Reviewer's report

Title: Molecular Epidemiology of Drug-Resistant Malaria in Western Kenya Highlands

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Reviewer: Thomas Loescher

Reviewer’s report:

This study investigated the prevalence of some key mutations of Plasmodium falciparum associated with resistance to chloroquine (CQ) and sulfadoxine/pyrimethamine (SP) in western Kenya. A major objective mentioned by the authors was to investigate the contribution of parasite resistance to the malaria epidemics observed during the last two decades in western Kenyan highlands.

The findings show a high percentage of CQ/SP resistance associated mutations in both highland and lowland areas without significant differences between symptomatic and asymptomatic infections.

The results of this cross-sectional study performed in 2005 are of some interest because a relatively large number of samples, i.e., 600, from different settings have been investigated (areas of different altitude, symptomatic/asymptomatic).

However, this study has considerable limitations. One is the lack of data on clinical and parasitological efficacy in symptomatic infections after treatment. Another limitation is the lack of longitudinal data such as mutation prevalence/in vivo resistance data from the areas investigated before 2004 (change to artemether/lumefantrin) and before 1998 (change to SP).

Furthermore, no information is provided on the 2005 availability and actual use of antimalarials such as CQ, SP, or artemether/lumefantrin.

The authors did not convincingly explain the mechanisms by which parasite resistance may contribute to the highland epidemics, and how to assess such mechanisms and potential associations. The conclusion that 'drug resistance is an important contributor to morbidity and mortality in the highlands' seems not really justified by the results provided.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests