

Prevalence of pfhrp2/3 deletions in South Sudan: results of a 10-site national survey

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Background

pfhrp2/3 deletions are recognized as a major threat to malaria control, particularly in the Horn of Africa. Data on South Sudan is lacking. Therefore, MSF conducted a cross-sectional survey at 10 geographically distinct sites across South Sudan to estimate the prevalence of *P. falciparum* with pfhrp2/3 gene deletions, and their impact on diagnosis of *P. falciparum* by HRP2 RDT.

Methods

Patients under 15 years with suspected uncomplicated malaria were eligible for enrolment. Using the standard WHO protocol for surveillance of hrp2/3 deletions, 200 suspected cases per site were targeted in order to have at least 80 PfPLDH-positive cases per site. The main objective was to determine whether more than 5% of cases would be missed by HRP2 RDT, which is the cut-off recommended by WHO for considering an alternative RDT. HRP2 and PfPLDH-based RDTs were performed in parallel and dried blood spots prepared. Multiplex quantitative PCR was done to amplify pfhrp2, pfhrp3, pfldh and human tubulin genes.

Results

From January 22 to March 27, 2024, a total of 1842 participants (53% males) were enrolled, with a median age of 3 years (IQR 1-8). Overall HRP2 RDT positivity was 729/1842 valid tests (40%, site-specific range 13-65%). Overall PfPLDH RDT positivity was 584/1839 valid tests (32%, site-specific range 12-56%). A total of 14 of 584 (2.6%) PfPLDH-RDT positive samples were HRP2-RDT negative. Molecular analysis demonstrated pfhrp2/3 double deletion in 2 out of 14 PfPLDH+/HRP2- RDT (0.34% overall, and 1.05%, 1.85% respectively in concerned sites), whereas the other PfPLDH+/HRP2- results had alternative causes.

Conclusion

This survey showed reassuring results, with site-specific prevalence of pfhrp2/3 double deletions leading to missing cases when using HRP2 RDT, remaining well under the WHO recommended cut-off of 5%. These outcomes will inform diagnostic choices for the national malaria control program.

Genetic deletions in *Plasmodium falciparum* pfhrp2/3 genes affect diagnosis by HRP2 malaria RDT. A survey across 10 sites in South Sudan showed reassuring results.