

ABSTRACT

Schistosoma mansoni (*S. mansoni*), soil-transmitted helminths (STH) and protozoa affect approximately 2 billion people world-wide. Most of these infections occur in developing countries and children below 14 years of age are the most affected. Mbita in western Kenya is one of the regions in which these infections are widely spread. Kato-Katz and formalin-ether concentration (FEC) techniques are widely used for the diagnosis of *S. mansoni*, STH, and intestinal protozoa infections respectively, but these methods are labour intensive and have low sensitivity especially for low-intensity infections. Moreover, Kato-Katz does not allow for detection of intestinal protozoa while FEC is a qualitative technique. The newly developed Mini-FLOTAC technique has been shown to be more sensitive, hence the need to validate it in a population with low infection intensities especially in children below six years (nursery school children). Therefore as part of a search for a gold standard for diagnosis of intestinal helminths and protozoa, this study sought to compare the diagnostic performance of Mini-FLOTAC with FEC and Kato-Katz for the detection of *S. mansoni*, STH, and intestinal protozoa in nursery school children in Mbita western Kenya. The specific objectives were to compare the sensitivity and specificity of Mini-FLOTAC with FEC and Kato-Katz technique and also to determine the degree of agreement among the techniques in the detection and determination of prevalence of *S. mansoni*, STH and intestinal protozoa in nursery school in Mbita, western Kenya. Stool samples were collected from 435 children in 22 schools who were randomly sampled using Lot quality Assurance method. Stool samples were analyzed for intestinal parasites using Mini-FLOTAC, FEC, and Kato-Katz techniques. Using Kato-Katz as the reference standard for helminthes and FEC for protozoa, Mini-FLOTAC demonstrated a sensitivity of 78.4% to 100% and a specificity of 95.3% to 100% for the detection of helminthes, and a sensitivity of 68.7% and a specificity of 75.8% for the detection of protozoa. Therefore, Mini-FLOTAC is sensitive and specific for the qualitative diagnosis of *S. mansoni* and STH; but its sensitivity is low for protozoa. Moreover, there was significant moderate agreement $\kappa = 0.410$ (95% CI, 0.41 to 0.60), $p < 0.05$ between Mini-FLOTAC and Kato-Katz for detection of *S. mansoni*, a slight agreement for hookworm $\kappa = 0.121$ and *Ascaris lumbricoides* $\kappa = 0.063$ (95% CI, 0.01 to 0.20), $p < 0.05$. However, there was fair agreement $\kappa = 0.373$ (95% CI, 0.21 to 0.40), $p < 0.05$ between Mini-FLOTAC and FEC for the detection of protozoa. Hence, Mini-FLOTAC can be used as an alternative to Kato-Katz in *S. mansoni* and STH diagnosis. The sensitivity and specificity of Mini-FLOTAC can be improved by inclusion of a staining step e.g. with iodine to enhance visibility of the cysts and eggs for the diagnosis of intestinal protozoa and helminths.