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Imported bancroftian filariasis: Diethylcarbamazine response and benzimidazole susceptibility of Wuchereria bancrofti in dynamic cross-border migrant population targeted by the National Program to Eliminate Lymphatic Filariasis in South Thailand

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Abstract
The implementation on the Thailand-Myanmar border of annual mass drug administration (MDA) of a single 6 mg/kg dose of diethylcarbamazine (DEC) plus 400 mg albendazole, part of the National Program to Eliminate Lymphatic Filariasis (PELF), has been challenging. In particular, chain migration of cross-border Myanmar workers at risk for nocturnally periodic Wuchereria bancrofti infection can lead to imported bancroftian filariasis (IBF) in Thailand. IBF is targeted for multiple-dose MDA with 300 mg DEC, in addition to what is recommended by the World Health Organization (WHO). The dynamic Myanmar migrants in Phang-nga, southern Thailand were sampled to test whether the responsible W. bancrofti has a genetic predisposition of benzimidazole exposure, and IBF exhibits DEC susceptibility. The long-term migrants had more access to DEC. IBF in W. bancrofti antigenemic (microfilaremic vs. amicrofilaremic) short-term migrants exhibited susceptibility to a 300-mg single-dose DEC treatment. During the course of a 3-month follow-up, antigenemia was significantly reduced, but microfilaremia was fluctuated. Surprisingly, a newly recognized Mansonella infection co-existing among W. bancrofti-affected Myanmar migrants elicited microfilaremia clearance within a month after treatment. As a result of the presence of genetically stable W. bancrofti β-tubulin (Wbtubb) gene responsible for benzimidazole susceptibility, IBF did not possess a genetic predisposition for benzimidazole exposure. Point mutations at positions Phe167Tyr and Phe200Tyr were not detected by Wbtubb locus-specific nested PCR and sequencing. This study has the potential to help guide not only the Thai/Myanmar PELF surveillance and monitoring of mass treatment impacts on W. bancrofti, but also the other endemic countries allied with the Global Program to Eliminate Lymphatic Filariasis (GPELF).

Author Keywords
Benzimidazole susceptibility; Diethylcarbamazine; Imported bancroftian filariasis; National Program to Eliminate Lymphatic Filariasis; Wuchereria bancrofti

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