

Factors Influencing Compliance on Mass Drug Administration for Elimination of Lymphatic Filariasis in Mawlamyaing Township, Mon State

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Lymphatic filariasis is one of the negligible tropical diseases. This study aims to determine the factors that influence the Mass Drug Administration (MDA) compliance for lymphatic filariasis elimination. A cross-sectional analytical study was carried out in urban area of Mawlamyaing Township, Mon State during April and May 2018. The study population was the most responsible person of the household (index person), those over 18 years old, living in Mawlamyaing Township. In this study, a total of 261 households were included. Index person of each household was asked with structured questionnaires. Based on the information provided by each index person, there were 1093 eligible persons to take MDA in these 261 households whereas the majority (75.1%) of eligible people took MDA. The age of the participants ranged from 18 years to 85 years with the mean (\pm SD) age of 44.5(\pm 13.3). Nearly two-thirds of respondents (65.9%) were Bamar where 80.5% of the index persons were female. The median monthly family income of the respondents was 250,000 kyats with inter-quartile range (150,000-300,000). Main reason for non-compliance was fear of side effects. Almost all respondents had correct knowledge about filariasis prevention. Attitude scores ranged from minimum 7 to maximum 28 with score of 7 to 20 regarded as poor attitude and score of 21 to 28 as good attitude; over half of the participants scored >20 marks for attitude. Association between race, knowledge and attitude of index persons and compliance of family members on MDA are statistically significant.

Keywords: Lymphatic filariasis, Mass Drug Administration

INTRODUCTION

Lymphatic filariasis is one of the neglected tropical diseases leading to the fourth most common cause of disability globally. It mainly damages the lymphatic system, causing the abnormal enlargement of body parts, causing pain, severe disability and social stigma.¹ Approximately 120 million people were already infected worldwide. It is also estimated that 1.3 billion people in more than 80 countries have been living in filariasis endemic area. The South-East Asia Region (SEAR) accounts for two-thirds of the world's filariasis endemic population,

being the highest burden of lymphatic filariasis among the six WHO Regions. The nine lymphatic filariasis endemic countries in the SEAR are: Bangladesh, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste.² In 2000, WHO launched the Global Program to Eliminate Lymphatic Filariasis (GPELF) setting the goal to eliminate lymphatic filariasis as a public health problem by the year 2020.¹ The WHO recommended Mass

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Drug Administration (MDA) as preventive chemotherapy strategy for lymphatic filariasis elimination as the transmission cycle can be interrupted when MDA is conducted annually for 4-6 years with effective coverage in filarial endemic area. MDA program is intended to involve all eligible persons living in all endemic areas with one of the following 3 regimens of safe, anthelmintic medicines: diethylcarbamazine plus albendazole (DA) in entire at-risk population; ivermectin plus albendazole (IA) in areas co-endemic for onchocerciasis; or albendazole preferably twice yearly in areas co-endemic for loiasis.³

In 2000, Myanmar had initiated WHO collaborative Global Programme to Eliminate Lymphatic Filariasis (GPELF) and Ministry of Health established the National Plan to Eliminate Lymphatic Filariasis (NPELF). This strategy was intended to eliminate lymphatic filariasis in 2020 (i.e. less than 1/1000 population) through Mass Drug Administration (MDA) using 2 drugs: Diethylcarbamazine and Albendazole (DA). MDA was started in 10 townships in Magwe Region as a pilot project in 2001.⁴

The MDA campaign was introduced in 2013 and designed for 5 years. Pregnant women, children under 2 year-old, and the severely ill persons are ineligible for MDA administration.³

In 2016, Myanmar became one of the countries where MDA program was scaled up to all endemic districts. According to the MOHS, 31 million people were reported to receive MDA by 36 implementation units in 2016, achieving 100% geographical coverage, 85% program coverage and 88.5% national coverage.⁵

This study was conducted in Mawlamyaing township, Mon State. This is because Mon State was at the second lowest MDA compliance (94.3%) in Myanmar and Mawlamyaing was the lowest among all townships of Mon State with 88.4%.⁵

In fact, the success of a MDA program depends on the achievement of high

coverage and good compliance in each of the implementation units. This study was mainly conducted to explore the factors that influence the compliance on MDA for lymphatic filariasis elimination. In this study, knowledge and attitudes on lymphatic filariasis among the study population, proportion of drug compliance among the residents and the reasons for not taking the MDA drugs were identified as well. By determining these factors, the ways to achieve elimination of lymphatic filariasis could be explored.

MATERIALS AND METHODS

Study design

A community-based cross-sectional analytical study was conducted.

Study area and periods

The study was conducted during April and May 2018. Mon State was purposively selected because it was the second lowest compliance on MDA program in 2016.⁵ The reason for conducting this study in Mawlamyaing Township was that it had the lowest MDA compliance in 2016 among all the townships of Mon State.⁵

Sampling

Required sample size for this study was determined by using the proportion of good compliance on MDA (63.1%) from a 2016 study done in Mandalay Region by Ei Ei Win, at 95% confidence interval ($z=1.96$).^{6, 7} The minimum required sample size was 250. In order to compensate information loss to incomplete data, a total of 261 participants were interviewed in this study. In order to participate in this study, the study population must be at least 18 years old and had been residing in Mawlamyaing Township for at least 6 months. Critically ill people, either physically or mentally, were excluded from this study. Those over 18 years old as well as the most responsible person of each household, so called the index person were given informed consent. Once the willing participants were well-informed

of the study purpose and signing the written informed consent, they were interviewed by using semi-structured questionnaires.

There are thirty-two wards in urban area of Mawlamyaing Township. Five wards of Mawlamyaing Township were selected by simple random sampling choosing fifty-two households from each ward. Then, households were selected by systematic sampling method by using sampling frame. When the selected household was not occupied by the index person at that time, the right adjacent household was selected.

Data collection methods and tools

Data was collected by face to face interview with pretested structured questionnaires in Myanmar language. The questionnaires were developed from literature review.^{6, 10, 11}

All the questions were pretested on 24 respondents in Yangon, checking the appropriateness for the study and convenience for the participants to answer. It was a total of 30 minutes required for each participant to answer all the questionnaires.

Data management and statistical analysis

After data collection, data checking was done daily for completeness and consistencies. Data entry was done by SPSS 22.0 software and after checking the missing data and inconsistencies, exploratory data analysis was performed. Then, for descriptive data analysis, frequency and percentage was calculated for categorical variables, mean (standard deviation) for normally distributed continuous variables, and median (inter quartile range) for continuous data without normal distribution. For statistical analysis, Chi-square test was used to examine the associated factors on MDA compliance. A p value of less than 0.05 was set as a cut-off point for statistically significant association.

Ethical consideration

Before data collection, ethical clearance was taken from the Institutional Review Board of University of Public Health with UPH-IRB (2018/MPH-G/3). The individual respondents

participated in this research voluntarily giving consent by signing consent form with the approval signs. Names of the participants were not included in the data collection. All the data were kept under strict confidentiality and will be destroyed one year after the research. All data files were protected by password.

RESULTS

The age distribution of the index person ranged from 18 to 85 years with the mean (\pm SD) age of 44.5(\pm 13.3 years), nearly 80 percent of them being female. One-fifth of the index persons were Mon. About 18 percent of respondents were above high school level.

Among 261 respondents, just over one-tenth of the study population (11.9%) knew the causal agent as parasites. However, the overwhelming majority (88.1%) stated that lymphatic filariasis (LF) could be transmitted by the bite of mosquitoes. *Culex* was named as the vector for LF by only 12.9% of them. Nonetheless, nearly 80% of the respondents could answer the breeding places of *Culex* mosquitoes.

Majority of the respondents (79.3%) answered that lymphatic filariasis could be curable in early stage. Almost all respondents (96.6%) answered that lymphatic filariasis could be preventable through MDA (98.4%) and by mosquito control (92.1%). Almost all (99.6%) of the index persons had ever heard about MDA program, getting information from health care providers (81.9%), visual media (32.3%), neighborhoods, friends and relatives (24.2%), community leaders (7.3%) and printed media (6.5%), respectively.

Regarding the total knowledge scoring, from minimum 0 to maximum 27, giving 1 mark for each correct response and 0 for each incorrect response, two-third of the respondents scored below 60% of maximum score (\leq 16 marks). Their knowledge score ranged from 1 to 25 with the mean (\pm SD) score of 13.9(\pm 4.1) and median score 14.

Attitudes towards LF and MDA were studied by 7 statements using Likert's type scale with minimum 7 and maximum 28. Those who scored 7 to 20 are regarded as having poor attitude and 21-28 as good attitude. Mean (\pm SD) score was 21.5(\pm 2.3), with the median 21. More than half of the respondents (54.8%) scored above 20 marks.

Half (50.6%) of the respondents agreed and nearly a quarter (23.4%) of the respondents strongly agreed that filariasis can occur in community. Nearly half (45.6%) of respondents agreed and 18.8% strongly agreed the statement "I can get filariasis". Over half (52.9%) of the respondents agreed and nearly half (43.7%) strongly agreed that MDA can prevent filariasis. Half of the respondents accepted that filariasis is socially stigmatized disease. Half (49%) of the respondents disagreed and one-third (33%) of the respondents strongly disagreed the statement "Other people can think that I have filariasis because of taking MDA". Most of the respondents (50.2% agreed and 47.1% strongly agreed) accepted that MDA program has to be successful for elimination of filariasis and it should be continued.

On receiving MDA drugs for this year, the overwhelming majority (93.8%) received them, mostly by home delivery. Over 60% of the respondents received MDA through health care providers. Most of the respondents (77%) were aware of MDA prior to and during drug distribution with the information received by means of door-to-door (74.7%) and loudspeakers (37.6%).

There were 1,325 household members in 261 households of this study. In accordance with the answers from each index person, at the time of MDA drug distribution, there were 70 individuals under two years, 24 pregnant women, 149 with comorbid conditions, or using other medications or severely ill, where some individuals had both of the contraindications towards MDA. Therefore, a total of 232 people were ineligible to take MDA at that time. Then, among all 1093 eligible individuals, 821 (75.1%) took MDA (Figure 1).

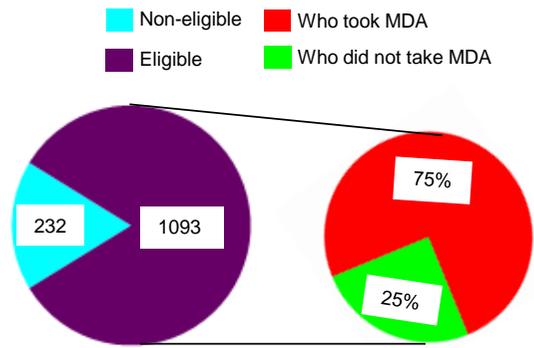


Fig. 1. Proportion of family members who took MDA among the eligible persons in Mawlamyaing, 2018(n=1325 individuals from 261 households)

As for compliance status of household level, no household member among the 17.2% of households with eligible persons took MDA. Only some household member among the 22.6% of households with eligible persons took MDA while all of the household members among the 60.2% households with eligible persons took MDA.

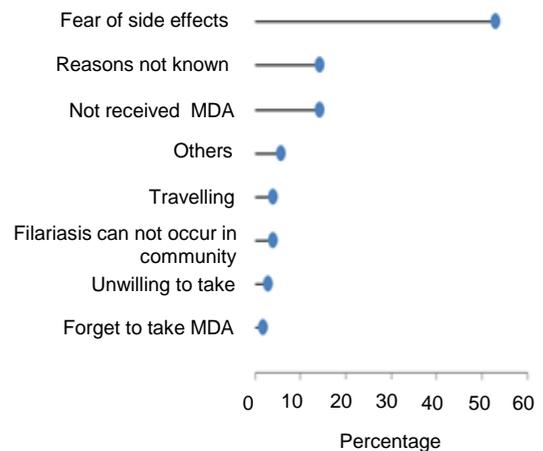


Fig. 2. Distribution of reasons for not taking MDA drugs in Mawlamyaing, 2018

When the reasons for the non-compliance have been explored, half of the respondents (53.1%) in this study did not take MDA due to fear of side effects, which became the major factor towards MDA compliance status, which was later followed by "not receiving MDA drugs" and "unknown reason" by (14%) each. Other reasons were the respondents considered themselves as

ineligible persons or they were dictated by the most powerful family member not to take it (Figure 2).

Table. 1. Association between socio-demographic characteristics of index person and MDA compliance of their household members in Mawlamyaing, 2018

Variables	All and some compliances n(%)	Non-compliances n(%)	Total n(%)	Chi-square	p value
Age group (year)				4.975	0.291
<30	20(74.1)	7(25.9)	27(100)		
30-39	70(89.7)	8(10.3)	78(100)		
40-49	51(78.5)	14(21.5)	65(100)		
50-59	44(83.0)	9(17.0)	53(100)		
≥60	31(81.6)	7(18.4)	38(100)		
Race				7.004	0.03*
Bamar	150(87.2)	22(12.8)	172(100)		
Mon	37(74.0)	13(26.0)	50(100)		
Others	29(74.4)	10(25.6)	39(100)		
Gender				0.249	0.618
Male	41(80.4)	10(19.6)	51(100)		
Female	175(83.3)	35(16.7)	210(100)		
Marital status				3.653	0.161
Single	29(72.5)	11(27.5)	40(100)		
Married	172(84.3)	32(15.7)	204(100)		
Divorce/ Widow	15(88.2)	2(11.8)	17(100)		
Education				2.126	0.547
Up to primary school	64(86.5)	10(13.5)	74(100)		
Middle school	62(84.9)	11(15.1)	73(100)		
High school	53(79.1)	14(20.9)	67(100)		
Above high school	37(78.7)	10(21.3)	47(100)		
Occupation				3.522	0.172
Dependent/ student/ house-wife	101(78.9)	27(21.1)	128(100)		
Own business	75(84.3)	14(15.7)	89(100)		
Manual worker/ private/ gov staff	40(90.9)	4(9.1)	44(100)		
Income level (kyats)				2.608	0.271
<150000	21(75.0)	7(25.0)	28(100)		
150000-300000	132(81.5)	30(18.5)	162(100)		
>300000	53(88.3)	7(11.7)	60(100)		
Family member				0.18	0.914
<5	97(82.2)	21(17.8)	118(100)		
5-7	98(83.8)	19(16.2)	117(100)		
>7	21(80.8)	5(19.2)	26(100)		

*statistically significant

In terms of socio-demographic characteristics, race of index person was found to be statistically significantly associated with the household compliance on MDA (Table 1).

Table. 2. Association between Knowledge level, Attitude level of index person and MDA compliance of household in Mawlamyaing, 2018

Variables	All and some compliances n(%)	Non-compliances n(%)	Total n(%)	Chi-square	p value
Knowledge score				5.039	0.025*
>16	64 (91.4)	6 (8.6)	70 (100)		
≤16	152 (79.6)	39 (20.4)	191 (100)		
Attitude score				4.801	0.028*
>20	125 (87.4)	18 (12.6)	143 (100)		
7-20	91 (77.1)	27 (22.9)	118 (100)		

*statistically significant

Statistically significant associations were found between knowledge, and attitude level of the index person and MDA compliance of households (Table 2).

DISCUSSION

In this study, Bamar respondents showed higher compliance (87.2%) compared to Mon (74%) and other races (74.4%).

The overwhelming majority of 88.1% and 96.5% of the respondents had correct knowledge about transmission and prevention of filariasis, which were higher than previous studies done in Chan-Aye-Thar-San Township in 2016 (66.4% and 80%), and in India in 2013 (15.3% and 17.6%).^{6, 8} Moreover, most (81.9%) of respondents mentioned the healthcare providers as the source of information in this study with half (50%) and 22%, in Mandalay and Peninsular Malaysia studies, respectively.^{6, 9} It was also observed that almost all respondents (99.9%) were aware of the MDA program, which is far higher than that of Peninsular Malaysia study (35.2%).⁹ This study population had better knowledge and awareness of the MDA program when compared with the previous studies done in India, 2013 and in Mandalay, 2016.^{6, 8} This was because it was three months prior to our study that the MDA drug distribution had been carried out in Mawlamyaing township.

On the other hand, regarding the non-eligible criteria for taking MDA, well over one-third (37.2%) of the participants answered pregnancy and a quarter (24.9%) of the participants knew under 2 years children as non-eligible for taking MDA. Therefore, health care providers should educate to the whole community about the contraindications of the MDA drugs.

In this study, 91.4% of the respondents with high knowledge score (>16 marks) had compliance. Likewise, in the studies done in Magway and in Sagaing, these studies consistently showed that respondents with high knowledge score consumed or accepted the drugs more than those respondents with low knowledge score did.^{10, 11} Furthermore, there was also significant association between attitude score of index person and compliance of MDA drugs by their eligible family members. Similarly, attitude was associated with MDA compliance in the previous studies done in Magway and in Indonesia.^{10, 12} On account of this, when the index persons had better knowledge and greater attitude level towards lymphatic filariasis and MDA program, they were more likely to encourage his or her family. In that way, compliance is improved.

When the compliance status of household on MDA was observed, it is nearly one-fifth of our study population that no household member among the households with eligible persons took MDA. All of the household members among the 60.2% of households with eligible persons took MDA in our study. The compliance rate from previous studies were 63.1% among 263 individuals in Chan-Aye-Thar-San Township, 70.1% among 603 individuals in India study, and 85.3% among 2859 individuals in Egypt study.^{6, 8, 13}

The reason why the compliance status of this study varied from other studies could be due to geographical difference and different socio-demographic characteristics of study population. Unlike the other studies, the compliance status in this study was calculated at the household level based on the answers from the index persons, not from each

individual household member. Perhaps this could lead to information bias.

Compliance status of the whole Mawlamyaing Township was reported to be 94.6%, however, this study revealed compliance rate as 75.1% which is the interviewed data.⁵ Although MOHS reported data on compliance of Mawlamyaing included both urban and rural areas, this study was carried out only in urban area. This could be root cause of different results. When the reasons for non-consumption of MDA were explored, fear of side effects and lack of detailed explanation about how and who should take MDA, and no information where to seek help if any adverse effect occurs were emphasized as the fundamental causes of their non-compliance. Some reasons also include travelling (not at home at the time of drug distribution) and unwillingness to take. Similar reasons were also found in India, in Sri Lanka.^{8, 14}

Interestingly, very few people in this study stated that they were dictated by the most powerful family member not to take the MDA drugs. Thus, healthcare providers should educate the importance and advantages of taking MDA, the major and minor side effects of MDA, information about proper care for those who suffered side effects.

Conclusion

The study noted that the relationship between knowledge and compliance of MDA drugs, attitude level and MDA compliance were statistically significant. With regard to reason for non-compliance of MDA drugs, it was indicated that fear of side effects as the main reason. Since the study was done only in urban area of Mawlamyaing Township, Mon State, similar studies are required to be carried out in other states and regions to identify the barriers to MDA compliance among the community for the elimination of lymphatic filariasis.

Competing interests

The authors declare that they have no competing interests.

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