

Increased risk of severe malaria in travellers during the COVID-19 pandemic

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Highlights

We observed an increase in severe cases of falciparum malaria among French service members (who are travellers in endemic areas) in 2020, associated with an increase in the time between onset of symptoms and diagnosis/treatment. The COVID-19 epidemic may have lengthened the malaria diagnosis process, mainly due to clinical similarities.

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Several experts in infectious disease management have warned that health care programs could be destabilised due to the COVID-19 pandemic. In particular, they expect an increase in the incidence of malaria and severe malaria in endemic countries.^{1,2}

Indeed, we have observed the first signs that could also confirm this prediction in non-endemic countries. We have been performing epidemiological surveillance among the French armed forces (FAF) for years, using a system described elsewhere.³ In 2020, we observed 16 severe falciparum malaria cases (according to WHO criteria), whereas we expected a 5-year mean of 6.6 cases (SD=1.9). They originated in Sub-Saharan Africa, and occurred both during missions in endemic areas, where service members had access to military physicians only (6 cases), and after returning to non-endemic France (10 cases). It was a 167% increase from 2019 to 2020 ($p=0.04$, Fisher test), which could not be attributed to an increase in malaria incidence in the FAF (978 p. 100,000 person-years in 2019 versus 1084 in 2020, $p=0.49$, Fisher test), nor to decreased compliance with chemoprophylaxis (20% in 2019 vs 27% in 2020). Knowing that lengthening the time to treatment can lead to severe malaria, this increase could instead be linked to a delay between the onset of symptoms and diagnosis/treatment (1.4 days on average in 2019 vs 5.5 in 2020, $p=0.02$, Kruskal-Wallis test), which had never been observed before.

Our hypothesis is that the COVID-19 pandemic was responsible for this delay, due to the deterioration in the quality of care it has led to. Patients may not have recognized the signs of malaria (mainly fever), which are similar to those of COVID-19; physicians may not have immediately thought of malaria and requested a SARS-CoV-2 RT-PCR test. Laboratories were overworked and may have taken longer to return results.⁴

We observed the signal in the FAF, probably because FAF deployments and turnover in malaria endemic countries remained unchanged during the COVID-19 outbreak, contrary to the situation among civilians, who cancelled most tourism or business travel in 2020. At any rate, it is a warning signal that should be taken into account. Information for travellers on the clinical

signs of malaria, and physician awareness about similarities between malaria and COVID-19 and the possibility of having both infections, must be reinforced. Indeed, we systematically give a standard letter to each service member returning from malaria endemic areas which includes a reminder about chemoprophylaxis and recommends early consultation in case of fever. We have delivered additional information to all our military physicians and to the medical community at large, as many soldiers consulted civilian instead of military physicians once they returned to France.⁵ For the general population, there is now a window of opportunity to disseminate this information before international travel resumes.

Declarations

Ethical approval and consent to participate

This was not an experimental protocol, but rather the collecting of anonymised epidemiological surveillance data, so no ethical approval from any named institutional and/or licensing/ethics committee was required.

Consent for publication

Not Applicable.

Availability of data and materials

The data sets generated and/or analysed during the current study are not publicly available, but they are available from the corresponding author upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

Data analysis: Nancy Maugey, Albane de Bonet d'Oléon

Writing: Franck de Laval

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