Research Article

Mass drug administration coverage evaluation for elimination of lymphatic filariasis in Chhatarpur district of Madhya Pradesh

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Received March 8, 2015. Accepted March 15, 2015

Abstract

Background: Mass drug administration (MDA) means administration of diethylcarbamazine (DEC) tablet to all people (excluding children <2 years, pregnant women, seriously ill persons) in endemic areas once in a year is one of the strategies to eliminate lymphatic filariasis.

Objective: To assess the coverage and compliance of MDA and factors for noncompliance.

Materials and Methods: A community-based cross-sectional house-to-house visit was carried out in endemic district Chhatarpur. Three rural and one urban clusters of Chhatarpur district, Madhya Pradesh, we selected as per National Vector Borne Diseases Control Programme guidelines. A predesigned questionnaire was used to collect information regarding consumption of DEC and other relevant information. Actual coverage, compliance, effective coverage, coverage–compliance gap (CCG), reasons for noncompliance, side effects, if any, were studied. SPSS, version 11.5, for Windows was used for statistical analysis.

Results: A total of 120 households surveyed yielded 643 eligible population. Coverage rate was 78.84%, and compliance rate, CCG, effective coverage rate was 76.52%, 23.48%, and 60.34%, respectively. It was found that 255 persons did not consume the drug. Out of 255, 53.3% did not receive drug. Fear of side effects and loose tablet distribution (low quality of drug) were the most common reasons found for nonconsumption in rural and urban areas, respectively. Persuasion for consumption of drug by a drug distributor (DD) was found in only 35% households. Only 11.67% household had prior information regarding MDA. Information, education, and communication (audiovisual aids) activity reached to only 31.67% households. Side effects were experienced by 4.4%.

Conclusion: Both coverage and drug compliance need to be improved. Issues like fear of side effects should be addressed through effective behavior change communication strategies.

KEY WORDS: Coverage, compliance, mass drug administration, lymphatic filariasis

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2015.08032015190	

Introduction

Lymphatic filariasis (LF) or elephantiasis is one of the six diseases that can potentially be eradicated. The infection is endemic in more than 80 countries, with more than 1.3 billion people at risk and 120 million already infected globally.[1] It is the fourth most common cause of disability worldwide.[2] Two-thirds of the endemic population resides

in South-East Asia and one-third lives in India.[3] Considering the human suffering, social stigma, and costs associated with LF morbidity, and in response to the specific resolution by the World Health Assembly, the Global Program to Eliminate Lymphatic Filariasis was launched by the World Health Organization (WHO) in 2000 with the goal of eliminating LF as a public health problem by the year 2020.[4] In 2002, India set an ambitious national health goal to eliminate LF by 2015.[5] To achieve this goal, a "two-pillar" strategy of interrupting transmission through mass drug administration (MDA) with diethylcarbamazine (DEC) and providing care for those with the disease was adopted.[6] India's filarial control program has scaled up MDA over the past several years and recently added albendazole (ABZ) to the treatment of the 590 million Indians living at risk of infection.[7] In MDA, the drug is to be consumed in the presence of a drug distributor (DD). DEC is given to almost everyone in the community, irrespective of their symptoms. This is indicated in high and hyperendemic areas. A single dose is recommended by international task force (WHO) for all except for children below 2 years, pregnant women, and very sick patients.[8] The principle behind MDA is that a single dose of DEC administered annually for 4–6 consecutive years will interrupt the transmission of filariasis.[9] However, the number of MDA rounds necessary to achieve elimination depends, to a large extent, on coverage, drug efficacy, and the endemicity level. It is estimated that to interrupt transmission, MDA compliance must exceed 65%–75%, with 5–6 rounds of treatment.[10] In India, the coverage levels vary from 55% to 90%. In India, some states *viz*. Andhra Pradesh, Bihar, Jharkhand, and Madhya Pradesh are among the worst affected states in the country.[11] On the basis of microfilaria surveys and the line listing of lymphoedema cases, Madhya Pradesh had identified 11 districts, and accordingly, they has been included for observing MDA since 2004.[12] The present survey was carried out to evaluate the coverage, compliance, and reasons for noncompliance (community perspective) of MDA in Chhatarpur district of Madhya Pradesh.

Materials and Methods

Mass drug administration of DEC was carried out in Chhatarpur district on April 2010. A community-based cross-sectional study was conducted for the evaluation of MDA by a household survey in four selected clusters (three rural and one urban) of Chhatarpur district of Madhya Pradesh as per National Vector Borne Diseases Control Programme (NVBDCP) guidelines. The field survey was conducted after 2 months of MDA campaign (i.e., in July 2010). The study team constituted faculty members and postgraduate students of the Department of Community Medicine. The objective was to study the coverage and compliance, reasons for noncompliance, and drug-related side effects in the community. Feedback about the role of a DD in imparting health education, persuasion for consumption of drug, and knowledge about any information, education, and communication (IEC) activity undertaken before the start of the MDA round was obtained from the community. For selection of rural sites, one village was selected from a primary health center (PHC) with low coverage of DEC (i.e., below 50%), one village was selected from a PHC with medium coverage of DEC (i.e., between 50% and 80%), and one village was selected from a PHC with high coverage of DEC (i.e., above 80%). For urban area, one ward of the district was selected randomly. The selected three villages and one urban ward were designated as clusters. Selected villages and their representative PHCs were Rajapur (Bamitha), Dipoli (Ramtoria), and Angour (Angour). In urban area, ward no. 38 was selected. House-to-house survey was carried out. The house for the beginning point was selected randomly and the team moved in a particular direction. All the subjects in the house except the children less than 2 years and pregnant women were included. In each of the selected clusters 30 households were surveyed. Thus, 120 households were surveyed for evaluation of MDA. A predesigned questionnaire (provided by Director Health Services, State Health Committee, NVBDCP) was used to collect information regarding consumption of DEC and other relevant points. The data obtained were entered and analyzed using Statistical Package for the Social Sciences (SPSS), version 11.5, for Windows. All the sampled eligible population in the study area was included in the study. Exclusion criteria were pregnant and lactating mother, children below 2 years, seriously ill persons, severely debilitated patient, and elderly people.

The working definitions adopted for drug coverage and drug compliance as per NVBDCP guidelines are as follows:

Drug coverage: It is the number of eligible persons who received DEC during MDA campaign. It is calculated as the total number of persons who received drug divided by eligible population and is expressed as percentage.

Drug compliance: It is the number of persons who ingested DEC in presence of a DD during MDA campaign. It is calculated as the total number of persons who ingested drug divided by total number of persons who received the drug and is expressed as percentage.

Coverage–Compliance Gap (CCG): It refers to the people who got the drug but did not consume due to various reasons.

Effective coverage rate: It is the end product of coverage by the health system and compliance by community. The percentage for effective coverage was calculated after taking total number of people who were eligible for receiving DEC tablets as denominator (Effective coverage = No. of people who had ingested sufficient dose of DEC tablets/Total people eligible for receiving the DEC tablets × 100).

Ethics

The study was cross sectional and did not involve patient intervention methods; hence, ethical issue does not arise.

Limitation

This study was conducted after 2 months of MDA campaign, which is a limitation (recall bias).

Table 1: Distribution of population of surveyed districts

District Chhatarpur	Total population	Eligible population		Population covered (out of eligible)	
		N	%	*N*	%
Chhatarpur urban	139	132	94.96	115	87.12
Rajapur (Bamitha)	172	158	91.86	141	89.24
Dipoli (Bada Malhara)	217	204	94.0	153	75.0
Angour (Satai)	157	149	94.9	98	65.77
Total	685	643	93.86	507	78.84

Results

District Chhatarpur was selected as the study area. This district is one of the 11 endemic districts of MP. MDA round was conducted in April 2010. As per the 1991 census, the total population of the district was 1,158,076 out of which 934,552 was rural population and 223,524 is urban. Out of total population, 43,482 were scheduled tribes. Four clusters, including one from urban and three from rural areas, were studied. A total 120 households (90 rural and 30 urban) were surveyed, yielding a population of 685. Of 685 individuals, 643 were found to be eligible for drug administration (93.86%). Of 643 eligible persons, 507 received DEC by a DD. Overall coverage rate of study population was found to be 78.84% [Table 1]. It was highest in Rajapur (Bamitha; 89.24%) and lowest in Angour (65.77%). Compliance rate, CCG, and effective coverage rate are shown in Table 2. Effective coverage rate was marginally higher in urban area than rural areas, but no significant difference was found [Table 3]. The remaining (n = 255), although eligible, did not consumed the drug for various reasons [Table 4]. Of these 255 individuals, almost half of the eligible population (53.3%) did not received drug because the DD failed to deliver drug to them. This proportion was much higher in rural areas [Table 4]. Common reasons found in rural areas DD visited households when almost all family members went to the farms. The most common reason found in urban areas was they went to some other place on vacation. Of 255, 119 (46.7%) persons received the drug but did not consume due to various myths. The most common reason found was the drug was perceived hot (fear of side effects) in rural population. Loose tablet distribution (low quality of drug) was the most common reason cited by urban population for nonconsumption [Table 4]. Persuasion for consumption of drug by the DD was reported by only 35% households. Rest said that the

Table 2: Compliance rate, coverage–compliance gap, and effective coverage rate

District Chhatarpur	Eligible population	DEC given by DD	Consumed (compliance rate)		Coverage–compliance gap	Effective coverage rate
			N	%	%	%
Chhatarpur urban	132	115	87	75.65	24.35	65.90
Rajapur (Bamitha)	158	141	108	76.59	23.41	68.35
Dipoli (Bada Malhara)	204	153	112	73.20	26.80	54.90
Angour (Satai)	149	98	81	82.65	17.35	54.36
Total	643	507	388	76.52	23.48	60.34

Table 3: Drug coverage and compliance rates in urban and rural settings

Area	Coverage rate (%)	Compliance rate (%)	CCG (%)	Effective coverage rate (%)
Urban (N = 132)	87.12	75.65	24.35	65.90
Rural (N = 511)	76.71	76.78	23.22	58.90
Total (N = 643)	78.84	76.52	23.48	60.34
P-value	0.0084, very significant	0.8032, not significant	–	0.1717, not significant

Table 4: Reasons for not swallowing drug

Reason	Rural (n = 210), no (%)	Urban (n = 45), no (%)	Total (n = 255), no (%)
Drug not delivered	119 (56.66)	17 (37.77)	136 (53.33)
Drug is hot	42 (20.0)	07 (15.5)	49 (19.2)
Previous experience of side effect (family members and neighbors)	11 (5.2)	06 (13.3)	17 (6.67)
Out of house (drug left to the family members)	09 (4.28)	–	09 (3.52)
Do not take allopathic medicine	11 (5.2)	–	11 (4.31)
Not perceived important	18 (8.57)	–	18 (7.05)
Loose tab given by DD	–	15 (33.33)	15 (5.88)

Table 5: Drug distributor's interest and media approach to reach the house-holders

	No of key persons in household interviewed (n = 120)	%
DD persuaded swallowing of drug in his presence	42	35
DD explain importance and other details regarding prevention and transmission	42	35
Prior information of MDA dose, C/I , side effect	14	11.67
Any audio or visual media announcement on MDA	38	31.67

DD handed over drugs to one family member for consumption later on. Similarly, information regarding prevention and transmission of filaria and why DEC is being given was furnished to only 35% households. Very few household had prior information regarding MDA (11.67%). In rural areas, almost all of them got this information by health staff and Integrated Child Development Services workers. Similarly IEC (audiovisual aids) activity reached to only 31.67% households [Table 5]. Side effects were experienced by 17 persons out of 388 (4.4%), which was acceptable. These were minimal, well documented, and transient.

Discussion

The present study revealed coverage rate of 78.84%, which is far behind that reported by another study conducted in Madhya Pradesh.[13] However, the success of elimination mainly depends on the actual consumption or compliance with MDA rather than the MDA coverage. This study revealed that actual MDA compliance was 76.52%. Several other studies across India revealed varied MDA compliance ranging from 42% to 89%.[14–17]

The drug distribution was during daytime when the members of the households had been to work. Most of the people were not available at home during the morning hours, so the DDs handed over the tablets to any member of the family for the whole family, thereby reducing the compliance. Thus, there is a definite need to ensure that the DD meets the person, for which he may visit the home in the evening. Similar findings were reported in another study.[11] Revisits of the houses were not undertaken in most of the places due to lack of human resources. Recruitment of more field staff is needed for door-to-door visits to have effective coverage and on-the-spot drug administration. There is an urgent need for more effective drug delivery strategies. The roles of the DDs and other health workers cannot be ignored to achieve success in MDA coverage and compliance.

Besides, the fact that DDs handed over the tablets to any one member of the family for the whole family and did not ensure that the person concerned consumes the tablets in front of them further reduced the compliance.

The concept of MDA is to approach every eligible individual in the target community and administer annual single dose of DEC. This annual dose is to be repeated every year for a period of 5 years or more with a minimum of 85% drug compliance. A highly effective coverage of (>85%) is essential to achieve the interruption of transmission and elimination of disease in India.[6] Effective coverage is one of the most valuable indicators because it reflects both coverage and compliance. It actually denotes the compliance by the community with respect to the eligible population. The effective coverage (60.34%) was far behind the recommended level (≥85%) in the present study.

Coverage compliance gap is a better indicator for assessing the effectiveness of MDA program among program managers. It actually reflects the proportion of covered people not consuming the drugs and explores the possible determinants for nonconsumption. The present study revealed a CCG of 23.48%. Lesser proportion of CCG (11%) was reported in a study conducted in Gujarat.[14] Another study conducted in Madhya Pradesh reported CCG of 10.1%.[13] The difference might be due to different study setting. The CCG may be bridged up by giving enormous stress on Behavior Change Communication (BCC) strategies that aim to motivate the people for drug consumption and stress on supervised dosage.

Regarding the channels of behavioral change communication, both interpersonal and mass media communication strategy were found inadequate for awareness generation among the community, which necessitates the strengthening of BCC activities. Audiovisual aids have poor penetration, particularly in rural areas. Persons got prior information regarding MDA and DEC through health staff and previous round. This must be kept in mind when planning for IEC activities.

This study revealed DD imparted knowledge and awareness about LF and MDA to few community members. Hence, they have restricted knowledge about the disease and its control measures. Similar findings have been reported in other studies conducted in India.[7,18,19]

In our study, the fear of side effects was the major issue for poor compliance. Similar findings have been reported by Nirgude et al.[20] in their study. Godale and Ukarande[21] also reported fear of side effects of drugs (45.38%) as the most common reason for noncompliance followed by lack of awareness about LF. The present study reported very few side effects and they were also minor, transient (lasting few hours), and drug specific. Similar lower incidences of side effects were reported from endemic areas of Gujarat and rural West Bengal of India.[14, 22] However, they also need to be addressed as they constitute the cause of noncompliance and may adversely affect the next round. Therefore, it is imperative that people are made aware about these side effects to take proper management and not to have any misconception or

fear. Training program for medical officers and health workers involved in MDA should emphasize more on how to address the fear of side effects among beneficiaries and measures to ensure "On-the-Spot Swallowing" of tablets. A common understanding is that drug is hot ("*dava garam hai, garmi karegi*") prevails about allopathic medicine, particularly in rural community. Interpersonal communication may be more effective particularly when imparted by some elderly person among them. Importantly, fear is not directed specifically to DEC, which was general to any allopathic medicine. All these aspects can be taken care of by supervised "on-the-spot" DEC consumption and raising awareness of general population regarding LF (demand creation). People residing in urban areas raised the issue of distributing loose tablets. This implies that people do not have faith in the government-supplied drugs. To conclude, this study revealed that both coverage and drug compliance needs to be improved. Issues like on-the-spot swallowing, knowledge of the community regarding LF, and its common preventive and control measures including MDA and fear of side effects were not comprehensively addressed through intensive BCC strategies.

Recommendations

1. Coverage may be increased by developing a micro-plan by taking consideration the geographical location (population density/sparsity) and accordingly the number of DD and farming practices. Date and time selected for the MDA should suit for majority of the population.
2. Efforts are needed to reduce CCG gap before increasing the coverage. It needs motivating and sensitizing the community about LF through intensive health education. Community needs to be sensitized about benefits of consuming drug. Patients with filariasis residing in the community may be involved in such campaign.
3. Incidence of side effects after MDA was minimal. All side effects were mild and needed no medical intervention but need assurance. For this, medical team may be constituted at HQ and a toll-free number may be organized and widely publicized before round.
4. DD hardly insisted on supervised "on-the–spot" administration of drugs. This issue can be addressed by strict supervision and immediate feedback. This alone can bring down the CCG considerably.
5. Due emphasis must be given in training of DD on persuasion and assurance of side effect.
6. Many persons raised the issue of distributing loose tablets. This can be explained scientifically by the DD that it will reduce the cost of the medicine without affecting the quality.
7. Various modes of pre-MDA IEC can be used. For interpersonal communication, announcement in local language will be suitable for rural areas as most of them are illiterates. The announcement should be done just few days before the campaign. IEC should focus on the rationale for MDA, its benefits, side effects, risk–benefit approach, date of the MDA round, and whom to contact if they did not get drug. A toll-free number may be arranged and widely publicized regarding any information about LF, prevention, MDA, its side effect, management of side effect, and so on.

Conclusion

Both coverage and drug compliance need to be improved. Issues like fear of side effects should be addressed through effective BCC strategies.

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How to cite this article: Marathe N, Chalisgaonkar C. Mass drug administration coverage evaluation for elimination of lymphatic filariasis in Chhatarpur district of Madhya Pradesh. Int J Med Sci Public Health 2015;4:927-932

Source of Support: Study was funded by Govt. of Madhya Pradesh, India, **Conflict of Interest:** None declared.