Detection of malaria in Malaysia by nested polymerase chain reaction amplification of dried blood spots on filter papers

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Abstract

A modified nested polymerase chain reaction (PCR) method for detection of *Plasmodium falciparum*, *P. vivax* and *P. malariae* was combined with a simple blood collection and deoxyribonucleic acid (DNA) extraction method and evaluated in Malaysia. Finger-prick blood samples from 46 hospital patients and 120 individuals living in malaria endemic areas were spotted on filter papers and dried. The simple Chelex® method was used to prepare DNA templates for the nested PCR assay. Higher malaria prevalence rates for both clinical (78·2%) and field samples (30·8%) were obtained with the nested PCR method than by microscopy (76·1% and 27·5%, respectively). Nested PCR was more sensitive than microscopy in detecting mixed *P. falciparum* and *P. vivax* infections, detected 5 more malaria samples than microscopy on the first round of microscopical examination, and detected malaria in 3 microscopically negative samples. Nested PCR failed to detect parasite DNA in 2 microscopically positive samples, an overall sensitivity of 97·4% compared to microscopy. The nested PCR method, when coupled with simple dried blood spot sampling, is a useful tool for collecting accurate malaria epidemiological data, particularly in remote regions of the world.

Keywords: malaria; *Plasmodium falciparum*; *Plasmodium vivax*; diagnosis; polymerase chain reaction

Published in Transactions of the Royal Society of Tropical Medicine and Hygiene
Volume 90, Issue 5, September-October 1996, Pages 519-521