REVIEW

DNA-BASED DIAGNOSIS OF LYMPHATIC FILARIASIS

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Abstract. Lymphatic filariasis (LF) is still a major public health problem. The disease is ranked by the World Health Organization (WHO) as the second leading cause of permanent and long-term disability, and has been targeted for elimination by 2020. Effective diagnosis LF is required for treatment of infected individuals, for epidemiological assessment and for monitoring of the control program. Conventional diagnosis of LF depends on detection of microfilariae (Mf) in blood specimens, which has low sensitivity and specificity. Detection of specific circulating filarial antigens is regarded by WHO as the 'gold standard' for diagnosis of LF. However, the limitations of the antigen tests are cost and inconsistent availability. Although anti-filarial IgG4 antibody levels are associated with active LF infections, however, cross-reactivity with other filarial parasites is common. Not as sensitive as antigen tests, DNA-based techniques have been developed to diagnose and differentiate filarial parasites in humans, animal reservoir hosts, and mosquito vectors. These include DNA hybridization, polymerase chain reaction (PCR) amplification using specific primers (*eg Ssp* I repeat, pWb12 repeat, pWb-35 repeat, and LDR repeat for *Wuchereria bancrofti* and *Hha* I repeat, glutathione peroxidase gene, mitochondrial DNA for *Brugia malayi*), and universal primers, multiplex-PCR, PCR-restriction fragment length polymorphism (PCR-RFLP), PCR-enzyme linked immunosorbent assay (PCR-ELISA), as well as quantitative PCR. Furthermore, because bancroftian filariasis is endemic on the Thai-Myanmar border, the potential now exists for a re-emergence of bancroftian filariasis in Thailand, and random amplified polymorphic DNA (RAPD) analysis has proved effective to differentiate Thai and Myanmar strains of *W. bancrofti*.

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