantly lower coverage in municipal area **(p<0.01)** as well as Itinda **(p = 0.016)** compared to the 100 percent coverage in Sonapukur subcenter area. Statistically significant number of subjects reportedly received inappropriate MDA drugs at Khardah municipality and Itinda rural cluster compared to the Sonapukur rural cluster where 100 percent appropriate drug distribution was reported. Rural versus urban comparison clearly indicated the significantly lower coverage in urban area in respect of appropriate drug distribution [Chi-square 19.99, p <0.001 at df 1, OR=5.01(2.19-11.62)].83.9% of eligible population had taken both the drugs while 14.7% didn't consume both of the drugs as per the programme requirement.

Table 1: Distribution of non compliant households according to socio demographic characteristics of the head of the household (n=128)

Category	Number of family	Non compliant family (%)	X^2, p value	Odds Ratio (95% CI)
Head of the family's literacy level				
Illiterate	26	6 (23)	8.6 ,0.035	1 (reference)
Up to primary	33	14 (42.4)		2.5 (0.8-7)
Primary	48	8 (16.7)		0.7 (0.2 – 2)
Secondary/above (10 years or above)	21	3 (14.3)		0.6 (0.1 – 2.5)
Religion				
Hindu	84	25 (29.8)	4.09, 0.043	1 (reference)
Muslim	44	6 (13.6)		0.38 (0,49 – 9)
Caste				

General	81	15 (18.5)	6.3, 0.042	1 (reference)
Scheduled caste	46	15 (32.6)		2.13 (1.1- 5)
OBC	1	1 (100)		-
Socio-economic status the family (B G Prasad scale 2013)				
Class V	2	1 (50)	4.2 ,0.376	1 (reference)
Class IV	9	3 (33.2)		0.5 (0.02-11)
Class III	31	4 (12.9)		0.15 (0.01-2.8)
Class II	62	18 (29.03)		0.41 (0.02-6.9)
Class I	24	5 (20.8)		0.3 (0.01-4.9)
Total	**128**	**31(10.2)**	-	-

Compliant families are those families where all the members have consumed both the tablets after receiving them. Thus n= 128 as 6 families did not get the full course of the drugs.

From table 1 it is evident that Muslims are significantly more compliant than Hindus. The literate upto primary group shows better compliance than the other groups and there is no dose dependency seen here. The other variables also do not show a dose dependent relationship.

Table 2 shows the non compliant subjects (n=605). The non-compliants were mostly males (14.3 %), difference across the gender was found statistically insignificant. Non consumers of drugs were mostly of age group ≥ 15 years comprising of 77% of the whole non-compliance but the difference across the age groups weren't statistically significant. The predominant reason of non-compliance was found to be 'Fear of side effects' (49.5%) followed by "not necessary for healthy people" (22.6%). Only 4.3 % of the study subjects who had consumed MDA drugs and developed at least one adverse effect (AE) and amongst which nausea ranked on the top reported by 3.9 percent. However no one sought any medical care for the symptoms. Only 45.5% had some idea of why they are getting the drug, and 3.7% knew the names of both the drugs.

Table 2: Distribution of the non compliant study subjects as per gender and age group (n = 605)

Variable	Category	Non-compliant, No. (%)	Total No. (%)	p value
Gender	Male	44(14.3)	307	0.109
	Female	30(10.1)	298	
Age group	2 – 5	5(12.5)	40	0.998
	6 – 14	12(12.2)	99	
	≥ 15	57(12.2)	466	
	Total	**74 (37.6)**	**605(100.0)**	

None of the study subjects consumed drugs under supervision, 71.6% of the individuals who were given the drug took it on the same day, the rest consumed it later, the causes of delay being forgetfulness (76%), fear of side effects (41.5%), verifying with someone else (21.2%) and not at home (10.2%). The drugs were distributed mostly by ASHAs and in some cases by other workers.

IV. Discussions

DEC and Albendazole are required to be administered to >85% of the eligible population in the endemic districts to achieve the National Health Policy (2002) goal, but the present study demonstrates that though the drugs were distributed overall 95.9% as a whole and 83.9% consumed the drugs, the effective coverage is 81.2%, which is below the cut-off level (≥85 percent) for the programme requirement. This finding of coverage is in contrast to the findings obtained by Karmakar *et al*[6] (38.81%) and Halder *et al*[7](48.01%) from the same North 24 parganas district of West Bengal in the year 2010 and 2012 respectively but similar with another study conducted in Paschim Midnapur District where Sinha *et al*[8] found MDA coverage of 84.1% and 78.5% in 2009 and 2010 respectively. Another study from Sri Lanka[9] also reported a more or less similar (79.6%) coverage. Compliance in the present study was overall 85.2%. In their study in Andhra Pradesh Mukhopadhyay *e tal.*[10] reported 64.64% compliance. Sinha *et al*[8] mentioned 70.5% and 66.9% compliance in 2009 and 2010 respectively in Paschim Midnapur, West Bengal. Karmakar *et a*l[6] reported it to be 69.43% in their study.On the other hand, Offei M *et al*[11]found lower compliance (43.8%) in their study done in the year 2012 at Ghana.

The present study revealed that the consumption was significantly higher in the rural clusters and among the Muslim community (statistically significant) with no statistically robust difference across the gender and age groups. This is corroborative with the findings with Karmakar *et al.*[6] who observed that consumption rate was higher in rural area and was not different across the gender and age groups. In a similar study in the district of Bankura, West Bengal Ghosh *et al.*[12] reported significantly higher drug consumption in a rural cluster.

As per present study findings, all drug consumption remained unsupervised with a noncompliance rate of 11.2% and "fear of side effects" was reported as the commonest (49.5%) cause of noncompliance followed by

"not necessary for healthy person" (22.6%). High level of noncompliance was observed by Lahariya and Mishra.[13] Kumar *et al*.[14] also informed "fear of side-effects" as the main cause (80.6%) of non-consumption. In their study from Purba Medinipur, West Bengal, Chattopadhyay *et al*.[15] revealed "fear of side-effects" as the most common cause (41.5%) of noncompliance. Halder*et al.*[7] also reported high rate of unsupervised consumption (97.52%) with "fear of side-effects" being the commonest cause (63.02%).Ghosh *et al*[12]from Bankura,West Bengal also reported more than two-thirds of the families took unsupervised dose. In the present study only 45.5% had some idea of lymphatic filariasis but . Mukhopadhyay*etal*.[10] reported that 95% had heard about LF in a study conducted in Andhra Pradesh.Halder*et al.*[7]Ghosh*et al.*[12] also noted that two-third of the respondents heard about LF. Chattopadhyay*etal*.[15] also explored that 85.1% respondents were aware of filariasis. In the present study only 4.3 % respondents complained of side effects. Similarly Chattopadhyay *et al.* had found that only 2.0% complained of minor side effects. Halder*et al*[7]had also similar low finding. However study conducted in Leogane, Haiti, Overall, 24% (17,421) of the treated persons reported one or more adverse reactions.[16]

Low coverage and compliance in the urban area compared to rural areas in present study must be a matter of concern.Similar findings (the coverage and compliance were better in rural areas when compared to urban areas) were noted in several other studies from India[6, 7, 10, 13] and abroad[9]. The study from Sri lanka showed statistically significant poor coverage in Colombo city compared to peripheral districts.[9]

V. Conclusion

This study showed that the MDA coverage, though actually quite high, needs many more steps to reach its adulthood. The different component of the MDA programme like IEC activity including H-T-H visits by the ASHAs/DAs, intersectoral co-ordination, social mobilisation, timely supply chain of logistics, training of the Drug administrator (DA) etc. were found to have suboptimal functioning. And it might be the reason of suboptimal coverage of 81.2 percent.

It requires better political commitment and also community ownership with better monitoring, supervision and feedback from districts. With all these efforts, Filariasis, a Public Health Menace, may soon be reversed and controlled.

Some of the limitations were, it was done one month after the MDA, so recall bias was present. Also, a better representation by cluster sampling could have been done with more funds and time.

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