

Hydro-oxy Chloro-Quinine: A Malaria Drug for COVID-19

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Abstract

In this article we have presented a brief history of drug discovery of malaria, a deadly disease. Death rate of malaria was no less than COVID-19. Hydro-oxy chloro quinine an old generation of malarial drug is found to be effective in treatment of uncomplicated COVID-19. In the absence of any correlation of drug actions in these two cases, it is recommended for further studies.

Keywords: *Malaria; COVID-19; Hydro-oxy chloro quinine; Infection*

Introduction

The COVID-19 pandemic is testing the resilience of robust health systems around the world. Recognizing the heavy toll that malaria exacts on vulnerable populations in sub-Saharan Africa, as well as the region's fragile health infrastructure, WHO underlines the critical importance of sustaining efforts to prevent, detect and treat malaria. As COVID-19 continues its rapid spread, WHO would like to send a clear message to malaria affected countries in Africa, said Dr Pedro Alonso, director of the WHO global malaria programme. Do not scale back your planned malaria prevention, diagnostic and treatment activities. If someone living in a place with malaria develops a fever, he or she should seek diagnosis and care as soon as possible [1]. Ensuring access to core malaria prevention measures is an important strategy for reducing the strain on health systems; these include vector control measures, such as insecticide treated nets and indoor residual spraying as well as chemoprevention for pregnant women and young children (intermittent preventive treatment in pregnancy intermittent preventive treatment in infants and seasonal malaria chemoprevention). Additional special measures could ease the burden on health systems in the context of COVID 19, such as presumptive malaria treatment and mass drug administration [2].

Description

Any interventions must consider the importance of both lowering malaria related mortality and ensuring the safety of communities and health workers. WHO will provide guidance for to safely maintain essential health services in the context of the COVID-19 response [3].

About COVID-19

COVID 19 is the infectious caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. Essential information on the COVID 19 pandemic can be found in a dedicated WHO site [4].

About malaria

Malaria is a preventable and treatable disease caused by parasites that are transmitted to people through the bites of infected female anopheles mosquitoes. In 2018, there were an estimated 228 million cases of malaria worldwide and 405 000 malaria-related deaths. According to the WHO report on malaria (WHO-2014), death of thousands of children particularly in African countries is alarming. It is known malaria is caused mainly by *Plasmodium vivax*, *Plasmodium falciparum* and *Plasmodium malariae*, transmitted through female anopheles mosquito. Historical developments in the treatment of malaria started from extraction of quinine from the bark of cinchona in the year 1820. In 1880, French army doctor, Charles Louis Alphonse Laveran observed parasites in red blood cells of people suffering from malaria and the protozoan was identified in 1890 as Plasmodium by Italian scientists, Ettore Marchiafava and Angelo Celli. A year later, Carlos Finely, a Cuban doctor first suggested that mosquitoes were transmitting disease to and from human. In 1898, Sir Ronald Ross working in India proved that malaria indeed is transmitted by mosquitoes, for which he received the 1902 Nobel prize in medicine [5].

A medical board headed by Walter Reed further confirmed the findings of Finely and Ross in 1900. Quinine is one of the oldest and well known drugs for malaria, discovered in Peru and its derivatives like amodiaquine, mefloquine, primaquine are still used in the prevention and treatment of malaria. These class of drug act on the food vacuoles of the parasites. Parasites obtain amino acids for protein translation and formation of their cell membrane from digestion of hemoglobin in the host. The undigested free toxic heme groups form reactive oxygen species. The natural process of removing this toxic heme group from the parasitic cell is by the process of bio crystallization of heme to haemozoin. The chloro quinine inhibits this process of removal of toxic heme groups from parasitic cells and thus kills parasites. Admittedly, quinine or chloro quinine drugs have been replaced by atovaquone, a modern generation of drugs for treatment of malaria. It is interesting that only trans atovaquone is effective as a malarial drug its cis isomer is not a malarial drug. It is more interesting that the malarial drug chloro quinine or hydro oxy chloro quinine are using as drug in treatment of COVID-19. It is a fact that scientists have yet to find out a vaccine or proper medicine to fight against COVID-19. But it is known that SARS corona virus (out bust in 2002) was exhaustively studied by Nicol and his group and based on their study they have recommended that SARS can be treated with chloro quinine or better hydroxy-chloro quinine as was published in 2005 in virology journal.

Conclusion

We have mentioned that drugs are highly specific like same compound (atovaquone) its trans isomeric form is a effective malarial drug but its cis isomeric form is not a drug, likewise a drug (hydro-oxy chloro quinine), effective for corona virus SARS may not be that effective for COVID-19. Drug action of hydro-oxy chloro quinine on COVID-19 is not clearly known and requires further studies. Hypothesis of blocking of ACE2 receptor by hydro-oxy chloro quinine is yet to be confirmed.

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