Evaluation of Fluorescent In-Situ Hybridization Technique for Diagnosis of Malaria in Ahero Sub-County Hospital, Kenya

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Abstract

Background:
Malaria is a major cause of morbidity and mortality. Treatment of malaria in a timely manner could avert deaths. Treatment ultimately relies on the rapid and accurate diagnosis. Fluorescence in situ hybridization
(FISH), a cytogenetic technique based on detection of specific nucleic acid, has the potential to address the limitations of the current diagnostic approaches. This study investigates further the performance of FISH for the diagnosis of malaria in a rural setting in Western Kenya.
Methods:
Blood samples from 302 patients presenting with fever (temperature≥
37.5 °C) were examined for malaria using the Giemsa microscopy (GM), rapid diagnostic test (RDT), polymerase chain reaction (PCR) and FISH.
Results:
The sensitivity and specificity of FISH was 85.6% and 96.2% respectively, while the corresponding values for GM were 82.2% and 100% respectively. RDT and PCR had sensitivities of 91.1% and 98.9%, respectively with their specificities being 89.6 and 100%, respectively. The positive predictive values for RDT, GM, FISH and PCR were 78.8%, 100%, 90.6% and 100%, respectively. The negative predictive values for RDT, GM, FISH and PCR were 96.0%, 93.0%, 94.0% and 99.5%, respectively. Their respective diagnostic accuracies were 90.1%, 94.7% 93.0% and 99.7%.
Conclusion:
The present study demonstrates that the specificity and reproducibility of FISH assays are high, thus adding to the growing evidence on the potential of the technique as an effective tool for the detection of malaria parasites in remote settings.
Keywords:
Malaria, Fluorescent in-situ hybridization, Microscopy, Rapid diagnostic tests, Sensitivity, Specificity

Kandie et al. BMC Infectious Diseases Vol.18 (22) pp.2-7 (2018)
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