Contentious COVID-19 Drugs Are All Antimalarial: May Not Be a Coincidence

Description

The COVID-19 recommendations hydroxychloroquine, ivermectin, and now artemisinin all have one thing in common: They are antimalarial drugs or have such properties.

Yet studies suggest that this may not be a mere coincidence; malaria and COVID-19 may be more similar than people may realize.

Malaria Versus COVID-19

From the outset, malaria and COVID-19 are very distinct diseases.

Malaria is a parasitic disease. An infection starts when an individual is bitten by a mosquito carrying a parasite from the Plasmodium genus. Upon infection, the parasite first goes to the liver and multiplies in liver cells. Then it migrates to the bloodstream, invades and proliferates in red blood cells, and causes these cells to expand and burst.

Common malaria symptoms such as fever, chills, and sweating occur during the blood-stage infection. Complications include anemia, and on rare occasions, cerebral malaria, liver failure, fluid buildup in the lungs, and acute respiratory distress syndrome.

COVID-19, on the other hand, is a viral disease. Infection occurs primarily through the inhalation of contaminated droplets. The virus invades the body through the nasal cavities, entering the upper and then lower respiratory tracts.

Inflammation of the lungs ensues as the body’s immune cells fight off the infection. The person’s oxygen levels start dropping as inflammation worsens in the advent of a cytokine storm, and the lungs become damaged. Some of the virus can also go into the bloodstream and invade other organs, causing systemic inflammation and damage.

Several Commonalities

While one mainly affects blood cells and the other primarily affects the lungs, both diseases are characterized by a strong inflammatory response early in the infection, according to a 2022 paper in Frontiers in Immunology.

Symptoms-wise, both infections from malaria and COVID-19 can lead to fever, fatigue, shortness of breath, diarrhea, and muscle pain.

If inflammation is prolonged, the body will experience a significant increase in cytokines, and individuals can become severely injured or even die.

The two diseases are also similar in that they both sequester iron, use the same receptors in their pathogenesis, and even share similar structures in their proteins.

Iron Storage

Both the Plasmodium parasite and the SARS-CoV-2 virus require iron to proliferate. Therefore, both the parasite and the virus need to store iron inside the ferritin protein within infected cells. High or increased levels of ferritin are therefore an indication of severe disease and inflammation.

Drugs that are capable of targeting iron storage or preventing proliferation may therefore be successful in treating both malaria and COVID-19.

Similar Receptors

The angiotensin-converting enzyme 2 (ACE-2) receptor is involved in both malaria and COVID-19 infections.

In COVID-19, the virus binds to ACE-2 to invade cells. ACE-2 is ubiquitous within the human body, present within at the very least:

- Lungs
- Blood vessels
- Muscles
- The gut
- Nerves
- Stomach
- Heart
- Kidneys
- Pancreas
- Testes
- Uterus

Organs that have a high number of ACE-2 receptors are therefore at a higher risk of COVID-19 infection.

The significance of ACE-2 in malaria is uncertain. However, one study, as well as the one published in Frontiers in Immunology, showed that people who have their ACE-2 receptors reduced due to genetic predispositions are more resistant to malaria.

According to the Frontiers in Immunology study, malaria parasites use the CD147 receptors on red blood cells to gain entry into the cell. The COVID-19 virus also uses CD147 in the absence of ACE-2 receptors. CD147 has also been linked to the formation of blood clots in COVID-19 infections.

Therapeutics that can target CD147 and ACE-2 may be successful in treating both malaria and COVID-19.

Similar Protein Structures

Additionally, both pathogens share a degree of overlap in their protein structures. The COVID-19 surface N protein has at least 40 percent structural similarity with important malarial proteins in charge of transport, attachment, and invasion.

This means that drugs that can target malarial proteins may also be able to target SARS-CoV-2 viral proteins.

Antimalarial Drugs Used in COVID-19

Early in the pandemic, many studies recommended antimalarial and anti-parasitic drugs such as hydroxychloroquine, chloroquine, ivermectin, and artemisinin as potential treatment options for COVID-19. These recommendations, however, soon received backlash, with one reason being that malaria and COVID-19 seem to be very different diseases.

But many doctors and studies found these therapeutics helpful in treating acute COVID-19. Professor Jose Luis Abreu, whose specialty is in plant science at The State University of Nuevo León, used the proposition of “parallelism between malaria and COVID-19” as an explanation for why antimalarial drugs such as ivermectin, artemisinin, and hydroxychloroquine may be applied to COVID-19 in his protocol.

Have Potent Anti-Inflammatory Properties

Hydroxychloroquine, chloroquine, ivermectin, and artemisinin are all very potent anti-inflammatory drugs.

According to a study published in The Journal of Antibiotics, ivermectin is an immunomodulator in COVID-19, meaning that it does not suppress the immune system, but regulates it so that it does not become hyperinflammatory and damaging.

Hydroxychloroquine and artemisinin have similarly been shown to have immunomodulating effects.

Hydroxychloroquine is also approved to treat autoimmune diseases such as rheumatoid arthritis and lupus (pdf).

Studies like the one in The Journal of Antibiotics have shown that ivermectin, hydroxychloroquine, and artemisinin may be able to prevent cytokine storms and scarring of the lungs. Abreu has pointed out that artemisinin, due to its reaction with iron molecules, can also produce oxygen as an end product, helping to alleviate hypoxic conditions.

As aforementioned, COVID-19 infections have also been associated with iron sequestration for viral proliferation. Abreu argued that artemisinin, whose primary role in malaria is to target iron storage by releasing free radicals, would also do the same in COVID-19-infected areas and kill infected cells and viruses.

Block COVID-19 Receptors and Proteins

In simulation studies, ivermectin, hydroxychloroquine, and artemisinin can bind to SARS-CoV-2 N proteins, which have structural similarities with malaria proteins. In treating malaria, hydroxychloroquine and artemisinin have been shown to block malarial proteins from replicating and proliferating.

All three drugs can also bind to CD147 and ACE-2 receptors, as previously reported by The Epoch Times. These drugs can also bind to COVID-19 spike proteins directly to prevent viral attachment to cell receptors and also prevent viral proliferation by blocking proteins that take part in viral replication.

Meplazumab, an antibody that has been approved for use in malarial treatment for its anti-CD147 activity, has also been beneficial in treating COVID-19 pneumonia.

Antimalarial Drugs Are Also Anti-Cancer?

Ivermectin, artemisinin, and hydroxychloroquine have also been found to have anti-cancer properties.

It is interesting to note that some studies have also postulated that cancer acts like a parasite. Like external parasites, cancer depends on its host—the human body—for food, but operates independently and often to the detriment of the host.

Abreu said that a common feature among malaria, cancer, and COVID-19 is that all of them require iron for proliferation, and therefore, artemisinin has been used with success in preventing malaria, cancer, and COVID-19.

Abreu wonders if there is a link between parasites, viruses, and cancer, saying that further studies should be done on these matters.

Ivermectin has been found to prevent cancer cell proliferation and metastasis, and also encourage cancer cell deaths in several types of cancers. It can also prevent the formation of blood vessels, which cancer cells need for deriving oxygen and nutrients.

Hydroxychloroquine and chloroquine can also prevent blood vessel formation and autophagy. Autophagy is a process that removes waste from the body, then reuses and recycles cell content. The

process is a double-edged sword, and in some cases can improve the survivability of cancer cells, hence why autophagy inhibitors can also prevent further cancer development.

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