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Letter to the Editor

Residual microfilaraemia in rural pockets of south India after five rounds of DEC plus albendazole administration as part of the LF elimination campaign

Dear Editor,

Lymphatic filariasis (LF) has become a major public health and socioeconomic problem in different parts of the globe. About 63% of the world's population with LF resides in Southeast Asia Region[1] and approximately 1/3rd of the affected people live in India. It is estimated that 554.2 million people in India are at risk of LF infection in 243 districts across 20 states and union territories. Global programme to eliminate lymphatic filariasis (GPELF) was launched in 2000 by the World Health Organization (WHO) with the goal to eliminate LF by 2020. India is committed to eliminate LF by 2015 by annual mass drug administration (MDA) with single dose of diethylcarbamazine (DEC) in combination with albendazole (ALB), for at least five years, along with home-based management of lymphoedema[2]. The current benchmark for success as defined by WHO is <1% microfilaria prevalence in a community with five continued rounds of MDA with at least 60–70% drug compliance[3].

In the present study, Tirukoilur block (11° 57' 58"N/ 79° 12' 9"E), Tamil Nadu, India with a human population of about 1,47,000, covering three Primary Health Centres (PHCs), *viz*. Ariyur, Edaiyur and T. Kunnathur, was surveyed for its LF status. The study was carried out during March 2009 in 32,056 households of 100 villages (urban and rural), as described earlier[4]. A total of five rounds of MDA (2001, 2002, 2003, 2004 and 2007) using DEC+ALB was carried out in this area by the Tamil Nadu Public Health Department. The drug compliance during the fifth MDA (in 2007) was 86.32%. Parasitological survey was carried out in 10% of the population to determine microfilaraemia prevalence (MFP) and indoor resting *Cx. quinquefasciatus* adult female mosquitoes were collected as described by Sunish *et al*[4]. The Institutional Ethical Committee approved the study design as per the national guidelines. The Epi-Info version 3.5.3 and SPSS for windows (version 16.0) was used for data analysis.

Microfilaria (mf) positive individuals were found in 43 of 100 villages of the Tirukoilur block. Of these, 33 villages had >1% MFP. A total of 15,953 individuals were screened in the three PHCs, and the overall MFP was 1.21%, while the geometric mean intensity (GMI) was 0.0216. There was no significant difference (p>0.05) in the GMI of mf among the three PHCs. Higher prevalence and mean intensity of mf was observed in males than females. Similar observation was reported by other researchers[5]. Prevalence increased with age, with a peak value of 2.05% in the age group of >60 yr (Table 1). In the 2–10 yr-old children, 44 mf carriers (0.67%) among 2397 subjects were identified, and there were no gender specific differences (p>0.05). A total of 4607 mosquitoes were collected by spending 432 man hours. Per man hour density was 6.85, 8.69 and 19.05 in Ariyur, Edaiyur and T. Kunnathur PHCs, respectively. There was no significant difference for infection and infectivity rates among the three PHCs (p>0.05). The transmission intensity index was 0.0278 in Ariyur, 0.0614 in Edaiyur and 0.0442 in T. Kunnathur.

The Government of India has accorded a high priority for LF elimination through MDA programme. As per WHO guidelines, any area (usually an administrative unit) in an endemic country with mf prevalence of >1% is to be covered under the MDA programme[6]. The administrative units in India are "districts", and the overall prevalence of mf was <1% in the Villupuram district (study area is located in this district). Five rounds of MDA brought the mf prevalence to <1% in one of the three PHCs alone. Of the 100 villages surveyed, the mf prevalence was nil in 57 villages. There was 72.5% reduction in mf prevalence with a drug compliance of 86.32% in the 5th MDA (2007). After five MDAs, transmission was found to persist in few villages of this block, as indicated by the parasitological and entomological indices. Poor education level, population migration, lack of LF knowledge, high vector abundance and improper waste management were considered as added potential issues for ongoing transmission. Missed round of MDA was another factor[7]. In the study area, drug compliance was effectively achieved (>85%) with appropriate village level IEC (Information Education and Communication)[8]. Three more rounds of MDA along with integrated vector control reduced MFP further to 0.60% (4.40% in 2000 to 0.60% in 2013; 86% reduction) in a sample of villages surveyed (unpublished). However, similar endemic pockets need to be identified in order to implement supple-

Table 1. Gender and age wise microfilaraemia status in three Primary Health Centres (PHCs) of Tirukoilur block, Villupuram district

Gender/ Age	Ariyur PHC			Edaiyur PHC			T. Kunnathur PHC			Total		
	No. screened	MFP (95% CI)	GMI (mf)	No. screened	MFP (95% CI)	GMI (mf)	No. screened	MFP (95% CI)	GMI (mf)	No. screened	MFP (95% CI)	GMI (mf)
Gender												
Male	3429	1.46[a] (1.06–1.86)	0.0276[a] (0.0190–0.0362)	2363	1.95[a] (1.39–2.51)	0.0309[a] (0.0206–0.0412)	1828	1.37[a] (0.84–1.90)	0.0289[a] (0.0162–0.0418)	7620	1.59[a] (1.31–1.87)	0.0289[a] (0.0236–0.0354)
Female	3955	0.56[b] (0.33–0.79)	0.0110[b] (0.0058–0.0162)	2541	1.02[b] (0.63–1.41)	0.0163[b] (0.0094–0.0232)	1837	1.31[a] (0.79–1.83)	0.0212[a] (0.0119–0.0307)	8333	0.86[b] (0.66–1.06)	0.0149[b] (0.0114–0.0195)
Age (yr)												
2–10	1030	0.49 (0.21–1.13)	0.0120 (0.0053–0.0276)	761	0.53 (0.20–1.34)	0.0082 (0.0026–0.0255)	606	0.50 (0.17–1.45)	0.0056 (0.0013–0.0247)	2397	0.50 (0.29–0.87)	0.0092 (0.0049–0.0172)
11–20	1920	0.52 (0.28–0.96)	0.0126 (0.0069–0.0230)	1226	1.22 (0.74–2.01)	0.0145 (0.0073–0.0292)	953	0.84 (0.43–1.65)	0.0124 (0.0053–0.0289)	4099	0.81 (0.57–1.13)	0.0131 (0.088–0.0198)
21–30	1374	0.66 (0.34–1.24)	0.0124 (0.0061–0.0253)	952	1.89 (1.20–2.97)	0.0329 (0.0193–0.0562)	688	1.74 (1.01–3.02)	0.0303 (0.0159–0.0582)	3014	1.29 (0.95–1.76)	0.0229 (0.0160–0.0329)
31–40	1197	1.17 (0.70–1.95)	0.0220 (0.0123–0.0392)	686	1.75 (1.01–3.03)	0.0250 (0.0123–0.0511)	538	2.23 (1.28–3.86)	0.0485 (0.0270–0.0874)	2421	1.57 (1.15–2.15)	0.0281 (0.0200–0.0412)
41–50	861	2.09 (1.33–3.28)	0.0322 (0.0183–0.0568)	537	1.30 (0.63–2.67)	0.0258 (0.0117–0.0569)	382	1.31 (0.56–3.03)	0.0215 (0.0079–0.0590)	1780	1.69 (1.18–2.40)	0.028 (0.0183–0.0428)
51–60	562	1.07 (0.49–2.31)	0.0217 (0.0094–0.0502)	393	2.54 (1.39–4.62)	0.0446 (0.0219–0.0910)	261	1.53 (0.60–3.87)	0.0428 (0.0178–0.1035)	1216	1.64 (1.07–2.53)	0.0336 (0.0210–0.0537)
>60	440	2.27 (1.24–4.13)	0.0410 (0.0204–0.0828)	349	1.72 (0.79–3.70)	0.0299 (0.0121–0.0739)	237	2.11 (0.90–4.84)	0.0448 (0.0182–0.1107)	1026	2.05 (1.34–3.11)	0.0381 (0.0234–0.0617)
Total	7384	0.98 (0.76–1.20)	0.0186 (0.0138–0.0235)	4904	1.47 (1.13–1.81)	0.0233 (0.0172–0.0294)	3665	1.34 (0.97–1.71)	0.0251 (0.0172–0.0330)	15953	1.21 (1.04–1.38)	0.0216 (0.0183–0.0254)

[a,b]Chi-square test values followed by same alphabet across column do not differ significantly from each other; MFP—Microfilaria prevalence; GMI (mf)—Geometric mean intensity of mf.

mentary intervention strategies which are cost-effective and acceptable to the community. Sabesan *et al*[9] had suggested that the intervention unit could be at the level of PHC, as the infection foci are usually clustered at village level within a PHC. Additionally, all healthcare delivery of the public-health system is tailored through the PHC. Integrated vector control is an effective control option in these endemic pockets, to help sustain the benefits of MDAs and thus reduce mf prevalence further[5]. Integration of government health services along with the community will ensure LF elimination.

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