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Coverage and compliance to diethylcarbamazine in relation to Filaria Prevention Assistants in rural Puducherry, India

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India is committed to eliminate filariasis by 2015. To achieve this goal annual mass drug administration (MDA) of diethylcarbamazine (DEC) was launched in 2004 by the Government of India[1,2]. According to the guidelines, DEC should be administered under supervision to all people excluding children <2 yr, pregnant women and severely ill persons (non-eligible). The recommended DEC dosage is one tablet (100 mg) to children of age 2–5 yr, two tablets for 6–14 yr age group, three tablets for those ≥ 15 yr of age[3]. In Puducherry, MDA programme is successful with 97% coverage rate and the microfilaria rate decreased from 0.42% in 2004 to 0.05% in 2008[4]. However, further success depends on effective communication strategy of the drug distributors to improve compliance[2]. DEC is distributed by filaria prevention assistants (FPA)–health workers, *Anganwadi workers* and volunteers such as women self help group members and *Panchayat* members. FPA are expected to ensure optimum consumption by: (i) enumerating family members; (ii) preparing them for MDA; (iii) administering DEC; (iv) ensuring supervised consumption; (v) referring subjects with side reactions to Primary Health Centre; and (vi) submitting report. We evaluated the adherence of filaria prevention assistants to the national guidelines. This information will be useful for future planning and training of FPA.

This cross-sectional study was undertaken in two feasibly selected villages (Koonichampattu and Vadanoor) of rural Puducherry, having a total population of 5172. Considering 6% difference in compliance rate[5] the calculated sample size was 1444 with α error of 5% and relative precision of 5%[6]. As this constituted to around 30% of the study population, every third house was systematically selected for the study. After obtaining oral informed consent, trained medical undergraduates, interviewed either the head of the family or his wife within one month of administration of 2008 MDA (November) using a pre-designed and pre-tested structured questionnaire. He/She was taken as the proxy respondent for all the family members. The interviewers assessed the eligibility of the household members for receiving DEC. Information about the drug distributor, number of DEC tablets given, that consumed and time of consumption was collected. Five percent questionnaires were rechecked for completeness by the faculty of Department of Community Medicine. By following this procedure the team collected data from 289 houses with 1282 individuals and 73 houses were found locked. Data were analyzed using SPSS Version 13. Nandha *et al*[2] observed that people trust *anganwadi* worker as a government representative and complied with MDA. Hence, staff of health centres and *anganwadi* workers were clubbed together as one group. Rates were calculated separately for the staff of health centre/*anganwadi* and volunteers. Chi-square test and Fisher's exact tests of significance were utilized. Odds ratio (OR) and the 95% confidence intervals (95% CI) were also calculated.

Of the 1282 individuals surveyed, 661 (51.6%) were females and 936 (73%) were literates. As per the guidelines, 1231 (96%) were eligible to receive DEC. This survey revealed that 938 (76.2%) of the 1231 eligible persons received DEC during the MDA (coverage rate) and 88.7% of them consumed it (compliance rate). The 'Effective coverage rate' which is a

product of coverage rate and compliance rate, was 67.6% (95% CI: 65–70.2). Sixty-seven houses with 221 persons were missed by the drug distributors in the MDA programme and 13 members could not recall the details about the drug distributors. Excluding these persons, finally data pertaining to 997 subjects (958 eligible persons + 39 non-eligible persons) were analyzed. Majority (78.3%) of the 958 eligible persons received DEC from staff of health centre/ *anganwadi*, while the rest 21.7% received it from other volunteers.

Both the groups of drug distributors made errors in assessing for eligibility to receive DEC, where some eligible subjects were misclassified as non-eligible and *vice-versa*. Misclassification error did not vary significantly between the drug distributors (p >0.05, Table 1). Of the eligible subjects who received DEC, 751 (86.7%) received the recommended dose of DEC. Age based sub-analysis found that under-dosing to children were nine times (OR= 9, 95% CI: 2.5–32.8, p <0.001) more by volunteers when compared with staff of health centre/*anganwadi* whereas in adults, dosing was similar by both the drug distributors. Compliance to MDA was 5.6 times (OR = 5.6; 95% CI: 3.4–9.1) better when distributed by staff of health centre/*anganwadi* as compared to volunteers. Supervised DEC consumption was better (OR=3; 95% CI: 1.2–7.2) with volunteers (Table 1).

In this study the coverage, compliance and effective coverage rates were 76.2, 88.7 and 67.6% respectively. A similar coverage and compliance rates were observed in Karnataka[7]. In Orissa and Madhya Pradesh consumption rates were lower[8,9]. In Karnataka, 16.4% of the persons who failed to consume the distributed drugs were children as their parents feared to give the drugs to their children[10]. Misclassification and distribution of incorrect dosage of DEC especially to children would affect the compliance and reputation of the programme. Hence, it warrants re-training for the drug distributors with special emphasis on volunteers and the dosage schedule for children, even though it was the fourth round of MDA. Poor compliance among persons who received DEC from volunteers, is of concern as good

Table 1. Comparison of adherence to guidelines and compliance during mass drug administration between the staff of health centre/*anganwadi* and volunteers

Characteristics	Total no. of persons	No. of Health centres/ *Anganwadis* (%)	No. of volunteers (%)	p-value
*Distribution of DEC to the persons based on the eligibility criteria for MDA, n= 997**				
Eligible persons given DEC	925	726 (93)	199 (92.1)	0.255
Eligible persons not given DEC	33	27 (3.5)	6 (2.7)	
Non-eligible persons not given DEC	36	27 (3.5)	9 (4.2)	
Non-eligible persons given DEC	3	1 (0.1)	2 (0.9)	
*Dose of DEC received by the eligible persons, n = (925–59) = 866***				
Recommended dose	751	604 (87.4)	147 (84)	0.063
Higher dose	59	49 (7.1)	10 (5.7)	
Lower dose	56	38 (5.5)	18 (10.3)	
Compliance of eligible persons who received the recommended dose, n=751				
Consumed DEC	671	565 (93.5)	106 (72.1)	<0.001
Not consumed DEC	80	39 (6.5)	41 (27.9)	
Supervised consumption among the eligible persons who consumed the recommended dose of DEC, n=671				
Supervised	23	15 (2.7)	8 (7.5)	0.019
Non-supervised	648	550 (97.3)	98 (92.5)	

*Excludes individuals in missed house (221) and who did not know the details of the DD (13); **Excludes persons who could not recall the number of tablets received (59), 925–59 = 866.

compliance is crucial to consolidate the gains of the earlier round of MDA to eliminate filariasis[8,11]. In Tamil Nadu, it was found that lack of confidence on the drug distributor is one of the reasons limiting compliance[11]. Poor compliance among persons who received DEC from volunteers may be due to the volunteer's poor communication skills. People may also doubt the volunteer's ability to assess the eligibility for DEC and to dispense correct dose of DEC. This is particularly true as it was found that motivation of drug distributors was one of the common reason for better compliance. However, in places where youth clubs and women groups were actively involved, distribution and consumption rates were higher[12]. These findings highlight the need for appreciable enhancing the people's confidence on volunteers by: (i) incorporating the message 'volunteers are adequately trained and closely supervised by the health centre staff'; (ii) better supervision of volunteers; and (iii) re-training. Despite certain drawbacks in involving volunteers, they were successful in motivating supervised consumption of DEC.

The findings of the present study should be seen in the light of the limitation that the sample was from a limited geographical area and the FPA were not interviewed. Without the involvement of volunteers MDA programme may suffer hence, measures tailored to the local environment guided by operational research is needed.

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