

## ***Plasmodium falciparum* parasites with histidine-rich protein 2 (*pfhrp2*) and *pfhrp3* gene deletions in frontier endemic regions of Brazilian Amazon**

**Introduction:** Recently, a growing number of studies are reporting deletions of the *pfhrp2* and *pfhrp3* genes in *P. falciparum* populations in various malaria-endemic countries. As the most part of rapid diagnostic tests for malaria (RDTs) use a Histidine-Rich Protein 2 (HRP2) for *P. falciparum* diagnosis, the prevalence of *pfhrp2* and, its homologous, the *pfhrp3* genes deletions must be evaluated. Confirming the presence of parasites with these deletions in endemic areas is crucial, as individuals infected with *P. falciparum* with *pfhrp2/3* gene deletions may present false-negative results in RDTs. The **objective** of this study was to evaluate the deletion of *pfhrp2/3* genes in clinical samples of *P. falciparum* obtained from endemic areas of Brazil, contributing to the genomic surveillance of malaria. **Method:** 342 samples from symptomatic individuals were collected during surveillance in municipalities along the international border between Brazil-Peru (Acre) and between Brazil-Venezuela-Guyana (Roraima). Diagnosis of *P. falciparum* was performed using thick blood smear and confirmed by detection of the 18S rRNA gene by PCR. DNA quality was confirmed by amplification of the *pfmsp2* gene. Detection of the *pfhrp2* and *pfhrp3* genes was performed according to published and well-standardized WHO protocols. **Results:** Of the 342 samples, 86 (25.2%) had a deletion of the *pfhrp2* gene, 168 (49.1%) had a deletion of the *pfhrp3* gene, and 32 (9.4%) had a deletion of both genes. Statistically significant differences in deletion frequencies were found in Acre (higher frequency of *pfhrp3* deletions). **Conclusion:** Results of this study were consistent with studies conducted in Latin America in areas of high prevalence of mutant parasites and highlight the importance of continuously monitoring the presence and spread of parasites with *pfhrp2* deletion to ensure better performance of RDTs and contribute to the genomic surveillance of malaria, and consequently, the elimination of the disease.

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