



REVIEW ON CONTROL OF COVID-19 USING AN ANTIMALARIAL FIRST LINE DRUG

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ABSTRACT

A novel human virus called coronavirus, SARS-CoV-2, or COVID-19, has become a pandemic disease. It was started last week of November 2019 in Wuhan, a city in China. It causes severe respiratory tract infections and other diseases. It is transmitted from human to human within incubation times between two to ten days. It is spread via droplets, contaminated hands, or surfaces. Recently research concluded the new SARS-Cov-2 coronavirus.

Main body: More than 200 countries throughout the world have become suffered from malaria, and every year a large number of people die by the cause of malaria. We observed that there was no significant effect of coronavirus, SARS-CoV-2, or COVID-19 on malaria-affected countries. As per the recommendation given by World Health Organization, Artemisinin and its derivatives like Dihydroartemisinin, Artemether, Arteether, and Artesunate are used to kill parasites at an early phase of their development, quickly decreasing their numbers. Among all derivatives, Artesunate has the activity against HIV virus, and HIV virus has some structural similarity with coronavirus SARS-Cov-2 as both are RNA-based virus. There is a possibility for using Artesunate in malaria-infected countries; the coronavirus SARS-Cov-2 is unable to show a significant impact on malaria-affected countries.

KEYWORDS: Dihydroartemisinin, Artemether, Arteether, and Artesunate.

INTRODUCTION

Coronaviruses belong in the genus of the Coronaviridae family. These are enveloped viruses with a large plus-strand RNA genome. The genomic RNA is 27-32 kb in size, capped, and polyadenylated. There are three serologically distinct groups of Coronavirus. Within each group, viruses are characterized by their host range and genome sequence. Coronaviruses have been identified in mice, rats, chickens, turkeys, swine, dogs, cats, rabbits, horses, cattle, and humans and can cause a variety of severe diseases, including gastroenteritis and respiratory tract diseases. The family, Coronaviridae is comprised of two genera, Coronavirus, and Torovirus, which share similarities in morphology, genome organization, and genome expression.^[1,5] Recently one human Coronavirus named COVID-19 has been identified. Its complete onset of action is still unknown, but this Coronavirus also causes life-threatening pneumonia along with other diseases. The SARS-CoV-2 is a B-coronavirus, which is enveloped non-segmented positive-sense RNA virus (subgenus arbovirus, Orthocoronavirinae subfamily). Human Beta- coronavirus, i.e., SARS-CoV-2, SARS-CoV, and MARS-CoV, have many similarities but also have differences in their genomic and phenotypic structure that can influence their pathogenesis. COVID-19 contains a single standard (positive-sense) RNA

associated with a nucleoprotein within a capsid comprised of matrix protein. A typical CoV contains at least six ORFs in its genome. All the structural and accessory proteins are translated from the sgRNAs of CoVs.^[7]

Prevention and Control

WHO has recommended some methods and criteria which were used to prevent the spread of COVID-19 contamination? The first one is people should wash their hands recurrently with soap or alcohol-based hand rub. Everyone should keep a 1- meter gap between themselves and others who are coughing or sneezing. It is better to avoid touching the face with a hand. People should cover their mouth and nose when coughing or sneezing. People should stay at home if they feel unwell. Smokers should abstain from all forms of smoking as well as other lung damaging activities. Everyone should keep a short physical gap between themselves and others.^[19-22]

Main Text

We have selected some malaria-affected countries and malaria-free countries as tests and standard control for our experiment. We have selected the top 23 malaria-affected countries that are suffering from malaria (mainly

caused by *Plasmodium falciparum*) as per WHO. We have selected these countries as our test sample²⁷. In these countries, Artemisinin and its derivative Artesunate are used as a first-line medicine recommended by World Health Organization (WHO). It is also clear that Artemisinin and its derivative Artesunate are mainly used against *Falciparum malaria*.^[23-27]

This Artesunate has the anti-viral property, and it has activity against the HIV virus. 28 We also have selected eight malaria-free countries certified by WHO as our control sample. As these countries are completely free from malaria, any kind of antimalarial drugs are not used here. 29 Table 1 contains the name of the top 23 malaria-affected countries declared by WHO. Except in India, COVID-19 infected cases are very few in all countries. India has been suffering little high malaria-infected patients (24530) because of its high population. Except in India, total death caused by COVID-19 is also very low. In India, it is 780. Total COVID-19 infected cause per 1 million population and the total number of deaths per 1 million population are also very less. Even in India, these values are only 780 and 0.6, respectively. Table 2 contains the name of 8 completely malaria-free countries certified by WHO. We have considered table 2 as our controlled sample. The total number of COVID-19 infected causes, number of COVID-19 infected patients present per 1 million population, the total number of deaths caused by COVID-19, and the total number of deaths caused by COVID-19 per 1 million population are very high. Only Timor-Leste does not suffer any deathcase caused by COVID-19. The total number of COVID-19 infected patients in El Salvador and Uzbekistan is also low because of the low population. All data were collected on 18th April 2020 from world meter.^[30]



CONCLUSION

Our work focuses on the new area of the treatment of Patients caused by coronavirus, COVID-19. We suggested to use of Artesunate along with Zinc as a supporting element for the treatment of coronavirus; Artesunate is a well-known and widely used first-line drug used to treat malaria caused by *Plasmodium falciparum*, which is quite frequent in malaria-affected

nations, particularly in Africa. We have observed that there is less coronavirus activity in malaria burden countries, especially those are affected by *Plasmodium falciparum*. Zinc is an essential element, and it is used to increase the immunology against virus infections, Especially those that infect the respiratory tract. So, a combination therapy, i.e., Artesunate and Zinc, will be better to fight against coronavirus, COVID-19. We have suggested using combination of Artesunate and Zinc as prophylaxis treatment against coronavirus, COVID-19.

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