ORIGINAL ARTICLE

Coverage evaluation of Mass Drug Administration (MDA) for lymphatic filariasis in a district of Bundelkhand Region of Uttar Pradesh

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Citation

Article Cycle

Abstract

Introduction: Lymphatic filariasis results in severe disability that leading to severe social and economic burden at each level from individual to family, and community. This study was carried out to assess the coverage and compliance of MDA. **Methods**: From 300 households (1837 individuals) in both rural & urban area were covered in coverage evaluation survey by systematic selection of subunits using probability proportionate to size (PPS). Each household was visited by WHO designated team and data were collected using predesigned questionnaire. Data was compiled on MS-excel spreadsheet, frequency and percentage were calculated. **Results**: The overall effective coverage for all drugs was low (19.1%). The coverage was low, compliance was higher in urban as compared to rural area. Females had better coverage and compliance than males. The primary reasons for drug not offered was nobody came to offer drug, drug not swallowed was not sick, drug swallowed was useful information from drug administrator (DA). Only one female reported adverse effect. **Conclusion**: Increase in coverage along with decrease in coverage-compliance gap is needed to achieve filariasis elimination that warrants intense IEC activities using different platforms, development of better drug delivery strategies and strengthening monitoring system.

Keywords

Introduction

Lymphatic filariasis (elephantiasis), comes under neglected tropical disease. As per global baseline estimate 25 million men and 15 million people affected with hydrocele and lymphoedema respectively. In 2020, 863 million people in 50 countries were at risk of lymphatic filariasis. 72 (100%) of endemic countries must implement post-MDA or post-validation surveillance as per Global Programme to Eliminate Lymphatic Filariasis (GPELF) goals for 2030. The WHO recommends annual mass drug administration (MDA) preventive chemotherapy strategy for lymphatic filariasis elimination.(1)

Lymphatic filariasis (elephantiasis) is a serious public health problem in India. Lymphatic filariasis is prevalent in urban and rural areas of 256 districts of 16 states and 5 union territories. Highly endemic foci are present in several states, particularly Uttar Pradesh, Bihar, Orissa, Jharkhand and Andhra Pradesh. Lymphatic filariasis is more prevalent among urban poor and affects all segments of rural population. The infection starts in childhood and accumulates through adulthood, resulting in irreversible chronic disease conditions such as lymphedema, elephantiasis and hydrocele. The disease inflicts stigma, mental suffering, social deprivation and economic loss and is a major cause of poverty in the affected communities.(2)

The coverage evaluation survey was done to study the coverage and compliance of MDA to assist policy makers and programme managers in identifying positive aspects of implementation for consolidating them and issues, if any, to mitigate them in future campaign for better implementation of the programme.

Aims & Objectives

1. To estimate the coverage, effective coverage, and compliance of MDA in study area.
2. To estimate the reasons for non- offering, non-consumption, and consumption of MDA.

Material & Methods

Study design: The study was a community based cross-sectional study.

Study population: 1837 individuals belonging to rural & urban area of District Banda, Chitrakootdham Division of Uttar Pradesh.

Inclusion and exclusion criteria:
During this study all population living in survey area was included.

Study area: The coverage evaluation survey was done in Banda district according to the national guidelines of NVBDCP, for assessment of November to December 2021 round of MDA.

Sample size: The sample size was calculated using the help of the "*Sample Size Survey Builder*", available at http://www.ntdsupport.org/resources/coverage-survey-builder-coverage-evaluations. The formula adopted was:
Parameter required (n) - default value
1. Expected coverage (p) – 50%
2. Desired precision (δ) – 5%
3. Design effect (DEFF) – 4
4. Significance level (α) – 5% (Z = 1.96)
5. Non-response rate (*r*) – 15%

$$n = \frac{(\mathbf{DEFF})(\mathbf{Z^2}_{\alpha/2})(\mathbf{p})(\mathbf{1-p})}{\delta^2(\mathbf{1-r})}$$

Estimated Sample size (n)=1807
A total of 1837 persons (rural- 1719, urban- 118) covering 300 households (rural- 280, urban- 20) were checked for MDA coverage in present study.

Sampling method: Systematic selection of subunits was done. 30 subunits were randomly selected from within the survey area, using Probability Proportional to Estimated Size (PPES) sampling, and giving everyone in the survey population an equal probability of being selected. Within each subunit (e.g., village), a segment of households was randomly selected (typically ~ 50 household) for sampling efficacy, and to save time during data collection. Each subunit had different sampling intervals based on Probability Proportional to Estimated Size (PPES) sampling.

The coverage survey builder (CSB) generated two lists (List A and List B) to facilitate the selection of households within the segment, according to the sampling fraction. The CSB also generated random numbers on the list corresponding to the household numbers from which all individuals in the survey population were sampled.

Study Tool: The survey questionnaire was used which contains the minimum information required to assess MDA coverage. Basic demographic information such as age, sex and presence of family members at the time of interview was collected. The information on MDA drug offered and swallowed by the members of household were collected. The questionnaire also collected the information on reason for not offering the drug, reason for swallowing or not swallowing the offered drug and about adverse drug reaction happened after consuming the drug.

Operational definitions
Coverage: Percentage of no. of persons offered drug to no. of persons checked.
Effective coverage: Percentage of no. of persons swallowed drug to no. of persons checked.
Compliance: Percentage of no. of persons swallowed drug to no. of persons offered drug.

Data Collection: The data collection was done by WHO team. The team was trained by Zonal Coordinator, WHO on 21.12.2021. The data collection was done from 26.12.2021 to 29.12.2021. The data collector reached the subunit, introduced themselves and the purpose to the local influencers. A local guide was identified. The boundaries of the subunit were familiarized. The subunit was divided into the predetermined number of segments and one segment was randomly selected. The local guide helped to enumerate houses and identify a path through the segment. A coin was flipped to determine if List A or B was to be used. Through each segment the data collector walked the path through the segment, enumerating each HH. Each HH that corresponded to a number on the selected list (A or B) was included in the survey. All members of the survey population in each household were enlisted, and then each member on the list using the questionnaire was interviewed. This continued till all the households in the segment were enumerated.

Strategy to ensure data quality: The GPS system of mobile was used for more accurate identification and allocation of the subunits. For better supervision field supervisors were allotted for each data collector to observe the interview in a subset of households and back checks were conducted with the respondents to check validity of responses recorded by the data collector.

Data Analysis: Data was entered in MS Excel. Data cleaning was done to ensure data consistency before doing data analysis. Pivot tables were generated for analyzing results.

Results

Overall, coverage, effective coverage and compliance of albendazole was 53.6%, 26.5%, 49.3% respectively; for DEC it was 51.8%, 19.2%, 37% respectively and for all drugs it was 51.7%. 19.1%, 36.9% respectively. In rural

area, coverage, effective coverage and compliance of albendazole was 54.8%, 26%, 47.4% respectively; for DEC it was 53.5%, 19.1%, 35.7% respectively and for all drugs it was 53.3%. 19%, 35.6% respectively. In urban area, coverage, effective coverage and compliance of albendazole was 36.4%, 33.1%, 90.7% respectively; for DEC, all drugs it was 27.1%, 20.3%, 75% respectively. In both rural & urban area coverage, effective coverage and compliance was better in females as compared to males for all drugs. Adverse drug reaction (fever) was seen in only 1 rural female. (Table 1)

The most common reasons for drug not offered was nobody came followed by absent, underage etc, for both DEC & albendazole. (Table 2) The most common reasons for drug not swallowed was not sick, followed by not enough information given, fear of side effects, bad taste. (Table 3) The most common reasons for drug swallowed was Useful information from DA, others were fear of disease, to treat disease, because it was given free (Table 4)

Discussion

The study done by Kumar et al reported coverage, effective coverage and compliance of DEC was 90.9%, 79.9%, 87.9% respectively overall; 93.4%, 85.2%, 91.2% respectively in rural area & 83.8%, 65.4%, 77.9% respectively in urban area.(3) The study done by Bhue et al showed coverage, effective coverage and compliance of DEC was 87.2%, 82%, 94.1% respectively. (4)The study done by Nayak et al reported coverage, effective coverage and compliance of MDA was 94%, 88%, 93% respectively overall; 95%, 88%, 93% in respectively in rural area & 92%, 86%, 94% respectively in urban area.(5) The study done by Kulkarni et al reported coverage, effective coverage and compliance of MDA was 93.9%, 83.2%, 88.5% respectively overall; 95.1%, 87.9%, 92.4% in respectively in rural area & 89.9%, 68.2%, 75.8% respectively in urban area.(6) The study done by Gururaj et al reported coverage, effective coverage and compliance of MDA was 76.1%, 57.2%, 75.1% respectively.(7) The study done by Shivalingaiah et al reported coverage, effective coverage and compliance of MDA was 83.2%, 76.9%, 92.5% respectively in Kalaburagi district and 86.7%, 75.4%, 86.9% respectively in Yadgir district.(8) The study done by Panika and Sahu reported coverage, effective coverage and compliance of MDA was 86.6%, 64.3%, 74.3% respectively.(9) The study done by Haldar et al reported coverage, effective coverage and compliance of MDA was 65.5%, 50%, 75.2% respectively overall.(10) The study done by Banerjee et al reported coverage, effective coverage and compliance of MDA was 55.2%, 48.5%, 87.9% respectively overall.(11) The study done by Banerjee et al reported coverage, effective coverage and compliance of MDA was 76.4%, 64.1%, 83.9% respectively for DEC and 74.8%, 63.3%, 84.6% for Albendazole & DEC.(12) The study done by Paul et al reported coverage, effective coverage and

compliance of MDA was 84%, 73.9%, 88% respectively for DEC and 83.7%, 73.3%, 87.6% for Albendazole & DEC.(13) The study done by Mane et al reported coverage, effective coverage and compliance of MDA was 82.1%, 59.4%, 72.3% respectively.(14) The study done by Hoolageri et al reported coverage, effective coverage and compliance of MDA was 96.6%, 82.5%, 85.4% respectively overall.(15) The study done by Gowda et al reported coverage, effective coverage and compliance of MDA was 84%, 67.4%, 80.2% respectively overall.(16) The study done by Bhatia et al reported coverage, effective coverage and compliance of MDA was 91.5%, 71.1%, 77.7% respectively overall.(17) The study done by Jadhao et al reported coverage, effective coverage and compliance of DEC was 81.7%, 77.8%, 95.2% respectively overall; 90.9%, 88.3%, 97.1% respectively in rural area & 57.3%, 50.3%, 7.8% respectively in urban area.(18) The study done by Haldar et al reported coverage, effective coverage and compliance of MDA was 70.1%, 56.2%, 80.2% respectively for both drugs; 70.7%, 56.6%, 80.1% respectively for DEC & 80.3%, 64.6%, 80.4% for albendazole.(19)

The study done by Panika and Sahu reported coverage, effective coverage and compliance of MDA was higher in males than females.(9) The study done by Bhatia et al reported coverage, effective coverage and compliance of MDA was higher in females than males.(17)

The study done by Bhue et al showed that the most common reason for not offering drug was beneficiaries being absent at their home during drug distribution.(4)

The study done by Kumar et al showed that the most common reason for not swallowing drug was Fear of side effects or previous experience of side effect (family members & neighbors) & drug is hot followed by don't trust on quality, Not perceived important and out of house (drug was handed over to the family members and later forget or discarded).(3) The study done by Bhue et al showed that the most common reason for not swallowing drug was fear of side effects.(4) The study done by Kulkarni et al showed that the most common reason for not swallowing drug was lack of faith in the tablets, followed by belief that tablets are not required if not affected by the disease and being out of station during the visit, fear of side effects etc.(6) The study done by Gururaj et al reported the main reason for non-consumption was drug distributor not visited, followed by out of station and lack of awareness.(7) The study done by Shivalingaiah et al reported most common reason for non-consumption was that the subjects were out of station at the time of visit by drug distributor 24 (42.10%) in Kalaburagi district and 43 (36.13) in Yadgir district.(8) The study done by Panika and Sahu reported the main reason for non-consumption was Not suffering from concerned disease followed by Fear of side effects Forget to take tablets Not present at home during distribution of drug etc. (9) The study done by Haldar et al reported most common reason for non-consumption was fear of side

effects followed by Forgotten to consume, not at home during the MDA implementation and didn't have the disease. (10) The study done by Banerjee et al reported most common reason for non-consumption was fear of side effects followed by no faith in the drugs and forgot to consume. (11) The study done by Paul et al reported most common reason for non-consumption was fear of side effects followed by no faith in MDA, not motivated, absent at home. (13) The study done by Mane et al reported most common reason for non-consumption was fear of side effects followed by suffering from other chronic diseases and having no faith in tablets. (14) The study done by Hoolageri et al reported most common reason for non-consumption was no disease followed by drug distributor did not visit, out of station and not aware. (15) The study done by Gowda et al reported most common reason for non-consumption was fear of side effects followed by forgot to take the drugs and didn't receive the drugs. (16) The study done by Bhatia et al reported most common reason for non-consumption was not necessary as they were not suffering from filariasis followed by didn't receive the drugs. (17) The study done by Jadhao et al reported most common reason for non-consumption was didn't receive the drugs followed by forgot to take drug. (18) The study done by Haldar et al reported most common reason for non-consumption was fear of side effects followed by not told specifically why to consume. (19)

The study done by Kumar et al showed that 3 cases (0.59%) had adverse reactions, all are mild cases like giddiness, Vomiting and gastric irritation. (3) The study done by Bhue et al showed that only 59 (5.7 %) people had adverse reactions. The main complaints were nausea (2.5 %), reeling of head and drowsiness (2.3 %), headache (2.2 %) followed by fainting attack and fever in 0.2 % each. (4) The study done by Kulkarni et al showed that 163 (14.68%) beneficiaries had adverse reactions. Fever (96.53%) was the most common side effect reported. Other side reactions include Sedation (1.73%), Diarrhoea (0.58%), Headache (0.58%), and fatigue (0.58%). (6) The study done by Gururaj et al reported that 20 (2.2%) subjects had adverse reaction. Nausea and vomiting were the major side effects experienced following consumption of drugs, followed by fever and other side effects. (7) The study done by Shivalingaiah et al reported that 11/699 in Kalaburagi district and 13/795 in Yadgir district had adverse reaction. Fever, nausea, vomiting, headache, diarrhoea, pain abdomen was the common adverse reaction. (8) The study done by Haldar et al reported that 25 (7.72%) individual reported adverse event. Out of that 72.0%, 24.0%, and 8.0% complained of dizziness, drowsiness and vomiting, respectively. (10) The study done by Paul et al reported that 30 (6.4%) persons experienced any side effect. The most commonly experienced side effects were dizziness (43.3%) followed by nausea, vomiting and headache (26.7%, 23.3% and

6.7% respectively). (13) The study done by Mane et al reported that 34 (7.9%) reported to have suffered side reactions and it was found that majority had vomiting followed by fever. (14) The study done by Hoolageri et al reported that 24 persons suffered from nausea and vomiting. (15) The study done by Jadhao et al reported that 6 (1.38%) persons had adverse effects, and all were having mild symptoms like nausea, vomiting, mild fever etc. (18) The study done by Haldar et al reported that 6.44% reported adverse events of which 60.71%, 53.57%, and 35.71% complained of dizziness, vertigo, and nausea, respectively. (19)

Conclusion

The overall effective coverage of MDA was very low (19.1%) that lags far behind the national target of >85%. Approx. half of the study population were offered MDA overall & it was even worse in urban area where approx. one- fourth of them were offered MDA. The offer- swallow gap was markedly higher in rural area. The main reasons for not offering MDA as reported by study population was that nobody came to offer MDA and people were not present in house. The main reasons for not swallowing MDA as reported by study population was perception that 'if they are not sick, they didn't require drugs', no information about MDA and fear of side effects.

Recommendation

IEC activities are required to create awareness regarding the need and safety before MDA round. Development of better drug delivery strategies. Strengthening monitoring system as many reported that nobody came to offer MDA. Special pre- MDA IEC activities in rural areas to bridge offer- swallow gap.

Limitation of the study

Very less sample size was covered in urban area that seems insufficient to give clear picture of MDA coverage.

Relevance of the study

The study provides estimates of MDA coverage, compliance, reasons for non- offering, non- consumption, and consumption of MDA in a district of Bundelkhand region and act as add on evidence to previously published literature.

Authors Contribution

Acknowledgement

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Tables

TABLE 1 DRUG OFFERED & SWALLOWED BY AREA TYPE AND SEX

Particulars	Rural		Rural Total	Urban		Urban Total	Grand Total
	Female	Male		Female	Male		
Persons checked (n)	801	918	1719	54	64	118	1837
Albendazole offered	451(56.3%)	491(53.5%)	942(54.8%)	22(40.7%)	21(32.8%)	43(36.4%)	985(53.6%)
Albendazole swallowed	228(28.5%)	219(23.9%)	447(26.0%)	21(38.9%)	18(28.1%)	39(33.1%)	486(26.5%)
Albendazole swallowed	228(50.6%)	219(44.6%)	447(47.4%)	21(95.4%)	18(85.7%)	39(90.7%)	486(49.3%)
DEC offered	441(55.1%)	478(52.1%)	919(53.5%)	17(31.5%)	15(23.4%)	32(27.1%)	951(51.8%)
DEC swallowed	167(20.8%)	161(17.5%)	328(19.1%)	14(25.9%)	10(15.6%)	24(20.3%)	352(19.2%)
DEC swallowed	167(37.9%)	161(33.7%)	328(35.7%)	14(82.4%)	10(66.7%)	24(75.0%)	352(37.0%)
All drugs offered	441(55.1%)	476(51.9%)	917(53.3%)	17(31.5%)	15(23.4%)	32(27.1%)	949(51.7%)
All drugs swallowed	166(20.7%)	160(17.4%)	326(19.0%)	14(25.9%)	10(15.6%)	24(20.3%)	350(19.1%)
All drugs swallowed	166(37.6%)	160(33.6%)	326(35.6%)	14(82.4%)	10(66.7%)	24(75.0%)	350(36.9%)
Adverse drug reaction	1(0.4%)	0(0.0%)	1(0.2%)	0(0.0%)	0(0.0%)	0(0.0%)	1(0.2%)

TABLE 2 REASONS FOR DRUGS NOT OFFERED

.	Rural (n=800)	Urban (n=86)	Grand Total (n=886)	Rural (n=776)	Urban (n=73)	Grand Total (n=849)
	DEC			Albendazole		
Underage (<2 years)	3.5%	0.0%	3.2%	3.4%	0.0%	3.1%
Pregnant	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
Breastfeeding	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sick	0.4%	0.0%	0.3%	0.4%	0.0%	0.4%

.	Rural (n=800)	Urban (n=86)	Grand Total (n=886)	Rural (n=776)	Urban (n=73)	Grand Total (n=849)
Absent (not present at home during survey)	10.4%	16.3%	10.9%	10.8%	19.2%	11.5%
Didn't hear about MDA	0.0%	4.7%	0.5%	0.0%	5.5%	0.5%
Drug ran out/ drug shortage	0.4%	7.0%	1.0%	0.4%	8.2%	1.1%
Nobody came (nobody came to offer drugs)	82.1%	57.0%	79.7%	84.7%	67.1%	83.2%
Other	3.1%	15.1%	4.3%	0.3%	0.0%	0.2%

TABLE 3 REASONS FOR DRUGS NOT SWALLOWED

Reasons	Rural (n=591)	Urban (n=8)	Grand Total (n=599)	Rural (n=496)	Urban (n=6)	Grand Total (n=502)
	DEC			Albendazole		
	591	8	599	496	6	502
Fear of side effects	14.0%	0.0%	13.9%	15.7%	16.7%	15.7%
Bad Taste	2.0%	37.5%	2.5%	1.6%	0.0%	1.6%
Not sick	61.3%	62.5%	61.3%	58.9%	83.3%	59.2%
Not enough information given	16.1%	0.0%	15.9%	15.9%	0.0%	15.7%
Other	6.6%	0.0%	6.5%	7.9%	0.0%	7.8%

TABLE 4 REASONS FOR DRUGS SWALLOWED

Reasons	Rural (n=328)	Urban (n=24)	Grand Total (n=352)	Rural (n=447)	Urban (n=39)	Grand Total (n=486)
	DEC			Albendazole		
Fear of disease	16.5%	41.7%	18.2%	35.6%	25.6%	34.8%
To treat disease	29.9%	45.8%	31.0%	21.9%	59.0%	24.9%
Because it was given free	1.8%	0.0%	1.7%	3.1%	0.0%	2.9%
Useful information from drug administrator (DA)	51.8%	12.5%	49.1%	39.4%	15.4%	37.4%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%