Original Article

Assessment of Mass Drug Administration for Elimination of Filariasis in 'Tribal' Blocks of Bankura District, West Bengal

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Abstract:

Introduction: Independent evaluation of MDA for Filariasis elimination in 'tribal' blocks of Bankura district, West Bengal was not available. In the event of likely elimination of Filariasis in forthcoming year(s), it was thought a necessity. **Objectives:** To assess coverage and compliance to MDA with factors associated and awareness regarding filariasis and MDA in 'tribal' blocks of Bankura district of West Bengal. **Methods:** Cross sectional observational community based study on 120 families (600 people) selected by standard (WHO) 30 cluster technique during January-March 2017 in 06 'tribal' blocks the district (total population = 793176, tribal population = 213412). House to house survey was done with a pre designed pre-tested questionnaire. **Results:** In spite of a large (32.2%) illiterate population, the overall coverage (95%) and compliance (90.8%) were satisfactory although directly observed compliance (7%) was poor. These were not *statistically significant* ($p \geq 0.05$) for age, sex, caste, education and occupation. Primary reason for non coverage, non compliance and non directly observed compliance were absence from home (100%), forgetfulness (64%) and empty stomach (66.7%) respectively. Although there was satisfactory awareness on Filariasis (84.2%), for MDA, it was poor (3.3% only).**Conclusion:** Very good level of coverage and compliance of MDA was observed in line with NVBDCP in spite of very poor awareness of MDA. To make it universal, Improved IEC for filariasis and importance of drugs consumption and change of timing of drug distribution to ensure directly observed compliance should be considered..

Key words: MDA, 'Tribal Block', Bankura, West Bengal.

Introduction:

Lymphatic Filariasis (LF), one of the most debilitating and disfiguring among all diseases, currently affects more than 12 crore persons in about 73 countries in the world, predominantly the tropics and sub-tropics of Asia, Africa, the Western Pacific, and parts of the Caribbean and South America.[1] Of these, about 65% reside in WHO's South East Asia Region(SEAR) and about 4 crore being disfigured and incapacitated by this disease.[2] India accounts for about 40% of global burden with loss of about 2.06 million disability adjusted life years (DALY), resulting in an annual wage loss of US$ 811 million.[3]

Following 50th World Health Assembly resolution (WHA 50.29; 1997) to eliminate LF as a public health problem,[4] the first Mass Drug Administration (MDA) campaign was started in 1999-2000 with launching of Global Program to Eliminate Lymphatic Filariasis (GPELF)[5] MDA involves once a year administration of the drugs Di-Ethyl Carmazine (DEC) 6 mg/kg + 400 mg Albendazole to at least 65% of at risk population for at least 5 years. After a prior piloting in 1996-97, it was also started in India as part of National Filaria Control Program (NFCP) and further strengthened in National Vector Borne Disease Control Program (NVBDCP, 2004) with the objective of a high coverage of MDA (>85%) sustained for consecutive five years or more to all at risk population excluding children below two years, pregnant women and seriously ill persons.[6] Bankura district in West Bengal, one of the few districts in the state having large proportion (more than 10%) of tribal

population[7] with relatively poor health infrastructures and services. The MDA program was also being implemented in West Bengal with an official coverage of 83.16% in 2014 [8] and 75.6% in Bankura district in 2015 [9] However, no independent evaluation was done for this program in such population ever. With this background, present study was carried out in 'tribal' blocks (overall tribal population ≥ 25%; as considered in Enhanced Malaria Control Project 1997 [10]) of Bankura district of West Bengal with objective of assessing coverage and compliance to MDA with factors associated and awareness regarding filariasis and MDA.

Materials and Methods:

This cross sectional observational community based study was conducted by house to house visits in 30 villages (WHO 30 cluster sampling technique [11]) in 06 (six) 'tribal' blocks of Bankura district of West Bengal during January-March 2017 with the help of a predesigned schedule. *Data pertains to MDA done in August 2016* in those areas. Study subjects were all persons except children below 2 years, pregnant women and seriously ill persons.

Sample size was calculated considering Bankura district coverage of MDA (75.6%) [9] With 95% confidence and 7.5% precision (relative), the sample size came to be 220. Considering a design effect 2 for cluster sampling and 10% non response allowance, the final sample size was 484 (rounded off to 480). Considering an average family size of 04 (four) for ≥02 years, 120 families were the study families with a cluster sample size equals to 4 families. Probability Proportional to Size (PPS) technique was used to select 30 clusters (villages) from a total of 1062 villages of **06 blocks** (*Sarenga, Raipur, Ranibandh, Khatra, Hirbandh and Chhatna*) with a total study population of 793176 and tribal population of 213412 (26.9%). [12] Families in a cluster were selected by Simple Random Sampling. Final sample size came to be 600 persons ≥2 years age from 120 families.

With the help of pre-designed schedule, information was collected by DPH (Diploma in Public Health) Junior Resident from household *informants* (senior most or any other knowledgeable family member) regarding their sociodemographic characteristics (age, sex, caste, education and occupation), coverage and compliance to MDA including directly observed compliance (in front of drug administrator) and primary reason for non coverage and non compliance. Verbal informed consent was taken from the informants after proper explanation and assurance regarding the purpose of data collection, confidentiality of personal information including their right to refuse any information.

A data base was created in Ms-Excel spreadsheet and analysed with the help of open source R software. Appropriate tabulation, proportion(percentage) were used for data analysis. Chi square test was used for testing significance as applicable with $p < 0.05$ as significant. In this study, 'Coverage' was considered as proportion of eligible subjects *received* the tablets and 'Compliance' was considered as proportion of eligible subjects *consumed* the tablets.

Results:

The sociodemographic characteristics of the *Informants* (N=120) show that majority belong to the age group of 35-59 years (87, 55.8%) with 22 (18.4%) being senior citizens. Most of the informants were male (93, 77.5%), belonging to Scheduled Tribe (56, 46.7%) followed by General caste (43, 35.8%) and from joint families (93, 77.5%) with majority (98, 81.7%) belonging to lowest social class (Prasad's Class V [13] having per capita income < Rs. 952/month). All the informants and study subjects belong to Hindu religion.

Table 1. Distribution of study subjects to their Sociodemographic Characteristics (N=600)

Characteristics	Number (%)
1.Age	
0-4	38 (6.3)
5-9	59(9.8)
10-19	116(19.3)
20-34	146(24.4)
35-59	182(30.4)
=60	59(9.8)
2.Sex	
Male	295(49.1)
Female	305(50.9)
3.Caste	
Scheduled Tribe	260 (43.33)
Scheduled Caste	121 (20.17)
General	219 (36.50)
4.Education (n-534, =7yrs)	
Illiterate	172 (32.2)
Up to primary	48 (9.0)
Middle school	130 (24.3)
Secondary & HS	152 (28.5)
Graduate	32 (6.0)
5.Occupation(n=452,=14 yrs)	
Unskilled/Agricultural labour	31 (6.9)
Skilled labour/Service	84 (18.6)
Cultivator	183 (40.5)
Business/Shop owners	07 (1.5)
Student	53 (11.7)
Homemaker	60 (13.3)
Others/Unemployed	34 (7.5)

Table 1 shows that majority of the study subjects belong to 35-59 years age (30.4%) with 38 (6.3%) under fives, 116 (19.3%) adolescents and 59 (9.8%) senior citizens. Sex wise, they are almost equal with majority belong to Scheduled Tribe (260, 43.33%) having cultivator as occupation (183, 40.5%). As a group, *illiterates* (172, 32.2%) were majority followed by secondary and higher secondary education combined (152, 28.5%)

Table 2.Distribution of study subjects according to coverage and compliance to MDA drugs

Characteristics	Number (Percentage)
1. Coverage (receipt of drugs) [N=600]	570 (95)
2. Compliance (consumption of drugs) [N=570]	545 (95.6)
	[90.8% of total]
3. Directly observed compliance [N=545]	42 (7.7)
	[7% of total]

Table 3.Primary reason for non coverage,non compliance and non directly observed compliance to Drugs

Characteristics	Number (Percent)
1. Non receipt of MDA drugs [N=30]	
- Not at home	30 (100)
2. Non consumption of MDA drugs [N=25]	
- Forgot to take drugs	16 (64)
- Others	9 (36)
3. Non directly observed consumption of MDA drugs [N=503]	
- Not at home	54 (17.4)
- Empty stomach	363 (66.7)
- Others	86 (15.9)

The coverage (receipt of drugs), compliance (consumption of drugs) and directly observed drug consumption are depicted in **table 2**. It shows that, overall, 570 (**95%**) study subjects received MDA drugs (Diethylcarbamazine and Albendazole) and 30 (5%) did not.

Overall, out of 570 persons received the MDA drugs, 545 (95.6%, 90.8% of total) consumed the drugs. Regarding drug consumption in front of the drug administrators, only 42 (7.7%, 7% of total) persons had directly observed compliance. This receipt and consumption of MDA drugs was analysed according to various *socioeconomic variables* of the study subjects e.g. age, sex, caste, education and occupation and it was *statistically insignificant* for all variables. (p≥0.05).

The reasons for non coverage, non compliance and non directly observed compliance is presented in *table 3*. Absence from home was the sole reason (100%) for not receiving the drug. As such, there was no refusal. The primary reason for non consumption was forgetfulness (16, 64%) while the major reason for non consumption in front of drug administrator was empty stomach (363, 66.7%).

The awareness of the informants regarding filariasis and MDA shows that there is better general awareness regarding filariasis (84.2%) but practically very little awareness for MDA program (3.3% only) A very high illiteracy (32.2%) coupled with inadequate IEC measures might be the reasons for this.

Discussion:

Although, India was supposed to be eliminated from Filariasis in 2015, [14] it has not yet been succeeded. Studies on assessment of MDA are also available since 1999 to mostly up to 2012 in West Bengal and many states of India.[15-25] However, for reasons unknown, studies in recent times are not readily available.

Present cross sectional observational community based study on MDA coverage, compliance and awareness on filariasis and MDA in 'tribal' blocks of Bankura district of West Bengal in 2017 revealed that there was high (**95%**) coverage of MDA (=receipt/distribution of drugs), even higher than that of overall Bankura district (75.6%). It reveals that there was neither any general resistance against MDA nor there was any major absence of family member from household. Similar high coverage (98.8%) was also observed by Ghosh S et all in Bankura district, West Bengal in 2012. [15] Recommended coverage (≥ 85%) was also observed from 06 districts of Gujarat in 2006 by Kumar P et al. [16] Most of the other available studies observed less than recommended coverage e.g. in North 24 Parganas district in West Bengal (83.4%) by Halder D et all in 2012, [17] in three districts of Tamilnadu (80%) by Ramaiah KD et all in 1999, [18] in Ernakulam district of Kerala (77.0%) by Aswathy S et all in 2007-08, [19] in two villages of Pondicherry (76.2%) by Mahalakshmy T et all in 2008, [20] in Udupi district of Karnataka (73.4%) by Kumar A et all in 2007, [21] in North 24 Parganas district of West Bengal (72.87%) by Karmakar PR et all in 2010, [22] in five districts of Andhra Pradesh (69.96%) by Mukhopadhyay et all in 2006-07 [23] and in four costal districts of Orissa (67.05%) by Babu BV et all in 2002. [24] A relatively poor coverage (48.76%) was observed by Roy RN et all in Burdwan district of West Bengal in 2010. [25]

Present study observed *no association* of receipt and consumption/compliance of drug with sociodemographic variables. Rural residence was observed to be associated with better receipt and compliance of drugs in Bankura [15] and North 24 Parganas [17] districts, West Bengal and in Tamilnadu [18] and Kerala. [19] Present study being an exclusively rural study, corroborates these findings.

Primary reason (100%) for non coverage in this study was *absence from home*. Apart from this, reason(s) found in other studies are no distribution of drugs,[16,18,24] inadvertent distribution time,[18] refusal to take drugs thinking it unnecessary and fear of side effects.[16,24]

But only coverage is not enough. It is the *Compliance* (= consumption of drugs) and resulting *Effective Coverage* (= coverage x compliance) is more important. Present study observed a high Compliance/Effective Coverage of 95.6%/90.8%. Similar high figure (95.7/95.3) was also obtained by Ghosh S et all in Bankura, West Bengal.[15] Moderate figures are available from six districts of Gujarat (90.6/76.2),[16] two villages of Pondicherry (88.7/67.6),[20] Udupi district of Karnataka (85.6/62.8)[21] and North 24 Parganas district, West Bengal (70.47/51.35).[22] Relatively poor figure was observed in rest of the studies e.g. 61.28/48.01 in North 24 Parganas, West Bengal,[17] 64.64/45.22 in five districts of Andhra Pradesh,[23] 53.5/42.8 in three districts of Tamilnadu,[18] 70.07/34.16 in Burdwan district, West Bengal,[25] 39.6/30.49 in Ernakulum district of Kerala[19] and 41.57/27.8 in four costal districts of Orissa.[24]

A very important element of compliance is "directly observed" compliance e.g. consumption of drugs in front of the drug distributor. It was only 7.7% (Effective 7%) in this study. This aspect was not adequately covered in most studies. It was observed to be almost nil by Halder D et all in 2012 in North 24 Parganas district ,West Bengal,[17] less than one third in Bankura district of West Bengal[15] and only 1.8% by Mahalakshmy T et all in 2008 in two villages of Pondicherry.[20]

Primary reason for non compliance in this study was stated to be forgetfulness (64%) and that of non directly observed compliance was empty stomach (66.7%). Although, forgetfulness was observed to a reason in Gujarat,[16] more predominant reasons cited by many studies were fear of side effects,[15, 17-19, 21, 22, 24, 25] refusal without any reason,[16] absence from home,[15, 22, 24, 25] inadequate counselling,[22] felt unnecessary (unaware of its importance, no faith or having misconceptions),[18,19,21,22,24,25] and illness.[19,24] The reason(s) for non directly observed compliance could not be compared for lack of comparable figures.

Present study also observed that 84.2% of the informants were *aware of filariasis disease* but only 3.3% were about *MDA*. This disproportionate gap between awareness of filariasis and MDA might be due to poor IEC. The best filarial awareness (95%) was observed from Udupi, Karnataka.[21] Relatively better awareness was observed from Andhra Pradesh (64.67%),[23] and districts of West Bengal e.g. North 24 Parganas (64%),[17] Bankura (60%)[15] and Burdwan (52.67%).[25] A poor figure (42.98%) was also observed from North 24 Parganas district of West Bengal.[22]

Regarding *awareness of MDA*, better figures were from Udupi, Karnataka (88.5%),[21] and three districts of Tamilnadu (82.5%).[18] Moderate awareness was observed from Bankura (66.9%),[15] North 24 Parganas (60%)[17] and Burdwan (58.02%)[25] districts of West Bengal and five districts of Andhra Pradesh (53.66%).[23] Relatively poor awareness on MDA was observed from Ernakulam district of Kerala (32.6%)[19] and North 24 Parganas district of West Bengal (21.08%).[22]

Conclusion and Recommendation:

Present study observed very good level of coverage and compliance of MDA in 'tribal' blocks of Bankura district of West Bengal in line with NVBDCP in spite of very poor awareness of MDA. To make it universal, following steps may be taken as per observation of the present study; i)Improved IEC for MDA awareness and importance of drugs consumption, ii) change of timing of drug distribution to ensure directly observed compliance avoiding empty stomach.

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