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Regarding the call to explore the unexpected low severity of COVID-19 in Sub-Saharan Africa

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To the Editor:

In December of 2019, an outbreak of pneumonia of unknown origin and often fatal outcome emerged among people associated with a market of seafood and live animals in the city of Wuhan, China (1). Days after, health authorities in that country revealed that the epidemic outbreak that had erupted in that area was produced by a new coronavirus, later named SARS CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) (2). On February 11 of 2020, the World Health Organization (WHO) identified the unknown disease with the acronym COVID-19 (Coronavirus Disease of 2019) (3). This viral infection, and its related disease, has rapidly spread through 185 countries in all continents, and is now a major health problem, with 32 110 656 infected individuals and 980 031 deaths worldwide as of September 25, 2020 (4).

During its global expansion (to the west, first; to the south, later), COVID-19 has shown significant differences in its incidence and lethality rates between continents, regions and countries (4). In spite of their poor economies, insufficient health services and high prevalence of comorbidities, the severity of COVID-19 in Sub-Saharan Africa (SSA) has been relatively benign. Several factors, or combinations of them, have been cited to explain that unexpected evolution (5-6).

At the end of 2017, there were an estimated 219 million malaria cases and 435,000 deaths worldwide. From those, 92% occurred in Sub-Saharan countries (7). For decades, chloroquine (CQ) and hydroxychloroquine (HCQ) were used for reducing the incidence and severity of *Plasmodium* infection. Krishan and Kanchan, in a motivating paper published in this journal (8), have suggested that the systematic antimalarial use of CQ and HCQ, may represent an unintentional prophylaxis against SARS CoV-2 infection in SSA, which potentially slows down the spread of the epidemic and attenuates its severity. Nevertheless, an important argument refutes the possible occurrence of an effective CQ/HCQ prophylaxis against SARS CoV-2 infection in SSA countries: in harmony with the increasing use of artemisinin-based combination therapies to counter *Plasmodium* 4-aminoquinoline resistance, CQ/HCQ are no longer the drugs of choice for the prophylaxis and treatment of malaria since the beginning of the current century (9). In addition, some recent trials have demonstrated that the prophylactic use of CQ/HCQ does not confer protection against SARS CoV-2 infection (10).

On the other hand, Krishan and Kanchan mention in their paper that hemoglobin S (HbS) and HbC are found to provide immunity to the African population against infectious diseases such as *Plasmodium falciparum* malaria (8). From these precedents, and in an interesting rational, they call to explore the possibility that these abnormal types of hemoglobins, or others, may be offering certain protection against SARS CoV-2 infection in those populations.

Additional factors, or combination of them, may be at play and merit to be studied in depth to reach a clear comprehension on what has happened in SSA region. As part of these efforts, it should be taken into account that, besides malaria, others infectious diseases are very prevalent in Sub-Saharan countries. In this sense, it is useful to mention the alternate hypothesis

recently published almost in parallel by two research groups, which suggests that the anti-inflammatory component of the immune modulation triggered by helminths may have a mitigating effect on COVID-19 severity in SSA (11-12).

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References

1. Yang J, Zheng Y, Gou X, Pu K, Chen Z, et al. Prevalence of comorbidities in the novel Wuhan coronavirus (COVID-19) infection: a systematic review and meta-analysis. Int J Infect Dis 2020: 94: 91-95. doi. https://doi.org/10.1016/j.ijid.2020.03.017
2. Gorbalenya A, Baker S, Baric R, Groot R, Drosten C, Gulyaeva A, et al. Nat Microbiol 2020;5:536-544. doi: 10.1038/s41564-020-0695-z
3. World Health Organization. Coronavirus press conference, 11 February 2020. Geneva: WHO, 2020. Available in: https://www.who.int/docs/default-source/coronaviruse/transcripts/who-audio-emergencies-coronavirus-full-press-conference-11feb 2020-final.pdf?sfvrsn=e2019136_2
4. World Health Organization. Coronavirus disease 2019 (COVID-19): Weekly Epidemiological Update, 25 September 2020. Geneva: WHO, 2020. http://www.who.int/emergencies/disease/novelcoronavirus-2019/situation-reports.
5. Napoli P, Nioi M. Global spread of Coronavirus Disease 2019 and Malaria: An epidemiological paradox in the early stage of a pandemic. J Clin Med 2020: 9: 1138. doi: 10.3390/jcm9041138
6. Diop BZ, Ngom M, Pougué Biyong C, Pougué Boyong JN. The relatively young and rural population may limit the spread and severity of COVID-19 in Africa: a modelling study. BMJ Glob Health 2020; 5: e002699. doi: 10.1136/bmjgh-2020-002699.
7. World Health Organization. World malaria report, 2018. https://apps.who.int/iris/bitstream/handle/10665/275867/9789241565653-eng.pdf.
8. Krishan K, Kanchan T. Novel Coronavirus (SARS-CoV-2) resistance in African populations: A cause worth exploring. Acta Biomed 2020; 91: e2020023 DOI: 10.23750/abm.v91i3.9872.
9. Eastman R, Fidock D. Artemisinin-based combination therapies: a vital tool in efforts to eliminate malaria. Nat Rev Microbiol 2009; 7: 764-774. https://doi.org/10.1038/nrmicro2239.
10. Cortegiani A, Ingoglia G, Ippolito M, Giarratano A, Einav S. A systematic review on the efficacy and safety of chloroquine/hydroxychloroquine for COVID-19. J Crit Care 2020; 59:176–190. https://doi.org/10.1016/j.jcrc.2020.06.019
11. Hays R, Pierce D, Giacomin P, Loukas A, Bourke P, McDermott R. Helminth coinfection and COVID-19: An alternate hypothesis. PLoS Negl Trop Dis 2020; 14: e0008628. https://doi.org/10.1371/journal.pntd.0008628.
12. Fonte L, Acosta A, Sarmiento ME, Ginori M, García G, Norazmi MN. COVID 19 lethality in Sub-Saharan Africa and helminth immune modulation. Front Immunol 2020; 11: doi: 10.3389/fimmu.2020.574910

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