

Chloroquine to fight COVID-19: A consideration of mechanisms and adverse effects?

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Abstract

The COVID-19 outbreak emerged in December 2019 and has rapidly become a global pandemic. A great deal of effort has been made to find effective drugs against this disease. Chloroquine (CQ) and hydroxychloroquine (HCQ) have demonstrated great promise in treating COVID-19. CQ/HCQ have been used to prevent and treat malaria and are efficacious anti-inflammatory agents in rheumatoid arthritis and systemic lupus erythematosus. These drugs have potential broad-spectrum antiviral properties, and have been widely adopted for COVID-19 treatment and clinical trials. In this review, we re-evaluated the treatment outcomes and current hypothesis for the working mechanism of CQ/HCQ as COVID-19 therapy with a special focus on disruption of Ca²⁺ pathways. The potential toxicity is also cautioned for its action on Ca²⁺ and hyperpolarization-activated cyclic nucleotide-gated channels in cardiac myocytes and neuronal cells. We propose that intracellular calcium homeostasis is an alternative mechanism for CQ/HCQ pharmacology, which should be considered when evaluating the risks and benefits of therapy in these patients.

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