Actualités du Pharo 2021 – Session 7

Plasmodium ovale wallikeri and Plasmodium ovale curtisi: from the development of a differentiation method to the retrospective analysis of cases in the National Malaria Reference Centre, period 2013-2018

Keywords: paludisme, Plasmodium ovale wallikeri, Plasmodium ovale curtisi, qPCR-HRM, test de diagnostic rapide

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Plasmodium ovale spp is one of five species of Plasmodium that can infect humans. One of its notable characteristics is its ability to cause relapses, which are defined as the reappearance of asexual forms of Plasmodium ovale spp in the peripheral blood after appropriate and well-monitored antimalarial treatment, without further contamination. Since 2010, this species has been separated into Plasmodium ovale curtisi and Plasmodium ovale wallikeri on the basis of distinct genetic sequences.
We have developed a qPCR-HRM method to distinguish them. Using this method, we identified 368 isolates of Plasmodium ovale wallikeri and 309 isolates of Plasmodium ovale curtisi received at the CNR du Paludisme between January 2013 and December 2018. Epidemiological, clinical and biological data collected revealed more severe thrombocytopenia (94 G/L [70-130] vs 111 G/L [84-145], p<0.001) and a shorter latency period (34 days [10-95] vs 72 days [18-208], p<0.001) in Plasmodium ovale wallikeri infections. In addition, patients infected with Plasmodium ovale wallikeri were more often treated with artemisinin-based combination therapy (29.2% vs 17.1%, p<0.001). Although not statistically significant, patients infected with Plasmodium ovale wallikeri tended to be hospitalised more frequently in intensive care units/continuing care units (p=0.134) and to have severe thrombocytopenia (p=0.123) than patients infected with Plasmodium ovale curtisi.
Regarding diagnostic methods, immunochromatographic techniques detecting aldolase were more sensitive than those detecting pLDH (47.8% vs 10.6%, p<0.001).
Finally, we analysed the sequences of the potra gene in 90 isolates of Plasmodium ovale spp and found that this gene was not sufficiently polymorphic to be used for the genetic typing of revivals that are clinically and epidemiologically defined.