Estimation of the prevalence of lymphatic filariasis by a pool screen PCR assay using blood spots collected on filter paper

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Summary

The prevalence of lymphatic filariasis was estimated by PCR-based pool screening of night blood collected from 865 individuals living in ten areas endemic for Wuchereria bancrofti, Brugia malayi or B. timori in Indonesia. A total of 232 microfilaraemics were identified by filtration of 1 ml of blood. The microfilaria (mf) prevalence ranged from 6% to 54%, and the mf density in microfilaraemics ranged from 1 mf/ml to 6028 mf/ml. PCR assays both for W. bancrofti or Brugia spp. detected a single mf present on a 30 µl dried filter paper blood spot. One hundred and seventy-eight pools of five blood spots in each pool (pool-5) were tested by PCR and 101 (57%) pools were positive. When pool size was increased to 10 spots per pool (pool-10), 65 (70%) of 93 pools were positive. Pearson’s correlation and linear regression showed a strong correlation between filtration and pool screen PCR results for pool-10 (r = 0.835) and pool-5 (r = 0.695). Based on the determination coefficient (R), the results of pool-10 PCR (R = 0.697) gave a better prediction compared with pool-5 PCR (R = 0.483). This study suggests that pool screen PCR may be a useful tool for monitoring the Global Program to Eliminate Lymphatic Filariasis.

Keywords: Lymphatic filariasis; Blood filtration; Pool screen; Blood spots; PCR; Indonesia

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