

Valeur diagnostique du test de diagnostic rapide dans la lutte contre le paludisme en République démocratique du Congo

Accuracy of Rapid Diagnostic Test to control malaria infection in the Democratic Republic of Congo

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Summary

Background. Malaria remains a public health problem in many developing countries. An estimated 440,000 deaths occur annually mostly among children under five years of age worldwide. The DRC and Nigeria account collectively for over 40% for the estimated total of these malaria deaths. Malaria can be diagnosed by microscopy, rapid diagnostic tests (RDT), or polymerase chain reaction (PCR). Here, we compare the sensitivity and specificity of these three diagnostic methods.

Methods. We analyzed 7,250 Dried Blood Spots (DBS) from children under 5 years of age collected during the 2013-2014 DRC Demographic and Health Survey, a nation-wide population-representative survey. These samples were analyzed by the SD BIOLINE rapid test targeting the *Plasmodium falciparum* Histidine-Rich Protein 2, by light microscopy and by PCR. The sensitivities and specificities of microscopy, RDT and PCR were determined using Latent Class Analysis (LCA) which constructs an “alloyed” reference standard.

Results. After sample weighting, the overall prevalence of *falciparum malaria* was 34.1% by PCR, 30.9% by RDT and 22.7% by microscopy. By LCA, we found that PCR was the most sensitive [94.6%, 95% CI (93.3-95.8)] compared to RDT [86.9%, 95% CI (85.2 – 88.6)] and microscopy [76.7, 95% CI (74.6 – 78.8)]. In contrast, microscopy was the most specific, [97.2%, 95% CI (96.6 – 97.8)] versus PCR and RDT [88.3, 95% CI (87.2 – 89.4)] and [88.1%, 95% CI (87.1 – 89.2)] respectively. 517 (7.2%) samples were only positive by RDT, probably due to persistent of HRP-2 antigenemia. However, RDT missed 901 (12.7%) PCR- and /or microscopy-positive infections.

Conclusion. HRP-2 based RDTs are still useful tools for malaria surveillance. However, using LCA, the sensitivity and specificity are only 87% and 88%, respectively. This should be considered during any discussion on strategies regarding the control of malaria mostly in remote area where microscopy is not available.

Key words: accuracy, falciparum, rapid diagnostic test, malaria, microscopy, DR Congo