Kwenti Emmanuel Tebit, J Clin Exp Pathol 2017, 7:1 (Suppl)
http://dx.doi.org/10.4172/2161-0681.C1.032

Comparative evaluation of a rapid diagnostic test, an antibody ELISA and a pLDH ELISA in detecting asymptomatic malaria parasitemia in blood donors in an area of high transmission

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Background & Objectives: The objectives are to determine the prevalence of malaria parasitemia in blood donors in Buea; and to evaluate the performance of an RDT, a malaria antibody ELISA and a pLDH ELISA in the detection of asymptomatic malaria parasitemia in the target population.

Methods: In a prospective study performed between September 2015 and June 2016, 1240 potential blood donors were enrolled. The donors were screened for malaria parasites by Giemsa microscopy (GM) and RDT. A sub sample of 184 comprising 88 positive and 96 negative samples were selected for the evaluation of the pLDH ELISA and the antibody ELISA. The Chi-square test, correlation analysis were all performed as part of the statistical analyses. The cutoff of statistical significance was set at $p<0.05$.

Results: The prevalence of malaria parasitemia in this study was 8.1% (95% CI: 6.6-9.7). The prevalence was not observed to be dependent on the age or the sex of the participants. The RDT demonstrated that sensitivity (88.0%), specificity (99.1%) and negative predictive value (99.0%) was higher than the ELISAs. The performance of the pLDH ELISA which demonstrated the highest positive predictive value (91.6%) was generally comparable to the RDT. The sensitivity was lowest with the antibody ELISA (69.9%), which also demonstrated the highest false positive and false negative rates. The detection threshold for the pLDH (3 parasites/µl) was lower compared to the RDT (50-60 parasites/µl). Non-significant positive correlations were observed between the parasite density and the pLDH titres or the malaria antibody titres.

Conclusions: Overall, the RDT and the pLDH ELISA demonstrated a perfectly correlated agreement with GM meanwhile that of the antibody ELISA was substantial. The pLDH is therefore recommended for mass screening of blood for transfusion in the study area. But where not feasible, an RDT will suffice.

Biography

Kwenti Emmanuel Tebit is a PhD student in the Department of Microbiology and Parasitology at the University of Buea, Cameroon. He is a staff member at the Regional Hospital of Buea Blood Bank. He has published more than 25 papers in reputed journals and has reviewed in over 16 reputed journals worldwide.

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