COVID19' da tedavi yöntemleri

Treatment modalities in COVID 19

Rafiye ÇİFTÇİLER[1]*, Ali Erdinç ÇİFTÇİLER[2]

[1]Aksaray University Training and Research Hospital, Department of Hematology, Aksaray /TÜRKİYE

[2]Ortakoy State Hospital, Department of General Surgery, Aksaray /TÜRKİYE

ABSTRACT

The new SARS-CoV-2 virus continues to spread rapidly around the world. As the world struggles to minimize the transmission of this devastating disease, various strategies and interventions are actively being implemented to improve treatment. Pharmaceutical companies and academic researchers are working relentlessly to search for experimental, fit-for-purpose, or FDA-approved drugs for SARS-CoV-2 prophylaxis and treatment. This review provides an overview of the current therapeutic modalities being evaluated against the SARS-CoV-2 virus.

INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) outbreak occurred in the world in December 2019. It has become an internationally important public health emergency with an average mortality rate of about 4%. As of November 29th, 2020, a total of more than 60 million confirmed cases of COVID-19 had been reported worldwide and the number of cases continues to increase day by day (1). The epidemic not only affects the standard life of people, but also causes global economic problems. The development of drugs for the treatment of COVID-19 plays an important role for people all over the world. This article summarizes the research in the field of COVID-19 treatment.

Antiviral drugs inhibit all stages of virus replication (2). Antiviral drugs in clinical applications in the treatment of COVID 19: protease inhibitors, nucleic acid synthesis inhibitors, influenza virus drugs, and antimalarial drugs with antiviral activity. Favipiravir is a guanine analog that selectively inhibits RdRP of RNA viruses. Wang et al. reported inhibition of SARS-CoV-2 by favipiravir (3). Lopinavir/ritonavir is a specific drug for AIDS (HIV). Ritonavir inhibits CYP3A activity and may have a synergistic effect with lopinavir by increasing the concentration of Lopinavir (4). The impact of Lopinavir/ritonavir against COVID-19 remains to be verified in clinical trials. Darunavir/cobicistat is a protease inhibitor. It prevents virus replication by inhibiting the division of polyproteins in virus-infected cells (5). Ribavirin is a nucleoside 1 analog and acts an antiviral role by inhibiting inosine-5-phosphate dehydrogenase and blocking the synthesis of viral RNA and DNA (6). Remdesivir was reported that it has activity against SARS-CoV-2 in cell test and animal model test. It may play a role in prevention when it is used before infection. Additionally, it can obviously relieve clinical symptoms taking it before the high incidence period of virus replication (7). Deng et al. reported that the combination of arbidol and lopinavir/ritonavir may be useful to delay the progression of lung disease and reduce the probability of respiratory and gastrointestinal transmission (8). Hydroxychloroquine and chloroquine are considered to be immunomodulators. Chloroquine has a role in both the entry stage and post-stage of the SARS-CoV-2 virus in Vero E6 cells (9). Hydroxychloroquine is thought to have the ability to inhibit the cytokine release syndrome caused by the overactivation of the immune system caused by SARS-CoV-2 infection.

The clinical usage of glucocorticoid in the treatment of COVID-19 is mainly due to its anti-inflammatory effect. However high dose glucocorticoids can cause immunosuppression, therefore it is suggested to usage low-dosage glucocorticoids.

Immunopotentiators increase the immunity of the body by activating human immune cells, especially including transfer factors, interferon, and interleukin-2. When the virus infection has occurred, cells produce interferon. Thus, a large number of interferon-derived proteins prevent virus replication and create an antiviral effect (10). Convalescence plasma provides passive immunity. The use of convalescence plasma in COVID-19 treatment is also an alternative option (11). In patients with severe adult COVID-19, in addition to antiviral drugs, convalescent plasma was observed to be well tolerated with a 200 mL dose, which can significantly raise or maintain a high level of neutralizing antibody, improving viremia and other clinical indices (11). The management of the cytokine storm is a significant part of treating critically COVID 19 patients. Interleukin-6 (IL-6) plays a major role in cytokine release syndrome. Tocilizumab has been observed to be an effective drug for severe COVID-19 patients by effectively blocking the IL-6 signal transduction pathway (12). Current studies do not support the use of prophylactic antibiotics in COVID-19 patients in the absence of bacterial infection (13). However, it has been reported that when azithromycin is combined with hydroxychloroquine, the viral load is significantly reduced in COVID-19 patients and as a result, azithromycin increases the activity of hydroxychloroquine (14). The COVID-19 vaccine may prevent recurrent and sustained epidemics of COVID-19, which would lead to greater benefits for all people. Since the full genome sequence of SARS-CoV-2 was discovered, there has been a global increase in vaccine development efforts against COVID-19 (15). In a previous publication, we reported that the hematopoietic effects of COVID-19/SARS viral infections, including lymphopenia, leukoerythroblastosis, and macrophage activation syndrome, may be linked to the viral effect on the local renin angiotensin system in the bone marrow microenvironment (16). The development of effective treatment options for COVID-19 requires the joint efforts of researchers from various countries and important recommendations from the World Health Organization.

CONFLICT of INTERESTS

The authors of this paper have no conflict of interests, including specific financial interests, relationships, and/or affiliations relevant to the subject matter or materials included.

References

1.Organization WH. Coronavirus (COVID-19). 2020. 2020.

2.Mishra E, Goyal AK, Rath G. Recent advances in drug delivery systems in antiviral therapy. 2018.

3.Wang M, Cao R, Zhang L, Yang X, Liu J, Xu M, et al. Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) in vitro. Cell Res. 2020;30(3):269-71.

4.Oldfield V, Plosker GL. Lopinavir/ritonavir. Drugs. 2006;66(9):1275-99.

5.Llibre JM. Development of darunavir over the entire spectrum of HIV infection. Enfermedades Infecciosas y Microbiologia Clinica.

Sorumlu Yazar: Rafiye ÇİFTÇİLER

İletişim Adresi: Aksaray Üniversitesi Eğitim ve Araştırma Hastanesi Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji Anabilim Dalı, Aksaray/Türkiye.

e-mail: rafiyesarigul@gmail.com

ORCID:-

HIV infection. Enfermedades Infecciosas y Microbiologia Clinica. 2018;36:3-9.

6.Khalili JS, Zhu H, Mak NSA, Yan Y, Zhu Y. Novel coronavirus treatment with ribavirin: Groundwork for an evaluation concerning COVID-19. Journal of medical virology. 2020.

7.Cao Y-c, Deng Q-x, Dai S-x. Remdesivir for severe acute respiratory syndrome coronavirus 2 causing COVID-19: An evaluation of the evidence. Travel Medicine and Infectious Disease. 2020:101647.

8.Deng L, Li C, Zeng Q, Liu X, Li X, Zhang H, et al. Arbidol combined with LPV/r versus LPV/r alone against Corona Virus Disease 2019: A retrospective cohort study. Journal of Infection. 2020.

9.Wang M, Cao R, Zhang L. Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019 nCoV) in vitro [published online February 4, 2020]. Cell Res doi.10.

10.Samuel CE. Antiviral actions of interferons. Clinical microbiology reviews. 2001;14(4):778-809.

11.Olivares-Gazca JC, Priesca-Marín JM, Ojeda-Laguna M, Garces-Eisele J, Soto-Olvera S, Palacios-Alonso A, et al. Infusion of convalescent plasma is associated with clinical improvement in critically ill patients with COVID-19: a pilot study. Rev Invest Clin. 2020;72(3):159-64.

12.Zhang C, Wu Z, Li J-W, Zhao H, Wang G-Q. The cytokine release syndrome (CRS) of severe COVID-19 and Interleukin-6 receptor (IL-6R) antagonist Tocilizumab may be the key to reduce the mortality. International journal of antimicrobial agents. 2020:105954.

13.Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. Jama. 2020;323(11):1061-9.

14.Philippe G, Jean C, Lagier P. P.; Van, TH; Line, M.; et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open label non-randomized clinical trial. Journal of Antimicrobial agents. 2020.

15.Wu SC. Progress and Concept for COVID-19 Vaccine Development. Biotechnology Journal. 2020.

16.Çiftçiler R, Haznedaroğlu İ C. COVID-19, Renin-Angiotensin System, and Hematopoiesis. Turk J Haematol. 2020;37(3):207-8.