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Community Medicine

AN EVALUATION OF MASS DRUG ADMINISTRATION FOR ELIMINATION OF LYMPHATIC FILARIASIS IN BHANDARA DISTRICT OF MAHARASHTRA - A COMMUNITY BASED CROSS- SECTIONAL STUDY

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ABSTRACT

Background -The Government of India launched nationwide mass drug administration (MDA) in 2004 in endemic areas. The compliance has improved over a period of time, but intensive social mobilization would still be required to bridge the gap between coverage and actual consumption. Objectives: The present study was planned with the objective to evaluate the success of MDA programme in terms of coverage and compliance and to identify the reasons of non-compliance.

Methods -A community based cross sectional study in selected four clusters of Bhandara district was conducted through house to house survey and the outcome was assessed as the coverage and compliance of Mass Drug Administration.

Results: The surveyed coverage for distribution & consumption was 78.5% & 66.1% respectively. Insufficient distribution of drug was the most common reason reported for the non-consumption followed by improper counselling and absenteeism.

Conclusion: Every effort should be made to increase Coverage & consumption Rate.

KEYWORDS : Filariasis, Mass Drug Administration, Compliance

INTRODUCTION

Lymphatic filariasis is a vector-borne neglected tropical disease that causes damage of the lymphatic system and can lead to lymphoedema (elephantiasis) and hydrocele in infected individuals. The global baseline estimate of persons affected by lymphatic filariasis is 25 million men with hydrocele and over 15 million people with lymphoedema. At least 36 million persons remain with these chronic disease manifestations. The disease is endemic in 72 countries. In 2016, an estimated total population of 856 million were living in areas with ongoing transmission of the causative filarial parasites and requiring Mass Drug Administration (MDA). Lymphatic filariasis disfigures and disables, and often leads to stigmatization and poverty. Hundreds of millions of dollars are lost annually due to reduced productivity of affected patients. WHO has ranked the disease as one of the world's leading causes of permanent and long-term disability.

In 1997, the Fiftieth World Health Assembly resolved to eliminate lymphatic filariasis as a public health problem. The Global Programme to Eliminate Lymphatic Filariasis (GPELF) was launched by WHO in 2000 with the goal to achieve global elimination of the disease as a public health problem by 2020.[1]

In India, programme to eliminate lymphatic filariasis was launched in 2004 covering 202 endemic districts in 20 States/Union Territories and subsequently scaled up to cover all the 250 (now 255) endemic districts targeting a population of about 600 million[2].Effective monitoring and evaluation are necessary to achieve the goals of LF elimination.

Annual Mass Drug Administration with single dose of DEC was taken up as a pilot project covering 41 million population in 1996-97 and extended to 74 million population. This strategy was to continue for 5 years or more to the population excluding children below two years, pregnant women and seriously ill persons in affected areas to interrupt transmission of disease[2].

The population coverage during Mass Drug Administration (MDA) has improved from 73% in 2004 to 89% in 2015 which has resulted in the overall reduction of microfilaria rate from 1.2% in 2004 to 0.3% in 2015.[3]

Assessment of Mass Drug Administration is regularly done through Medical colleges to take corrective measures. Such assessments revealed that there is gap between coverage and actual compliance of drug. However, the compliance has improved over a period of time, but intensive social mobilization would still be required to bridge the gap between coverage and actual consumption so that the actual consumption rate of above 90% is achieved[2].

Therefore, the present study was conducted for the assessment of mass drug administration (MDA) activities of single dose of DEC administration in Bhandara district with the objective of

i. Checking the drug coverage within the study area.
ii. Check for coverage in the different age-groups (<2 years, 2–5 years, 6–14 years and >15 years) to determine whether any particular age-group is being left out.
iii. Check the reasons for the eligible population not taking the drug.

MATERIAL AND METHODS

The mass drug administration (MDA) activities had been conducted in Bhandara district in February 2017 followed by mopping up activities on two successive days. A single dose of DEC and Albendazole tablets was distributed to households by drug distributors who were health workers, anganawadi workers, accredited social health activists (ASHAs). The eligible population did not include pregnant women, children below two years of age and seriously ill persons[4]. An effective surveillance can help fulfil the aim of global elimination of LF as a public health problem[5]. The purpose of this survey in Bhandara district of Maharashtra state is to assess the coverage of Mass Drug Administration (MDA) of single dose DEC and Albendazole and to recommend mid-course corrections. This evaluation survey was conducted one week after the Mass Drug Administration (MDA) campaign over a period of five days by the team members of Indira Gandhi Government Medical College, Nagpur independently.

First, the baseline data of the district and coverage rate of Mass Drug Administration (MDA) distribution and compliance rate is collected from the District Malaria Office, Bhandara. The estimated population of Bhandara district as on 2017 was 11,57,088 and 10,80,403 of them were eligible for DEC administration. Stratified random sampling technique is adopted for selection of households. The PHCs are stratified into 3 groups depending upon Mass Drug Administration (MDA) coverage: those with coverage below 50%, between 50-80%, and those with coverage above 80%. In each category of the PHC, one PHC is selected randomly. In case there is no PHC in a particular category, two PHCs from the next category are selected. From each of the selected PHC, one village is selected randomly for household survey. In each village 30 households are covered. Similarly, in urban areas, one ward is selected randomly and 30 households are covered in the selected ward. In this way, in each district, 120 households are surveyed for the purpose of Mass Drug Administration (MDA) evaluation every year. As the reported coverage in all PHCs was above 80%, Of the 7 talukas of Bhandara district, three were selected for the survey, namely Bhandara rural, Mohadi and Tumsar. One primary

health centre (PHC) was selected from each taluka randomly. From the PHC's, one subcentre was selected and then one village from that subcentre was selected randomly from the list of subcentres and villages in the PHC's. Thus three villages with population of 3886, 1960, 4484 & one urban subunit with the population of 1,62,488 was selected randomly. A central point within the subunit through consultation with local residents, a pen was randomly spinned to select a direction of travel, all the households that fall along the line of travel in that direction starting from central point & finishing at the boundary of that area were numbered, sticking as closely as possible to the actual line of the direction of travel . A number was randomly selected between 1 the total number of households encountered along the direction of travel, and this was taken as the a "starting household", was randomly selected, all its members of starting household were interviewed and then contiguous 30 households was selected until the desired number of individuals has been interviewed. Once the data of all the eligible individuals in the selected household was collected, the next nearest household was selected. Parents or care givers answered for young children. The questions included whether the person was treated with antifilarial drugs or not, and if not, whether it was because they were not eligible. For those who were not eligible[4], the reason for ineligibility is recorded (e.g. age, pregnancy or illness). For those who were eligible but did not receive the dose, the reason for not having received the dose is recorded (including refusal, not knowing about the Mass Drug Administration (MDA), or because of other obstacles such as knowing about mass drug administration (MDA) but being in the fields, travelling or away at work)[6]. The coverage survey captured data on a sample of 513 individuals from all four clusters. Total 305 participants were present at the time of survey & were actually interviewed.

For the effective monitoring of Mass Drug Administration campaign, Drug coverage indicator is defined as the proportion of individuals who actually ingest the drugs. Two indicators are used to measure this: i) reported coverage and ii) surveyed coverage[5].

At the IU level, the data reported from all the drug distributors are compiled and termed the reported coverage. It is calculated on the basis of both the total population of the IU and the targeted, or eligible, population of the Iu[5].

The drug coverage in the targeted, or eligible, population is the best measure of how well Mass Drug Administration (MDA)s were implemented. An adequate level of programme drug coverage is estimated to be 80%[5] .

Surveyed coverage indicator is a measure that complements and verifies the reported coverage by using population-based cluster survey methods.

In the analysis, the denominator used for coverage is the number of eligible individuals residing in all the surveyed households about whom information on drug ingestion could be elicited & numerator used is total number of individuals identified by household survey as having ingested the drugs. Data was entered into a spread sheet and analysed. The results of the survey are presented as proportions. Chi-square (2) test was used to test the significance of difference between two proportions. Probability of <0.05 is considered statistically significant.

RESULTS

Demographic profile of the study population

A total of four clusters (one urban ward and three rural villages from Bhandara district) resulted in a total study population of 1,62,488 individuals. Data was collected from 497 beneficiaries (244 females and 253 males).

TABLE 1. Age & gender-wise distribution of beneficiaries in the evaluation of Mass Drug Administration (MDA)

Age (Yrs)	Male	Female	Total	%
2-5	12	16	28	5.5
6-14	20	33	53	10.7
15-59	167	162	329	66.3
≥60	45	42	87	17.5
Total	244(49.1)	253(50.9)	497	100

Table 1 depicts the basic characteristics of the study population. Majority of the respondents were in the age group of 15–59 years. The male and female distribution was more or less similar.

Coverage of DEC distribution & compliance

TABLE 2. Coverage of Mass Drug Administration (MDA) compaign at Bhandara district

Particulars	Village 1	Village 2	Village 3	Urban	Total
Total no. of beneficiaries in selected houses	129	137	109	122	497
Total no. of beneficiaries received drug	125	125	74	71	395
Total no. of beneficiaries consumed drug	101	106	63	62	332
Total no. of beneficiaries consumed drug in presence of drug distributor	94	98	33	53	278
Percentages of coverage (Effective Coverage Rate %)	96.9	91.2	67.9	58.2	78.5
Compliance Rate %	80.8	84.8	85.1	87.3	84.5
Coverage-Compliance Gap	16.1	6.4	-7.2	-29.1	-6.0
Percentages of consumption	93.1	83.1	51.6	74.6	66.1

Drug compliance assessment in table 2 shows that, total beneficiaries were 497. The surveyed coverage for DEC distribution was 78.5%. Subunit to subunit variation was observed for coverage of distribution ranging from 58.2% to 96.9%. 395 beneficiaries received drug and 332 consumed drug giving the compliance rate of 84.5%. Variation was also observed for consumption among different subunits ranging from 51.6% to 93.1% giving rise to the surveyed coverage for DEC consumption of 66.1% which was much less than the reported coverage by district health authority.

Reasons for Non-compliance

The rate of supervised consumption in the present study was 83.7 % (278 out of 332). Reasons for the low compliance rate were assessed & are shown in table 3.

TABLE 3. Reasons for not consuming DEC in Mass Drug Administration (MDA) compaign at Bhandara district

Reasons	No (N=165)	%
Did not receive tablets	102	61.8
Not present at home	39	23.6
Beneficiaries on empty stomach at time of DD's visit	22	13.3
Not Necessary	8	4.8
Fear of drugs	13	7.9
No info about LF/ Mass Drug Administration (MDA)/DEC	2	1.2
Complications of Previous Year's Mass Drug Administration (MDA)	1	0.6

The most important reason for not consuming DEC is that it was not distributed among 102 (61.8%) of them. The differences in the reported coverage by the district health authorities and the surveyed coverage in Bhandara district can be attributed to: (i) the drug distributors left behind drugs for household members who were absent (23.6%) during their visit and recorded it as having consumed, presuming that the absentees would take the drugs on their return. In two of the three rural clusters surveyed there was no mopping up activities carried out on the second and third day by the drug distributors. Those who had failed to ingest the drugs distributed on the campaign day were not identified and motivated to do so on the subsequent mopping up days; (ii) majority of the 15.9% of the persons who failed to consume the distributed drugs (63 out of 395) were children. The parents feared to give the drugs to their children. The drug distributors could have ensured that the children swallowed the

drugs in their presence. This would have reassured the parents; and (iii) the drug distributors did not ensure that the eligible people swallowed the drugs in their presence. 54 out of 332 did not have supervised drug consumption.(16.2%). Some of them had not food (13.3%) in the morning. Since the drugs were to be consumed after food, they forgot to take it later.

8 (1.60%) beneficiaries developed mild adverse reactions like fever & giddiness.

Source of information about Mass Drug Administration (MDA) activity was ANM, ASHA & previous year's activity. Beneficiaries consider that ANM followed by ASHA, anganwadi worker & doctors should be the drug distributor.

Demographic Factors influencing DEC Coverage in Mass Drug Administration (MDA) Campaign

TABLE 4. Age, gender & region-specific DEC coverage in the evaluation of Mass Drug Administration (MDA) campaign

Particulars	Eligible Population	Actually consumed tablet	Coverage	Chi-Square test	
Age (Years)	2-5	28	21	75.0	χ^2=0.5 df= 3 p=0.9
	6-14	53	35	66.7	
	15-59	329	213	64.9	
	≥ 60	87	63	72.4	
Gender	Male	244	166	68.0	χ^2=0.3 p=0.5
	Female	253	186	73.5	
Area	Rural	375	270	72.0	χ^2=3.9 p=0.4
	Urban	122	62	50.8	
Total	497	332	66.8		

Coverage was significantly better in among rural area compared to urban ward.(χ^2=3.9, P<0.05) and was similar among men and women (P>0.05).

DISCUSSION

Coverage surveys are a basic tool of programme management permitting the identification and correction of problems. This data can be used to assess the extent to which treatment was directly observed; coverage within the targeted, or eligible, population was achieved; non-compliant individuals exist. . The surveyed coverage in Bhandara district for DEC tablets consumption was 66.1% which was much less than the reported coverage by district health authority. The proportion of the eligible population who were distributed with DEC was reported as coverage rates whereas Drug coverage indicator as defined by WHO is the proportion of individuals who actually ingested the medicines[6]. The reported drug coverage should reflect the actual drug coverage, in some instances this is not the case. The reasons might be drug distributors left behind medicines for household members who were absent during their visit and recorded them as having been consumed presuming that the absentees would take the medicines on their return; in their enthusiasm to show good performance, drug distributors reported higher than actual coverage[6].

Annual dose is to be repeated every year for a period of 5 years or more aiming at minimum 85 % actual drug compliance[7]. The 66.1 % consumption rate was below the expected target. The surveyed coverage found in our population is same as Ranganathan BG[8], who found coverage rate of 61.1% & Ranganathan et al[9], who found coverage rate of 78% and compliance rate of 68% in Karnataka[9].

A study conducted by Shende[10] in Madhya Pradesh, who found that in Damoh district out of 488 person, 440 (90.2%) had consumed the drug while in Sagar district out of 634 person who received the drug, 463 (73.1%) had swallowed the drug which was higher than found in the present study.

A study conducted by Patel[10] in Karnataka observed that 79% in Bagalkot and 39% of the study subjects in Gulbarga district reported that they actually consumed tablets.

Kumar *et al*[12]. the coverage was 85.2% and compliance was 60% and it was seen that that DEC was received by 77% and taken by 64% of eligible people in the East Godavari District of Andhra Pradesh by Babu BV[13].

Adverse reactions among study population of Tikamgarh District of Madhya Pradesh by Sandeep Singh[14] were only 0.6%, which is negligible. The following adverse reactions noted were giddiness, vomiting, gastric irritation, etc., which were mild.

Only 33.8 (148/438) and 24.3% (105/432) were aware of the Mass Drug Administration (MDA) program in Bagalkot and Gulberga districts, respectively[11]. Where literacy is high mass media plays an important role as seen in Kerala but in areas with low literacy rates, health personnel play an important role in creating awareness among the public as demonstrated in our study and in Andhra Pradesh[15]

CONCLUSIONS AND RECOMMENDATIONS

In the study group, the coverage rate is 78.5% and the consumption rate is 66.1%. Coverage and compliance were marginally better in rural areas. Similar to other studies[7,11,12], the coverage and compliance were better in rural areas when compared to urban areas in present study. Hence, need special attention in urban areas during the Mass Drug Administration (MDA)

Main reasons for non-compliance were non-distribution of drug, beneficiary not present at visit of DD & beneficiary on empty stomach. DD hardly insisted on supervised "on the spot" administration of drugs; therefore, supervised drug intake was nil or poor and the commonest answer was "will take after meal". Efforts should be made to insist on "on the spot" consumption. This alone can bring down the coverage-compliance gap considerably.

refusal to taking drug for fear of side effects accounted for about 7.9% of noncompliance. Efforts are needed to reduce this gap by motivating and sensitizing the community through IEC.

Incidence of side effects after Mass Drug Administration (MDA) was minimal. All side effects were mild and no medical intervention was sought.

Various modes of pre- Mass Drug Administration (MDA) IEC can be utilized such as radio, TV, cable, newspapers, recorded messages or SMS (mobile or landline phones) and should be done just few days before the campaign regarding Mass Drug Administration (MDA) awareness for wide coverage and Mass Drug Administration (MDA) acceptance. Where literacy is high mass media plays an important role as seen in Kerala[17] but in areas with low literacy rates, health personnel play an important role in creating awareness among the public as demonstrated in our study and in Andhra Pradesh[16].

Interpersonal communication works best when there is one-on-one contact between the health worker and/or health communicator/health educator and the person whose behavior is sought to be changed to adopt new knowledge, life skills and practices to ensure the welfare of their families and children. One-on-one contact facilitates comprehension of new concepts and demonstration of new practices. Over a period of time, if done consistently, this method can result in adoption of new practices on a sustainable basis.

Some of the health system/policy-related issues like supplies and processes, involvement of midlevel health staff, separate strategies in urban areas, and community-related issues like comprehensive and timely IEC and community participation will help in achieving the desired coverage and compliance[12].

Six rounds of Mass Drug Administration (MDA), even with 54–75% treatment coverage, can reduce LF transmission very appreciably; also better treatment coverage and a few more rounds of Mass Drug Administration (MDA) may achieve total interruption of transmission[16]

Vector control would be used as an adjuvant to Mass Drug Administration (MDA) to prevent resurgences. The gains of the Mass Drug Administration (MDA)'s were sustained in combined treatment group (Group B), while resurgences occurred in Group A (only Mass Drug Administration (MDA)[17]

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