

Original Research Article

A study on coverage and compliance of mass drug administration for lymphatic filariasis in Prayagraj District, Uttar Pradesh, India

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ABSTRACT

Background: Lymphatic filariasis is one of the six infectious diseases identified by the International Task Force for Disease Eradication as “eradicable” or “potentially eradicable. It is estimated that, to interrupt transmission of lymphatic filariasis, MDA compliance must exceed 65–75%. This study was conducted to assess coverage and compliance of mass drug administration for lymphatic filariasis in Prayagraj District.

Methods: This was a pre-tested, questionnaire based cross-sectional study. The study subjects (508) were selected randomly from rural (clusters of three villages) and urban (cluster of one ward) area of Prayagraj, Uttar Pradesh. Data was analyzed by using software SPSS version 23.0 and Chi-square test was used to test the association between the different variables. p-value less than 0.05 was considered as significant.

Results: The overall coverage rate, compliance rate, coverage-compliance gap and effective coverage rate of study population (eligible for MDA) in Prayagraj District were 69.94%, 84.19%, 15.81% and 58.88% respectively. The coverage rate and effective coverage rate were 78.71% and 64.85% respectively among urban area as well as 66.99% and 56.88% respectively among rural area.

Conclusions: The coverage rate and effective coverage rate were higher among population in urban area as compared to rural area while compliance rate was lower and hence coverage-compliance gap was higher among population in urban area as compared to rural area. The most common reason for not consuming drugs was ‘drugs not delivered by drug distributors’ (73.11%).

Keywords: Coverage rate, Compliance rate, Effective coverage rate, Lymphatic filariasis, MDA

INTRODUCTION

Lymphatic filariasis (LF) is a chronic and debilitating disease that affects people in tropical and sub-tropical areas of Asia, Africa, Western Pacific and some areas of the United States of America. The disease is caused by the parasites *Wuchereria bancrofti* (*W. bancrofti*), *Brugiamalayi* (*B. malayi*) and *Brugiatimori* (*B. timori*), transmitted by the vector *Culex*, *Anopheles* and other mosquitoes.^{1,2} Lymphatic filariasis is one of the six infectious diseases identified by the International Task Force for Disease Eradication as “eradicable” or “potentially eradicable”.³ LF has therefore been targeted

for elimination by the WHO. In recognition of its eradicability, in 1997, World Health Assembly resolved to eliminate lymphatic filariasis as a public health problem. In response, the World Health Organization (WHO) established the Global programme to eliminate Lymphatic Filariasis (GPELF) to assist Member States in achieving this goal by 2020.⁴

Globally, an estimated 25 million men suffer with genital disease and over 15 million people are afflicted with lymphoedema. South East Asia Region of WHO has the highest disease burden among all WHO regions, with 9

out of 11 member countries in the region being endemic for the disease.⁵

In India, As on 2018, a total of 12,98,233 Lymphatic Filariasis cases were reported from 16 States and 5 UTs, wherein Lymphoedema and Hydrocele cases are 9,03,835 and 3,94,398 respectively. Till December 2018, a total of 1,48,736 hydrocelectomy operation were reported under morbidity management from 16 States and 5 UTs.⁶ The circulating microfilariae transmit the disease via blood of patients. Therefore, to reduce transmission, the communities were kept on annual mass drug administration (MDA) for 4-6 years reaching up to 80% coverage of the entire population at-risk aiming to reduce mf loads to zero or close to zero.⁷

The main objective of National Health Policy 2002 was to eliminate of lymphatic filariasis by 2015. The strategy for achieving the goal of elimination is by Annual Mass Drug Administration of DEC 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.⁸ To achieve elimination of lymphatic filariasis, Government of India during 2004 launched campaign of mass drug administration with annual single recommended dose of DEC, in addition to scaling up home based foot care and hydrocele operations. Later on, co-administration of Albendazole with DEC was introduced in 2007 and scaled up in all endemic districts across country⁽⁵⁾. The Ministry of Health & Family Welfare has approved the Triple Drug Therapy (IDA) implementation programme in selective five districts i.e. Arwal (Bihar), Simdega (Jharkhand), Varanasi (Uttar Pradesh), Nagpur (Maharashtra) and Yadgir (Karnataka).⁹ Triple Drug Therapy was initiated also in Prayagraj in MDA round 2019-20.

It is estimated that, to interrupt transmission of lymphatic filariasis, MDA compliance must exceed 65–75%. When a considerable proportion of the population fails to comply with the MDA, a potential reservoir for the parasite remains untreated, thus opening the door to recrudescence of microfilaraemia and reducing the chance of the programme's success.⁹

In several states, implementation of MDA is irregular, with extended intervals between MDAs or MDAs being skipped. Compliance with the MDA is inadequate in several endemic areas. Many studies have highlighted the large gap between MDA coverage and compliance. Therefore, there is always a need for the independent assessment of reported figures by an external agency so as to give a clear picture of ground reality.^{10,11}

Although many studies have been done for assessing MDA coverage and compliance in India and in Uttar Pradesh also but no such study has been done in Prayagraj District. Hence, this study was conducted with the objectives to assess coverage & compliance of mass drug administration for lymphatic filariasis in Prayagraj District.

METHODS

This study was given approval by the institutional ethics committee, M.L.N Medical College, Prayagraj. It was a community based cross-sectional study that was carried out in rural and urban areas of Prayagraj District from May 2019 to May 2020. Multistage Cluster random sampling was done in this study. Listing of total 80 wards in urban area of Prayagraj and listing of total 20 CHC/PHC in rural area of Prayagraj was done and all wards and CHC/PHC were classified into low, medium and high on the basis of drug distribution coverage carried out in Prayagraj District in 2019. In first stage, one ward was selected randomly from medium category and one CHC/PHC was selected randomly from each low, medium and high category. In second stage, one sub-centre was selected randomly from each selected CHC/PHC. In third stage, a cluster of required households was selected from villages under the respected sub-centers in order to meet the required sample population from those villages. Finally, the households of selected clusters were visited. The selection of starting point of households was done by pen drop method and study subjects was examined and interviewed till the required sample size was met.

Informed consent was taken from the study subject after explaining the purpose and objective of the study. The information about MDA Coverage and MDA Compliance was taken by informant (a family member) in case of absence other Family members. The collected information was recorded on a pretested and pre-designed questionnaires. Data was analyzed by using software SPSS version 23.0 and Chi-square test was used to test the association between the different variables. p-value less than 0.05 was considered as significant.

Inclusion criteria

The entire population at risk of Lymphatic Filariasis transmissions.

Exclusion criteria

Children less than 2 years, pregnant women, lactating women, seriously ill patient and those persons not willing to participate were excluded.

RESULTS

A total 805 study populations (eligible population) was included in the study of which 603 belonged to rural area and 202 were from urban area. It can be seen that in present study of Prayagraj District, the study population (eligible for MDA) was distributed as 5.10% in 2-5 years age group, 14.91% in 6- 14 years age group and majority, i.e. 80% were aged 15 years and above. The male and female distribution of study population (eligible for MDA) was 53.79% and 46.21% respectively.

Table 1: Age and gender wise distribution of study population (eligible for MDA).

Age in years (N=805)	Rural (N=603)		Urban(N=202)	
	Males (n=325)	Females (n=278)	Males (n=108)	Females (n=94)
	N (%)	N (%)	N (%)	N (%)
2-5 years (n=41)	18 (43.90)	12 (29.27)	7 (17.07)	4 (09.76)
6-14 years (n=120)	50 (41.67)	45 (37.50)	13 (10.83)	12 (10)
≥15 years (n=644)	257 (39.90)	221 (34.32)	88 (13.66)	78 (12.11)

Table 2: Coverage rate, compliance rate and coverage–compliance gap and Effective coverage rate among study population (eligible for MDA).

Study Area of District Prayagraj	Eligible Population	IDA* given by DD** (Coverage rate) during study		Consumed (Compliance rate)		Coverage-Compliance gap		Effective Coverage rate	
		N	%	N	%	N	%	N	%
Chhitpur (Urban)	202	159	78.71	131	82.39	28	17.61	131	64.85
Bundawa (Rural)	201	143	71.14	121	84.61	22	15.38	121	60.20
Naini (Rural)	201	138	68.65	119	86.23	19	13.77	119	59.20
Singhapur (Rural)	201	123	61.19	103	83.74	20	16.26	103	51.24
Total	805	563	69.94	474	84.19	89	15.81	474	58.88
Chi-square, p value		Chi-square=9.8762, p-value=0.0017, significant		Chi-square=0.5405, p-value=0.4622, not significant				Chi-square=3.9691, p-value=0.0463, significant	

(*IDA= Ivermectin, DEC, Albendazole, **DD= Drug Distributor)

Table 3: Reasons for not consuming drug.

Reason	Rural (603)		Urban (202)		Total (805)	
	N	%	N	%	N	%
Drugs not delivered by DD	199	76.53	43	60.56	242	73.11
Fear of side effect	17	06.54	9	12.68	26	07.85
Too many medicines	13	05.00	5	07.04	18	05.44
Difficult to engulf	2	00.77	1	01.40	3	00.91
No disease then why will take drugs	29	11.15	13	18.31	42	12.69
Total	260		71		331	

The coverage rate, compliance rate, coverage-compliance gap and effective coverage rate in urban area were 78.71%, 82.39%, 17.61% and 64.85% respectively. Similarly, the coverage rate, compliance rate, coverage-compliance gap and effective coverage rate in rural area were 66.99%, 84.86%, 15.10% and 56.88% respectively. The coverage rate and effective coverage rate were higher among urban (78.71% and 64.85% respectively) as compared to rural (66.99% and 56.88% respectively) but compliance rate was lower and hence coverage-compliance gap was higher among urban (82.39% and 17.61% respectively) as compared to rural (84.86% and 15.10% respectively). The overall coverage rate, compliance rate, coverage-compliance gap and effective coverage rate of study population in Prayagraj District were 69.94%, 84.19%, 15.81% and 58.88% respectively.

Here, statistically significant difference was found between coverage rate of rural and urban area (Chi-square=9.8762, p<0.05, significant). Statistically significant difference was also found between effective coverage rate of rural and urban area (Chi-square=3.9691, p<0.05, significant). No statistically significant difference was found between the compliance rate of rural and urban area (Chi-square=0.0114, p>0.05, not significant).

It was seen that overall 331 (41.12%) study subjects (eligible for MDA) did not consume drugs out of 805. In urban area, 71 (35.15%) study subjects out of 202 and in rural area, 260 (43.12%) study subjects out of 603 did not consume drugs. The main reason for not consuming drugs among both rural and urban area was “drugs not delivered by drug distributors”, i.e. 199 (76.53%) out of 260 and 43

(60.56%) out of 71 respectively as they did not receive any drug. Further, in rural area, 29 (11.15%) people claimed no need of taking drugs when there is no disease, 17 (6.54%) were afraid of side effect and 13 (18.31%) said that these were too many medicines to consume out of 260. And now further in urban area, 13 (18.31%) people claimed no need of taking drugs when there is no disease, 9 (12.68%) were afraid of side effect and 5 (7.04%) said that these were too many medicines to consume.

DISCUSSION

In this present study of Prayagraj District, the study population (eligible for MDA) was distributed as 5.10% in 2-5 years age group, 14.91% in 6- 14 years age group and majority, i.e. 80% were aged 15 years and above. Similar demographic profile was found in the study conducted by Singh et al. (2015) who found that of the total study population (eligible for MDA), 9.8% were in age group 2-5 years, 25.3% were in 6- 14 years age group and 64.9% were aged 15 years and above in selected four districts (Lucknow, Sitapur, Rae-Bareilly and Hardoi) of Uttar Pradesh. Gowda (2012) conducted a study in Bidar District, Karnataka and found that among study population (eligible for MDA) 7.5% in 2-5 years age group, 18% in 6- 14 years age group and 73.71% were aged 15 years and above.^{12,13}

In our study the male and female population was 53.79% and 46.21% respectively in Prayagraj District. Singh et al. (2015) found this proportion to be 52.8% males and 47.2% females in their study which was almost similar that of present study.¹² Sinha et al. (2018) carried out a comparative analysis in a District of West Bengal, India and found that male and female population was 48.82% and 51.18% respectively in eligible population.¹⁴ The proportion of male and female in all these studies is more or less similar with slightly lesser percentage of females in UP and slightly higher percentage of females in West Bengal.

Lymphatic Filariasis had been widely prevalent and is a serious public health problem in India. According to the estimates made in 1994, India alone accounts for 43% of the global infected population (WHO, 1994). Five to 6 rounds of annual MDA are required to interrupt transmission of LF. Each round of MDA should be 'effective' i.e., at least 65% treatment coverage should be accomplished.¹⁵ Though the programme made significant progress and covers the entire endemic population, there exist several concerns and challenges, which require resolution in the coming years. In this present study, the coverage rate (the distribution of drugs to eligible population by drug distributor) was 69.94%, the compliance rate (actual consumption of drugs by eligible population) was 84.19%, coverage compliance gap (difference between coverage and compliance) was 15.81% and effective coverage rate (net consumption of drugs by eligible population) was 58.88%.

The coverage rate, compliance rate and effective coverage rate in the present study was higher in comparison of Singh et al. (2015) who found the overall drug coverage of Mass Drug Administration in selected four district (Lucknow, Sitapur, Rae-Bareilly and Hardoi) of Uttar Pradesh for Lymphatic Filariasis was 64.8%, The compliance was 72.5% and effective coverage was just 47.0% in their study.¹² The reason for this may be the difference in the time when study was conducted. It is clear that over the years, the effective coverage has increased. Kulkarni et al found coverage to be 80.3% and compliance to be 72.5% in Vijayapura (Bijapur) District of Karnataka which was higher than the present study.¹⁶ Ganapa et al reported coverage rate and compliance rate 79.84% and 84.6% respectively in Nalgonda district of Telangana which was also higher than the present study.¹⁷ Kulkarni et al conducted a study in Bagalkot District Karnataka and found coverage rate was 93.9% and effective coverage rate (compliance) was 83.2%.¹⁸ The coverage compliance gap was 10.7%. The coverage rate and effective coverage rate both were higher in these studies than our present study may be due to better state of awareness and education in south India.

In present study, the coverage rate, compliance rate, coverage-compliance gap and effective coverage rate were 78.71%, 82.39%, 13.86% and 64.86% respectively in urban area and 66.99%, 84.86%, 10.14% and 56.88% respectively in rural area. Similar study was conducted in Nayagarh District of Odisha by Bhatia et al and found that the effective coverage rate was 77.8% in rural areas which was higher as compared to present study and 48.8% in urban areas, was lower as compared to present study.¹⁹ This result may be due to different study settings. Also Rajkumar et al found that the coverage rate was 68% in rural population and 18% in urban population.²⁰ The drug compliance was 81% in rural and 87% in urban. The effective coverage was only 57.7% in rural and 16% in urban population. Here the coverage rate and effective coverage rate among urban area were much lower as compared to present study. These results may be due to ignorance of urban population towards this issue and a false sense of security and belief that this disease affects those residing in rural areas more. Babu and Babu (2014) found in a meta-analysis that, in India, coverage rates varied between 48.8% and 98.8%, while compliance rates varies from 20.8% to 93.7%.²¹ They observed a wide gap between the coverage and compliance in MDA programme. These scenario may be due to ignorance by people, less interest on part of drug distributors, less education level, lack of awareness, public not considering the disease seriously etc.

The coverage rate and effective coverage rate of present study was higher among urban than rural but compliance was lower and thus coverage-compliance gap was higher among urban than rural. The reason for higher coverage rate and effective coverage among urban than rural was that it might have been convenient to reach the population in the urban area for drug distributors than rural area and

the lower compliance and higher coverage-compliance gap among urban than rural shows that probably, motivation for drug consumption was more easy among rural population and they were easily convinced by drug distributors.

CONCLUSION

The present study was conducted on study population (eligible for MDA) of Prayagraj District in rural and urban areas. The overall coverage rate, compliance rate, coverage-compliance gap and effective coverage rate of study population (eligible for MDA) in Prayagraj District were 69.94%, 84.19%, 15.81% and 58.88% respectively. The coverage rate and effective coverage rate were higher among urban area as compared to rural area while compliance rate was lower and hence coverage-compliance gap was higher in urban area as compared to rural area. The most common reason for not consuming drugs was 'drugs not delivered by drug distributors' (73.11%).

Recommendations

The focus of the IEC regarding lymphatic filariasis and its prevention should be on the seriousness of diseases. It should be told to both public as well as drug distributors. Proper training of drug distributors is very important because they interact directly with public for distribution of drugs. Drug distributors should be trained to cover each and every house with eligible population by going door to door and ensure the consumption of drugs in their presence. Training of drug distributors should be comprehensive and it should also focus on increasing their patience and resilience so that they can solve all the queries of public related to lymphatic filariasis, mass drug administration, side effect of drugs and its management and thus increase compliance.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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