

PERSPECTIVE

SUSTAINING EFFECTIVE MALARIA CONTROL DURING THE COVID-19 PANDEMIC

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ABSTRACT

The COVID-19 pandemic has spread to many malaria endemic countries in sub Saharan Africa. There is little or no experience on how the impact of policies put in place to curtail further spread of the pandemic will affect the epidemiology of malaria during the malaria season. The objective of this write-up is to put in perspective, the need to ensure effective malaria control in the midst of the COVID-19 crises. Proper integration of the COVID-19 safety and treatment guidelines with malaria control policies and effective diagnosis in malaria endemic countries in sub Saharan Africa are important in mitigating morbidity and mortality rates which may rise if malaria cases are neglected due to the current burden of the COVID-19 pandemic.

BACKGROUND

In 2018, 228 million cases of malaria occurred worldwide, 213 million of these cases (93%) occurred in the African region.¹ Six countries accounted for more than half of all malaria cases; Nigeria (25%), the Democratic Republic of the Congo (12%), Uganda (5%), and Cote d'Ivoire, Mozambique, and Niger 4% each.¹ Effective management of the disease depends on accurate diagnosis followed by prompt and effective treatment. In Nigeria, heavy rains mark the malaria season.² There is a need to plan for the integration of malaria control on the background of concerted efforts to slow down the spread of COVID-19. Improper integration of control measures may result in the loss of recent gains in the control of malaria in malaria endemic countries. Practices that may place malaria infected individuals (especially pregnant women and children) at a high risk of increased morbidity and mortality in the COVID-19 pandemic include stigmatization of COVID-19 infected people, improper allocation of scarce medical resources, improper use and interpretation of antigen-based malaria rapid diagnosis test kits, prioritizing testing for COVID-19 over malaria in febrile individuals, use of routine rather than expert microscopy, and malaria cases presenting with cough.

Stigmatization of COVID-19 infected people:

Data from those infected with COVID-19 shows that fever and cough were the dominant symptoms with a case fatality ranging from 1 to 3%.³ It is yet undetermined if a persistent chronic infection can occur. Majority of those infected with COVID-19

remain asymptomatic and recover. It is prudent to consider that stigmatization of people infected with COVID-19 may result in people with febrile illnesses avoiding hospitals for fear of being seen by others as being infected with COVID-19. In addition, the fear of coming in contact with COVID-19 cases may also lead to the avoidance of hospital care. It is known that the longer the period between the onset of malaria symptoms and the commencement of effective therapy, the higher the chances of mortality from the disease.⁴⁻⁵ Without proper integration of malaria and COVID-19 management with targeted interventions to prevent stigmatization of those diagnosed with COVID-19, mortality from malaria in endemic countries may rise. Therefore, stigmatization of COVID-19 patients should be prevented.

Improper allocation of scarce medical resources:

Globally in 2019 there was an estimated 229 million malaria cases with 409,000 deaths.⁶ The economic burden of malaria in resource- constrained countries is substantial.⁷⁻⁹ With the current intense focus on the COVID-19 pandemic, the probability of an imbalance between supply and demand for medical resources is high.¹⁰⁻¹¹ In addition, shortage of antimalarial drugs during the malaria seasons, especially in resource-constrained countries of sub-Saharan Africa may pose a challenge to the control of malaria. Scarcity may occur due to reduced focus on malaria. Also, fear-driven use of antimalarial drugs in the treatment of COVID-19 symptoms may weaken appropriate management of malaria.¹²⁻¹⁴ Initial treatment of fever related with

COVID-19 during the ongoing pandemic may also result in a rise in malaria morbidity and mortality. There is a need for plans towards tackling these potential challenges early to avoid their impact on malaria control in endemic countries. While the attention of a majority of tertiary healthcare centers is presently focused on COVID-19, malaria care may have to be redirected to the primary and secondary health care centers. At these centers, small teams trained in the rapid recognition of potential cases of COVID-19 will have to be deployed in a properly interpreted malaria and COVID-19 response agenda.

Use of Antigen based Malaria Rapid Diagnosis

Test Kits: The high infectivity of COVID-19 is likely to shift the diagnosis of malaria to the use malaria rapid diagnosis tests (mRDT) in order to avoid having to prepare blood smears for malaria microscopy. It is worth considering that, during the ongoing pandemic, the combination of PfHRP2 and Pf-pLDH (Combo) test kits should be used in order to minimize the shortcomings of PfHRP2 RDTs.¹⁵ Prolonged persistence of pfHRP2 antigen is common in those with successful clearance of the malaria parasite. This can pose a great danger to health workers. A false positive malaria result in a COVID-19 positive individual may result in the relaxation of personal preventive measures and a high risk of transmission of infection to care givers.¹⁶ There may also be a need to consider the use of validated PCR-based methods of diagnosis of malaria which can be integrated with the PCR-based diagnosis of COVID-19.

Prioritizing testing for COVID-19 over malaria testing in febrile individuals: Delayed diagnosis of malaria during the pandemic may result in the development of complicated malaria and a higher probability of mortality.⁵ Capacity for early diagnosis and prompt commencement of effective antimalarial treatment should be strengthened in healthcare centers during malaria seasons. Malaria should be considered in every febrile case of suspected COVID-19 in malaria endemic countries. There should be a high index of suspicion of isolated or concomitant infection with malaria in acute febrile illnesses presenting to hospitals during the pandemic.

Use of routine rather than expert microscopy: Perhaps one of the major challenges that malaria episodes may pose to control measures aimed at slowing down the spread of COVID-19 will be the use of routine (conventional, non-expert) microscopy in the diagnosis of malaria. Expert microscopists are scarce in sub-Saharan Africa.¹⁷ Microscopy in the diagnosis of malaria is time consuming, requires

expertise, and maintenance of equipment.¹⁸ The diagnostic accuracy of microscopy is user-dependent with a wide range of variation. Misdiagnosis of malaria on account of variation in expertise of microscopists will pose a challenge to COVID-19 care givers as false negative or false positive results may lead to the lowering of preventive measures or delay in commencement of antimalarial treatment. It may be beneficial to limit or avoid the use of conventional microscopy in the diagnosis of malaria while the COVID 19-pandemic is ongoing. Malaria diagnosis may have to be restricted to the use of combo malaria RDT and PCR where available.

Malaria cases presenting with cough: Although the most prevalent symptom of malaria is fever, malaria may present with other symptoms that include vomiting, diarrhea, and cough. Altered pulmonary function in malaria is common and includes airway obstruction, impaired ventilation, impaired gas transfer, and increased pulmonary phagocytic activity.¹⁹ Thus, malaria may mimic the clinical presentations of infection with COVID-19.^{14,20} Individuals presenting with clinical and laboratory evidence of malaria should be promptly treated with effective antimalarial therapies and may also have to undergo the recommended days of isolation until tests results for COVID-19 are available.²¹ There may also be a need to discourage home management of malaria during the COVID-19 pandemic. Information on the similarities between malaria and COVID-19 will have to be added to the advocacy and social mobilization on COVID-19 currently in circulation. Individuals with symptoms of malaria should be encouraged to present at hospitals for management and, where necessary, screening for COVID-19. Rational use of antimalarials will have to be sustained to avoid the emergence of antimalarial resistance in the sub-region.

CONCLUSION

As many countries continue to battle the COVID-19 pandemic, the additional challenge of malaria is upon malaria endemic countries of sub-Saharan Africa during malaria seasons. There is a need to set up malaria services that are integrated with control measures against COVID-19. The need for research on COVID-19 and malaria in sub-Saharan Africa during the pandemic cannot be over-emphasized. The malaria season in the COVID-19 pandemic will severely stretch the limited resources of Governments in sub-Saharan Africa. However, with a well planned integration, effective malaria control is possible.

DISCLOSURE

Authors declare no conflict of interest.

REFERENCES

1. World Health O. World malaria report 2019. Geneva: World Health Organization; 2019 2019.
2. **Makinde OS**, Abiodun GJ, Ojo OT. Modelling of malaria incidence in Akure, Nigeria: negative binomial approach. *GeoJournal*. 2020.
3. **Guan WJ**, Zhong NS. Clinical Characteristics of Covid-19 in China. Reply. *N Engl J Med*. 2020; 382(19):1861-1862.
4. Management of severe malaria: a practical handbook/World Health Organization. World Health O, editor. Geneva, Switzerland: World Health Organization; 2012.
5. **Sheehy TW**, Reba RC. Complications of falciparum malaria and their treatment. *Annals of internal medicine*. 1967; 66(4):807-809.
6. World Health O. World malaria report 2020: 20 years of global progress and challenges. Geneva: World Health Organization; 2020 2020.
7. **Hailu A**, Lindtjorn B, Deressa W, *et al.*, Robberstad B. Economic burden of malaria and predictors of cost variability to rural households in south-central Ethiopia. *PLoS One*. 2017;12(10): e0185315.
8. **Breman JG**, Egan A, Keusch GT. The intolerable burden of malaria: a new look at the numbers. *The American Journal of Tropical Medicine and Hygiene Am J Trop Med Hyg*. 2001; 64(1_suppl): iv-iv.
9. **Gallup JL**, Sachs JD. The economic burden of malaria. *The American journal of tropical medicine and hygiene*. 2001; 64(1-2 Suppl):85-96.
10. **Emanuel EJ**, Persad G, Upshur R, *et al.* Fair Allocation of Scarce Medical Resources in the Time of Covid-19. *New England Journal of Medicine*. 2020; 382(21):2049-2055.
11. **Moodley K**, Ravez L, Obasa AE, *et al.* What Could “Fair Allocation” during the Covid-19 Crisis Possibly Mean in Sub-Saharan Africa? *Hastings Center Report*. 2020; 50(3):33-35.
12. **Ajayi IO**, Ajumobi OO, Falade C. Malaria and COVID-19: commonalities, intersections and implications for sustaining malaria control. *The Pan African medical journal*. 2020; 37(Suppl 1):1.
13. **Hussein MIH**, Albashir AAD, Elawad OAMA, Homeida A. Malaria and COVID-19: unmasking their ties. *Malaria Journal*. 2020; 19(1):457.
14. **Chanda-Kapata P**, Kapata N, Zumla A. COVID-19 and malaria: A symptom screening challenge for malaria endemic countries. *Int J Infect Dis*. 2020; 94:151-153.
15. **Heutmekers M**, Gillet P, Cnops L, *et al.* Evaluation of the malaria rapid diagnostic test SDFK90: detection of both PfHRP2 and Pf-pLDH. *Malar J*. 2012; 11:359.
16. **Dalrymple U**, Arambepola R, Gething PW, Cameron E. How long do rapid diagnostic tests remain positive after anti-malarial treatment? *Malar J*. 2018; 17(1):228.
17. **Berzosa P**, de Lucio A, Romay-Barja M, *et al.* Comparison of three diagnostic methods (microscopy, RDT, and PCR) for the detection of malaria parasites in representative samples from Equatorial Guinea. *Malaria Journal*. 2018; 17(1):333.
18. **Hanscheid T**. Diagnosis of malaria: a review of alternatives to conventional microscopy. *Clin Lab Haematol*. 1999; 21(4):235-245.
19. **Anstey NM**, Jacups SP, Cain T, *et al.* Pulmonary manifestations of uncomplicated falciparum and vivax malaria: cough, small airways obstruction, impaired gas transfer, and increased pulmonary phagocytic activity. *J Infect Dis*. 2002; 185(9):1326-1334.
20. **Diongue K**, Diallo MA. COVID-19 during malaria transmission season in Africa and why we should be prepared: An example from Senegal. *African Journal of Laboratory Medicine*; Vol 9, No 1 (2020). 2020.
21. **Kusotera T**, Nhengu TG. Coronavirus-19 and malaria: The great mimics. *Afr J Prim Health Care Fam Med*. 2020; 12(1): e1-e3.