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Large-scale entomological assessment of *Wuchereria bancrofti* transmission by dissection and PCR-ELISA in Gampaha district, Sri Lanka

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Entomological surveys are important tools for monitoring progress of lymphatic filariasis (Lf) eradication programs. In this study, dissection of *Culex quinquefasciatus* was compared with a Polymerase Chain Reaction – Enzyme Linked Immunosorbent Assay (PCR-ELISA) for pooled mosquitoes to assess filarial infection levels in the major vector of *Wuchereria bancrofti* in Gampaha district, following mass-treatment programme with diethylcarbamazine (DEC) and albendazole. Mosquitoes were collected in 30 sentinel and 15 non-sentinel sites in 15 Medical Officer of Health (MOH) areas of Gampaha district known for the presence of *W. bancrofti* transmission. Captured mosquitoes were dissected to determine the *W. bancrofti* larvae (L1, L2, L3). PCR was carried out using Deoxyribonucleic acid (DNA) extracted from mosquito pools (15 body parts/pool) utilizing primers specific for the Wb-*Ssp*I repeat. PCR products were analyzed by hybridization ELISA using fluorescein-labeled wild type specific probes. The prevalence of infected/infective mosquitoes in PCR pools (3pools/site) was estimated using the PoolScreen^{TM} algorithm and a novel probability-based method. The prevalence of infected mosquitoes with L1-L2 larvae of *W. bancrofti* ranged from 0%–8.54% by dissection and point estimates of infection prevalence as assayed by PCR-ELISA, ranged from 0% – 25.4%. Mosquitoes collected from all MOH areas (80%, N = 12), except for Minuwangoda, Dompe and Ragama, were positive for *W. bancrofti* larvae, with a prevalence rate ranging from 0.78% to 16.97% in both methods. Of 30 sentinel sites, 43.3% (N = 13) were positive for *W. bancrofti* transmission whereas it was evident in 40% (N = 6) of non-sentinel sites. The proportion of positive pools detected by the PCR-ELISA assay was higher than that obtained by the dissection indicating that PCR-ELISA assay is more sensitive than the dissection method in detecting infected/infective mosquitoes. Also results of this study showed that autochthonous transmission of *W. bancrofti* continues in the Gampaha district despite completion of the 5 year mass drug administration (MDA) programme. Therefore, we emphasize the use of more sensitive tools such as PCR-ELISA to monitor the impact of the MDA programme on disease transmission. This study also emphasizes that control measures should be further continued until the microfilareamic population is reduced to a level which could interrupt transmission in the area.

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