ABSTRACT

Schistosomiasis infects approximately 207 million people worldwide with 90% of the cases occurring in Africa. Kato-Katz, is the standard method of *S.mansoni* diagnosis, however it is characterized by low sensitivity. Another method of diagnosis is the antibody ELISA, which is highly sensitive but lacks specificity. The PCR test is 98% sensitive and 100% specific but it is costly for use in limited resource settings. The high sensitivity and specificity of the PCR makes it a useful gold standard for evaluation of new diagnostic tests. Children below 14 years are mostly affected by schistosomiasis and Asembo region in western Kenya is where most of these infections are found. This study which was cross-sectional in nature aimed to compare the sensitivities and the specificities of POC/CCA, ELISA, and Kato-Katz against PCR in the detection of *S.mansoni* in school children in Asembo, Rarieda district. It further looked at factors that may affect the performance of the POC/CCA, ELISA and Kato-Katz tests. A sample of school children (n=950) provided stool, urine, and blood samples. Stool samples were used for Kato-Katz and PCR testing, urine samples for POC/CCA testing and finally the blood samples for antibody ELISA. The sensitivity of a test was defined as the proportion of the participants with the disease who had a positive PCR result. Similarly, specificity was defined as the proportion of the participants without the disease who had a negative PCR result. McNemar's test was used to determine whether there were row and column marginal frequencies between the PCR positive and negative groups in respect to soil-transmitted helminths (STHs), hematuria, pyuria and malaria. Results showed that POC/CCA had a sensitivity of 78.30% while Kato-Katz and ELISA had sensitivities of 70.44% and 50.16%, respectively. Kato-Katz had a specificity of 92.70% while POC/CCA and ELISA had specificities of 61.20% and 85.11%, respectively. In order to assess if infection with STHs (*Trichuris trichiura*, *Ascaris lumbricoides*, and hookworm) had any effect on the performance of the POC/CCA tests, responses were compared between individuals who were PCR positive and infected with the helminths and those who were PCR positive but not infected with the helminthes, respectively. The results showed no significant differences in percentages of positive POC/CCA with *Trichuris trichiura* at 76.3% vs. 78.6 % (*P*=0.8338), POC/CCA positive with hookworm at 81.8% vs. 78.2% (*P*=1.000) and POC/CCA with *Ascaris lumbricoides* at 66.7% vs. 78.9 % (*P*=0.3315). These results showed that STHs infections did not affect the performance of POC/CCA tests. Similar comparisons were also made to determine the effect of hematuria, pyuria and malaria on POC/CCA performance. The results showed no significant difference in percentages of positive POC/CCA with hematuria cases at 100% vs. 88.8 % (*P*=1.0000), POC/CCA with pyuria at 100% vs. 88.3 % (*P*=1.0000) and POC/CCA with malaria at 72.7% vs. 83.4 % (*P*=0.0862). Findings presented here showed that POC/CCA was the most sensitive test when screening for *S.mansoni* in high prevalence areas. Co-infections did not affect the sensitivities of the tests. However, there is need to further improve on the specificity of the POC-CCA.