



## Awareness of health personnel about lymphatic filariasis and mass drug administration in Karnataka state of South India

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### RESEARCH

Please cite this paper as: Joseph N, Subba SH, Jain A, Unnikrishnan B, Nagaraj K, Kotian SM. Awareness of health personnel about lymphatic filariasis and mass drug administration in Karnataka state of South India. AMJ 2011, 4, 2, 87-93 Doi: <http://dx.doi.org/10.4066/AMJ.2011.533>

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### Abstract

#### Background

A third of world's filariasis cases occur in India. As a result Mass Drug Administration (MDA) was commenced in 1997 with the aim of eliminating this disease by 2015. However the coverage of MDA was not satisfactory. The underlying reasons for the poor coverage need to be identified. This study was conducted to assess the awareness of health personnel of lymphatic filariasis and the MDA programme.

#### Method

This cross-sectional study was conducted in Kundapura taluk of Karnataka state in India during the 6<sup>th</sup> round of the MDA which was held between December 11 to 13, 2009. 78 health personnel who were posted for drug distribution were selected by convenience sampling. After obtaining informed consent health personnel were interviewed individually using a semi-structured questionnaire. Performance of health personnel was assessed according to points scored for their responses.

#### Results

The mean age of all participants were 22.7± 8.9 years, 74(94.1%) were females and 58(74.4%) were nursing students. Only 17 (21.8%) participants had prior experience before taking part in this round of MDA. Only 4 (5.1%) participants achieved good scores while 45 (57.7%) got

average scores. Performance scores were significantly better among paramedical workers (P<0.025) and participants with at least 4 years of experience in MDA (P<0.004).

10 (12.8%) participants held the misconception that MDA should not be given to patients with DM (diabetes mellitus) and 7 (9.0%) felt that it should not be given to patients with hypertension or elderly people. This was seen significantly more (P<0.001) among non medical workers compared to others.

#### Conclusion

Very few participants in this study attained good performance scores regarding their knowledge of lymphatic filariasis and the MDA programme. Performance scores were better among paramedical workers compared to others. However misconceptions about contraindications to MDA were seen in all participants and this must be addressed by future training.

#### Key Words

Mass drug administration, Lymphatic filariasis, Health Personnel, Awareness

#### Background

The World Health Organization (WHO) estimates that Lymphatic Filariasis (LF), which is the second most common vector borne parasitic disease after malaria, affects around 120 million people worldwide with 1 billion at risk.<sup>[1]</sup> One third of the world's infected people live in India, of which approximately 21 million people have symptomatic filariasis.<sup>[1,2]</sup>

The disease may result in no clinical symptoms through to both acute and chronic manifestations such as lymphangitis, lymphadenitis, elephantiasis of genitals, legs and arms. Due to its ability to cause long term disability and suffering with consequent economic and social implication, this disease has acquired enough attention for the WHO Assembly to call for its elimination by use of mass drug administration (MDA). In India, the MDA programme was started in 1997 with the aim of eliminating the disease by 2015. MDA coverage of 80% for five years is deemed necessary for elimination; however the coverage to date has been only 40-60%.<sup>[3]</sup>



Even with adequate coverage, poor compliance may reduce the efficacy of the programme. [4] A recent study in south India reported that only 30.5% study participants actually consumed the drugs distributed under the MDA programme. Fear, illness and misconceptions were the commonest reasons for non-compliance stated by non-consumers. [4] From this it is obvious that several reasons for non-consumption are rectifiable provided that the drug distributors play an active role in educating people about the importance of the MDA programme.

The MDA programme is demanding in terms of manpower, funds and logistics and the very purpose of it have not been fulfilled so far. Hence reasons for low coverage and consumption rate must be identified so that they can be corrected and the original targets achieved.

Several studies have reported on community perception of filariasis and MDA. However, studies that investigate the awareness of the personnel who deliver tablets to the general population are very limited. However, as discussed above, it is these individuals that can markedly affect the quality of the programme. Information from such studies can be used to improve the training of these drug distributors. Another study done in South India reported unsatisfactory awareness about MDA among paramedical workers. The questionnaire used in the same study was not very comprehensive. [5] Taking into consideration these aspects, this study was conducted to assess the awareness of health personnel about lymphatic filariasis and the MDA programme.

### Method

This cross-sectional study was conducted in the Udupi district of Karnataka state in India during the 6<sup>th</sup> round of MDA held between December 11 to 13, 2009. Institutional ethical committee approval was obtained before conducting this study. One of the three talukas (subdistricts) of Udupi district namely Kundapura was randomly selected for the study. Using the definition of an "average" awareness level about the MDA programme as 70% from a previous study, [5] the sample size calculated for 95% confidence limits at 85% power was 77 participants. Out of the 180 workers posted for MDA activity in this taluka for the current round, 78 of them were chosen for enrolment onto the study by convenience sampling. As the MDA round was in progress during this study, the investigators approached any drug distributor in the field as and when they came across them. Each participant, after giving verbal informed consent, was interviewed individually using a semi-structured questionnaire. Questions asked included those about the causative agent, mode of transmission, clinical features and laboratory diagnosis of filariasis. Questions relating to the MDA programme included those about dosages of various tablets, drug side effects, contraindications, purpose of the MDA, attitudes regarding the usefulness of MDA to eliminate filariasis and the responses of people after receiving the tablets. There were a total of 25 questions. Answers were scored between 1 and 7 by the investigators depending on the importance of the question for the success of the programme. All the points achieved in each questionnaire were totalled out of a maximum of 100 and

the awareness level with respect to filariasis and the MDA programme was categorized into poor (<61), satisfactory or average (61 to 84) and good (>84). Categories were defined on the basis of the total possible scores for must know and nice-to-know questions.

The cut-off value for points below which performance is poor was based on the cumulative points allocated to must know questions in the questionnaire. The must know questions were names of the two drugs delivered under MDA, their strength, dosages in various age groups, side effects, contraindications and purpose of giving these drugs. Similarly the cut-off value for satisfactory performance was based on the cumulative points for nice to know questions made less from the maximum score of 100 in the questionnaire. Details of scoring pattern are detailed along with the questionnaire in the appendix.

All the data collected were stored and analyzed using version 11.5 of the Statistical Package for Social Sciences software package (SPSS Inc., Chicago,IL). Chi-square was used for testing statistical significance and P value <0.05 was considered as significant.

### Results

Health personnel play a vital role in distribution of drugs to households. Their efficiency thus determines the success of MDA programme.

Of the total 78 study participants, 74 (94.1%) were females and 4(5.9%) were males. Mean age of participants were 22.7± 8.9 years.

**Table 1. Association between performance of participants and their occupation and numbers of years in MDA.**

Occupation	Poor n(%)	Average n(%)	Good n(%)	Total n(%)
Students	25 (43.1)	32 (55.2)	1 (1.7)	58(100)
Para medical workers <sup>†</sup>	2 (13.3)	10 (66.7)	3 (20)	15(100)
Non medical workers <sup>¶</sup>	2 (40)	3 (60)	0	5(100)
Years of experience in MDA				
Nil	27(44.3)	33(54.1)	1(1.6)	61(100)
1 to 3 years	2(20)	7(70)	1(10.0)	10(100)
4 to 6 years	0	5(71.4)	2(28.6)	7(100)
Total	29(37.2)	45(57.7)	4(5.1)	78(100)
			$\chi^2 = 11.2, DF=4, P=0.025$	
			$\chi^2=11.046, DF=2, P=0.004$	



†Health Workers, Anganwadi workers, Laboratory technician, Staff nurse

¶Non medical workers: Teachers, NSS volunteers

Occupational distribution showed 58 (74.4%) participants to be nursing students, 8 (10.3%) were health workers, 4 (5.1%) were anganwadi workers (employed under Integrated Child Development Services, Government of India), 3 (3.8%) were NSS (National Service Scheme) activists, 2 (2.6%) were teachers, 2 (2.6%) were laboratory technicians and 1 (1.3%) was a staff nurse.

As regards the participants' experience of the MDA, 10 (12.8%) had 1 to 3 years experience and only 7 (9.0%) had 4 to 6 years experience before taking part in this round of the programme.

The mean score of all participants was 60.5±18.7 points. The performance score showed that 4 (5.1%) participants were found to have a "good" awareness level, 45 (57.7%) an "average" awareness level and 29 (37.2%) a "poor" awareness level.

Among the participants attaining good scores, most were para-medical workers (n = 3; 20%) and personnel with experience of 4 to 6 years (n = 2; 28.6%). These associations were statistically significant. (Table 1)

Three (3.8%) participants, all of whom were students, indicated that they lacked faith in MDA by stating that it cannot effectively eliminate filariasis.

**Table 2. Association between occupation of participants and years of experience in MDA with their opinion as to whether MDA can be given to diabetic patients.**

<i>Occupation</i>	<i>MDA for DM patients</i>	<i>MDA not for DM patients</i>	<i>Total</i>
Students	54(93.1%)	4(6.9%)	58(100.0%)
Para medical workers	13(86.7%)	2(13.3%)	15(100.0%)
Non medical workers	1(20.0%)	4(80.0%)	5(100.0%)
		$\chi^2=22.014, DF=2, P<0.001$	
Years of experience in MDA			
No experience	54(88.5%)	7(11.5%)	61(100.0%)
1 to 3 years of experience in MDA	8(80.0%)	2(20.0%)	10(100.0%)
4 to 6 years of experience in MDA	6(85.7%)	1(14.3%)	7(100.0%)
Total	68(87.2%)	10(12.8%)	78(100.0%)
		$\chi^2= 0.573, DF=2, P=0.751$	

Each participant was asked about the responses they received from people when they delivered the drugs to their home. They reported a general acceptance of the programme with few queries. Among 16 cases in which opposition to the programme was reported, eight of them

reported that the people were fearful of fear of drug side effects. Other reasons stated by people for non-acceptance of the programme were an unwillingness to take tablets every year, the belief that the disease will not affect people belonging to the upper classes and presence of underlying diseases like hypertension and diabetes mellitus.

Some of the participants in this study were found to hold misconceptions regarding groups in whom MDA is contraindicated. For instance 10 (12.8%) participants held the misconception that MDA should not be given to patients with DM and 7 (9.0%) believed that it should not be given to patients with hypertension. Also 7 (9.0%) and 2 (2.6%) participants held the misconception that MDA should not be given to elderly (above 60 years) and "weak people" respectively.

The misconception that MDA tablets cannot be given to patients with diabetes was seen significantly more frequently among non-medical workers 4(80%) compared to others ( $\chi^2=22.014, P<0.001$ ). (Table 2)

The misconception that MDA tablets cannot be given to hypertensive patients was again seen significantly more frequently among non-medical workers 3(60%) compared to others ( $\chi^2=18.453, P<0.001$ ). (Table 3)

**Table 3. Association between occupation of participants and experience in MDA with their opinion as to whether MDA can be given to hypertensive patients.**

<i>Designation</i>	<i>MDA for HTN patients</i>	<i>MDA not for HTN patients</i>	<i>Total</i>
Students	56(96.6%)	2(3.4%)	58(100.0%)
Para medical workers	13(86.7%)	2(13.3%)	15(100.0%)
Non medical workers	2(40.0%)	3(60.0%)	5(100.0%)
		$\chi^2=18.453, DF=2, P<0.001$	
Years of experience in MDA			
No experience	57(93.4%)	4(6.6%)	61(100.0%)
1 to 3 years of experience in MDA	8(80.0%)	2(20.0%)	10(100.0%)
4 to 6 years of experience in MDA	6(85.7%)	1(14.3%)	7(100.0%)
Total	71(91.0%)	7(9.0%)	78(100.0%)
		$\chi^2= 2.166, DF=2, P=0.339$	

With regards to misconceptions that MDA drugs should not be administered to patients with diabetes and hypertension, these misconceptions were held more commonly among participants with 1 to 3 years of experience compared to those with 4 to 6 years of experience in this programme. (Table 2 & 3)

Four out of 15 (26.7%) paramedical workers felt that MDA was contraindicated in the elderly in comparison to 2 (3.4%) student participants and 1 (20%) non-medical worker.



( $\chi^2=8.66$ ,  $P=0.013$ ). (Table 4) This misconception was found to increase with years of experience in MDA ( $\chi^2= 6.008$ ,  $P=0.05$ ). (Table 4)

Seventeen (21.8%) participants reported that MDA was interfering with their routine work. Thirteen out of 58 nursing students (22.4%), reported this, 3 out of 15 (20%) paramedical workers and 1 out of 5 (20%) non-medical workers.

Thirteen (21.3%) participants with no previous experience of the MDA, 2 (20.0%) with 1 to 3 years and 2 (28.6%) with 4 to 6 years of experience in this programme felt that these postings did affect their routine work ( $\chi^2=0.216$ ,  $P=0.898$ ).

**Table 4. Association between occupation of participants and years of experience in MDA with opinion as to whether MDA can be given to elderly people.**

<i>Designation</i>	<i>MDA for elderly people</i>	<i>MDA not for elderly people</i>	<i>Total</i>
Students	56(96.6%)	2(3.4%)	58(100.0%)
Para medical workers	11(73.3%)	4(26.7%)	15(100.0%)
Non medical workers	4(80.0%)	1(20.0%)	5(100.0%)
		$\chi^2=8.66$ , $DF=2$ , $P=0.013$	
Years of experience in MDA			
No experience	58(95.1%)	3(4.9%)	61(100.0%)
1 to 3 years of experience	8(80.0%)	2(20.0%)	10(100.0%)
4 to 6 years of experience in MDA	5(71.4%)	2(28.6%)	7(100.0%)
Total	71(91.0%)	7(9.0%)	78(100.0%)
		$\chi^2= 6.008$ , $DF=2$ , $P=0.05$	

Common suggestions given by participants for improving the MDA programme for future rounds were to improve the training for the personnel delivering the programme ( $n = 8$ ; 10.3%) and to provide a more detailed explanation about the disease to patients ( $n = 8$ ; 10.3%). (Table 5)

**Table 5. Suggestions given by participants for improving MDA programme (n=78).**

<i>Suggestions</i>	<i>No. (%)</i>
Training should be more extensive	8(10.3)
Explanation of disease should be more in detail	8(10.3)
Increase awareness level of people	7(9.0)
Canvassing can be improved by targeting schools & public places	2(2.6)
Increase the honorarium of volunteers	1(1.3)
Increase manpower in MDA programme	1(1.3)

## Discussion

Elimination of lymphatic filariasis by 2015 requires treatment coverage of the MDA programme of at least 80% in high risk areas. However, the drug consumption rate has been found to be unsatisfactory, even in the most literate of districts, during previous rounds of MDA held in Karnataka state.<sup>[6]</sup> Possible explanations could include that the target population are either ill informed or are not fully convinced about the usefulness of this programme.<sup>[5]</sup> In these circumstances the level of knowledge and communication skills of personnel who deliver the drugs may be an important factor that determines compliance with the programme and thus the success of MDA.<sup>[7]</sup>

Udupi district with the highest literacy rate (92%) in Karnataka state has not demonstrated good rates of compliance for MDA over the years.<sup>[6, 8]</sup> Coverage could be worse still in less literate districts of India.

This study showed that only four (5.1%) of the participants posted for drug distribution had a good knowledge about MDA. Interestingly this was better than the findings of a study done in few districts of Kerala during the November 2005 MDA round in which no paramedical personnel had a good knowledge.<sup>[5]</sup> From this it is obvious that the drug deliverers were not adequately aware about LF and the MDA programme and this could affect compliance rate among people as these personnel are not in a position to clear all their doubts.

For any programme to be successful in the community, the target population need to be fully educated about all aspects of it to alleviate apprehensions. For this it is essential that the personnel who are supposed to educate the community should have the required knowledge about the programme. Lack of knowledge among health personnel may lead to failure to clear the doubts of the community and it may potentially instill suspicion about the programme thus, potentially, fuelling rumours spread by individuals who are opposed to the programme.<sup>[5]</sup>

Most participants had no prior experience in MDA before being posted in this round. Performance scores were significantly poorer among the inexperienced participants and non-medical workers in our study. Thus trainers need to focus more on these groups during training sessions.

Only a few participants in our study felt that MDA will not help in LF elimination. This was in contrast to the findings of a study done in Orissa in which 76% of medical personnel felt that the elimination is not feasible through MDA.<sup>[9]</sup> It is unfortunate that even after many years of programme implementation, a few volunteers who are working for the programme do not have faith in it. Such indifferent attitudes among them might arise from lack of knowledge or erroneous beliefs. When they themselves are not convinced of the benefit of the programme they may not be able to effectively communicate the benefits of the programme to the community. Therefore they need to be better educated about the benefits and success of this programme during training sessions before the MDA rounds commence.

Common reasons of non compliance as told by participants were similar to findings from other studies which also quoted a fear of the side-effects of the drugs used, "no



disease so not necessary” and ignorance as major factors. [4, 6, 10]

In a study by Kumar et al it was observed that only 16.7% medicine distributors explained about safety or the possible side-effects of medicine. [6] Therefore, the role of the personnel involved in the MDA is mostly restricted to tablet distribution only and their roles as educators in major issues such as drug compliance, health education, side effect and morbidity management were not being given due attention. For the successful implementation of the MDA programme proper planning, intense and timely efforts to motivate the community and innovative drug delivery strategies are required.

Misconceptions such as MDA being contraindicated in hypertensive and diabetic patients were present in some personnel. This proportion was significantly more among non-medical workers. However it was interesting to note that a much higher proportion of paramedical workers had this misconception than the students. Relative lack of proper knowledge among paramedical workers highlights the need to dispel their misconceptions. This is vital as they will continue to be in the health sector and therefore will have at least an indirect impact on the programme as a whole. This is further evidenced by the fact that the misconception that the elderly were not to be given the tablets was highest among the paramedical workers. This misconception also prevailed more among the ones who were most experienced in the field as compared to the ones who were new to the programme. These observations highlight the areas where training needs to be emphasized upon in future rounds.

More than one fifth of participants stated that postings in MDA were interfering with their usual activities. This could mean that some of our personnel may not be sufficiently motivated to take up this important public health initiative. So in future rounds care has to be taken in selecting only highly motivated participants.

Only a small number of the participants chose to give any suggestions for programme improvement and of the ones who did, most felt that training had to be more extensive and the disease had to be dealt with in more detail. Another common suggestion was to increase awareness through improvement in information education and communication (IEC) activities. A few participants pointed out that the numbers of field personnel posted during MDA rounds are usually inadequate hence the government authorities need to increase the manpower. Also they complained that the honorarium given to them was too little and did not reflect the work involved in going house-to-house to distribute these tablets during MDA rounds.

This study has therefore highlighted areas in which MDA programme administrators need to work to improve the programme efficiency and to eliminate LF by 2015.

## Conclusion

Most participants in the study were posted for the first time in MDA activity and majority of them were students. Overall, knowledge of the participants was lacking in many aspects and this was reflected by their poor score in the study questionnaire and detection of misconceptions held.

The wrong notion that the drug should not be administered to the diabetics, hypertensives and elderly were prevalent among all types of workers. More alarming was its presence among the paramedical personnel. Some of the participants seemed to find the posting an inconvenience, however most appeared to have faith in the programme’s effectiveness to eliminate LF, which is good for the programme. These findings, and the suggestions for improvement provided by the participants, highlight the need to incorporate certain changes in the programme to improve efficiency especially in terms of better training not only for new workers but also experienced and health care staff. These measures will equip the personnel to be more efficient in clearing the doubts of the general public and may promote commitment, involvement and motivation of the target population thus potentially enhancing levels of drug consumption.

If other identified technical and administrative constraints are also addressed in an effective way, the elimination of LF can be made a reality, possibly even before the stipulated time of 2015.

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### ACKNOWLEDGEMENTS

The authors of this study would like to thank all participants for their cooperation in taking part in this study.

### PEER REVIEW

Not commissioned, externally peer reviewed

### CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

### Questionnaire

1. Designation .....
2. Gender .....
3. Age .....
4. Years of service .....
5. Years of experience in MDA against filariasis .....
6. What causes filariasis .....
7. What transmits filariasis from one person to another .....
8. What are the clinical features of filariasis .....
9. How to diagnose filariasis in laboratory.....  
Time of testing .....
10. What are the drugs given in MDA Drug 1 ....., and Drug 2 .....
11. Strength of 1<sup>st</sup> drug ..... mg. Dosage in various age groups ....., ....., .....
12. Strength of 2<sup>nd</sup> drug ..... mg. Dosage .....
13. What are the side effects of 1<sup>st</sup> drug .....
14. What are the side effects of 2<sup>nd</sup> drug .....
15. Who should not take these tablets .....
16. Why do we give these tablets .....
17. By which year is Government planning to eliminate filariasis .....
18. When will be the next round of MDA .....

19. Totally how many rounds of MDA will be conducted .....
20. What should be the minimum percentage of population coverage during MDA rounds .....%
21. Do you think MDA will be effective in eliminating filariasis yes/no
22. Does postings in MDA activity affect your other routine daily activities yes/no
23. What are the common responses of people to whom you gave drugs
  - a. ....
  - b. ....
  - c. ....
  - d. ....
24. Reasons stated by people for not accepting MDA
  - a. ....
  - b. ....
  - c. ....
  - d. ....
25. Any suggestions for improving this programme

### Answers to the study questionnaire and scoring system

6. Filarial worm (3 marks)
7. Mosquitoes (3 marks)
8. Fever, lymph node enlargement, elephantiasis, hydrocele (1x4=4 marks)
9. Blood smear, night (3+3=6 marks)
10. Drug 1: Diethylcarbamazine (DEC), Drug 2: Albendazole (5+5=10 marks)
11. 100 mg, 2 to 5 years – 1 tablet, 6 to 14 years – 2 tablets, above 14 years – 3 tablets (3+7+7+7=24 marks)
12. 400 mg, above 2 years onwards – 1 tablet (3+7=10 marks)
13. Headache, nausea, anorexia, weight loss, skin rashes, dizziness (1X6=6 marks)
14. Headache, nausea, dizziness, fever, hair loss, stomach pain, diarrhoea, skin rashes (1X8 = 8 marks)
15. Children below 2 years, pregnant women, chronically sick persons (3X5=15 marks)
16. Elimination of filariasis (3 marks)
17. 2015 (2 marks)
18. Next year (2 marks)
19. 5 to 7 rounds (2 marks)
20. 80% (2 marks)



### Scores

Maximum marks: 100

Must know questions no. 10, 11, 12, 13 (at least 2 side effects), 14 (at least 2 side effects), 15, 16 which total to 60 marks

Marks less than or equal to 60 is poor performance

Nice to know questions no. 17, 18, 19, 20, 13 (more than 3 side effects), 14 (more than 4 side effects) which totals to 15 marks

Marks between 85 (15 marks deducted from maximum possible marks) to 100 is good performance

Desirable to know questions : Rest questions

Marks between 61 to 84 is for satisfactory or average performance