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The Pursuit of Coronavirus Drugs: A Glimpse into Antiviral Treatments

Kuribayashi Shiko*

Department of Pharmaceutical Biosciences, University of Helsinki, 00014 University of Helsinki, Finland

Introduction

One approach to fast-track drug development is repurposing existing medications. Researchers have tested a range of drugs used for other viral infections, such as remdesivir, originally designed for Ebola, and the antimalarial drug hydroxychloroquine. While some showed promise, further research has clarified their effectiveness. Monoclonal antibodies are laboratory-made proteins that mimic the immune system's ability to fight off harmful pathogens. Several monoclonal antibody treatments, like REGN-COV2 and bamlanivimab/etesevimab, have been authorized for emergency use to treat COVID-19 patients. Some drugs, such as lopinavir and ritonavir, inhibit viral proteases that are essential for viral replication. However, clinical trials have not shown clear benefits, and their use has been limited. Scientists have explored the use of RNA-based therapies, such as small interfering RNA (siRNA) and Antisense Oligonucleotides (ASOs), to target and inhibit the virus's genetic material. These therapies have shown potential in preclinical studies [1].

Description

The emergence of the novel coronavirus, SARS-CoV-2, in late 2019 led to a global pandemic, prompting an urgent need for effective treatments. As the world grappled with the devastating impacts of COVID-19, scientists and researchers across the globe mobilized to develop and repurpose drugs to combat the virus. This article explores the ongoing quest for coronavirus drugs, shedding light on the strategies, challenges, and promising candidates in the battle against this global threat. Coronaviruses mutate, leading to the emergence of new variants. Drug development must account for these mutations to remain effective. Rigorous clinical trials are necessary to ensure a drug's safety and efficacy. These trials take time, and not all drugs that show promise in the lab perform well in human studies. Scaling up production and ensuring equitable distribution of effective drugs, especially in developing countries, can be a logistical challenge. COVID-19 affects patients differently, and a one-size-fits-all drug may not be feasible. Tailoring treatments to individual patient profiles is a growing area of research [2,3].

This antiviral medication was one of the first drugs authorized for emergency use to treat COVID-19. It works by interfering with the virus's ability to replicate. Clinical trials have provided mixed results regarding its efficacy. This is a corticosteroid used to reduce inflammation and has been found to be effective in reducing mortality in severe cases of COVID-19. It is often used in hospitalized patients who require supplemental oxygen or mechanical ventilation. Monoclonal antibody therapies, such as casirivimab/imdevimab and bamlanivimab/etesevimab, have been authorized for emergency use. They are used to treat mild to moderate cases of COVID-19 and are most effective when administered early in the course of the disease. Convalescent plasma therapy involves using the plasma from recovered COVID-19 patients, which contains antibodies against the virus, to treat infected individuals. Its efficacy is still a subject of research. Ivermectin is an antiparasitic drug that gained attention as a potential COVID-19 treatment. However, its efficacy and safety for COVID-19 were under debate, and more research was needed [4,5].

Conclusion

This oral antiviral drug, developed by Merck and Ridgeback Biotherapeutics, is designed to stop the replication of the SARS-CoV-2 virus. It showed significant efficacy in reducing the risk of hospitalization or death in clinical trials. A combination of nirmatrelvir and ritonavir, which inhibits viral proteases, in combination with molnupiravir, has shown promise as a treatment for COVID-19. Convalescent plasma, which contains antibodies from recovered COVID-19 patients, has been used to treat severe cases. It remains an important therapeutic option. The search for effective coronavirus drugs continues, with researchers working tirelessly to find treatments that can mitigate the impact of the ongoing pandemic. While challenges persist, the development and repurposing of drugs, coupled with advances in understanding the virus and its variants, provide hope that more effective treatments will emerge. As science and medicine continue to evolve, the battle against COVID-19 remains a top priority, highlighting the importance of global collaboration and innovation in the fight against infectious diseases.

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***Address for Correspondence:** Kuribayashi Shiko, Department of Pharmaceutical Biosciences, University of Helsinki, 00014 University of Helsinki, Finland, E-mail: shiko321@gmail.com*

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